



R. Wade Litchfield
Vice President & General Counsel
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408-0420
(561) 691-7101

FILED 7/14/2021
DOCUMENT NO. 07890-2021
FPSC - COMMISSION CLERK

July 14, 2021

VIA ELECTRONIC FILING

Adam Teitzman, Commission Clerk
Division of the Commission Clerk and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 20210015-EI
Petition by FPL for Base Rate Increase and Rate Unification

Dear Mr. Teitzman:

Attached for filing on behalf of Florida Power & Light Company ("FPL") in the above-referenced docket are the Rebuttal Testimony and Exhibit of FPL witness Dr. Steven R. Sim.

Please let me know if you should have any questions regarding this submission.

(Document 2 of 15)

Sincerely,

A handwritten signature in blue ink, appearing to read 'Wade Litchfield', is written over a light blue horizontal line.

R. Wade Litchfield
Vice President & General Counsel
Florida Power & Light Company

RWL:ec
Attachment
cc: Counsel of Record

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
FLORIDA POWER & LIGHT COMPANY
REBUTTAL TESTIMONY OF DR. STEVEN R. SIM
DOCKET NO. 20210015-EI
JULY 14, 2021

TABLE OF CONTENTS

1

2

3 **I. INTRODUCTION..... 3**

4 **II. REBUTTAL OF INTERVENOR ARGUMENTS 9**

5 **1) A brief overview of intervenor testimonies and the lack of resource**

6 **planning experience of the intervenor witnesses: 9**

7 **2) The intervenor witnesses’ efforts to oppose the proposed lowering of**

8 **CDR and CILC program incentive payments that are needed to return**

9 **these DSM programs to cost-effective status: 11**

10 **3) The intervenors’ inappropriate attempt to turn this docket into a DSM**

11 **goals proceeding: 29**

12 **4) The intervenors’ unhappiness with the results of FPL’s resource**

13 **planning analyses: 39**

14 **5) Problems in numerous other statements made by intervenor**

15 **witnesses: 55**

16 **III. CONCLUSIONS..... 61**

17

18

19

20

21

22

1 **I. INTRODUCTION**

2

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

4 A. My name is Steven R. Sim, and my business address is Florida Power & Light
5 Company (“FPL”), 700 Universe Boulevard, Juno Beach, Florida 33408.

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

7 A. Yes.

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

9 A. Yes. I am sponsoring the following exhibit that is attached to my rebuttal
10 testimony:

- 11 • Exhibit SRS-14: Inaccurate, Misleading, and/or Contradictory
12 Statements Made by Intervenor Witnesses.

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

14 A. My rebuttal testimony addresses a number of issues and problems found in the
15 testimonies of five (5) witnesses who have presented testimony on behalf of
16 intervening parties in this docket. These intervening parties and witnesses are
17 listed below (in no particular order): Florida Industrial Power Users Group
18 witness Pollock; Florida Retail Federation witness Georgis; Florida
19 Rising/League of United Latin American Citizens of Florida
20 (“LULAC”)/Environmental Confederation of Southwest Florida witness
21 Rábago; and CLEO Institute (“CLEO”)/Vote Solar witnesses Whited and
22 Wilson.

1 **Q. How is your rebuttal testimony structured?**

2 A. My rebuttal testimony is structured to address the five (5) topics identified
3 above in the table of contents. I then close my testimony with a few concluding
4 remarks.

5 **Q. Please provide a summary of your testimony.**

6 A. I will summarize the key points of my testimony in bullet format, first with an
7 overall view of the intervenor witnesses' testimonies, then with regard to
8 specific topics.

9

10 **An Overall View:**

- 11 • None of the intervenor witnesses I address in my rebuttal testimony has
12 ever been employed by a utility as a resource planner. Therefore, none
13 of the intervenor witnesses has had the opportunity, and the challenge,
14 of actually planning an electric system not only through their own work,
15 but through continual collaboration with utility system operators and
16 transmission planners to ensure that the resulting resource plan is one
17 that allows the utility system to be operated reliably under a myriad of
18 situations.
- 19 • The intervenors produced no modeling of the FPL, Gulf Power
20 Company ("Gulf"), and/or integrated FPL/Gulf systems upon which
21 they could have based their testimonies. Therefore, the only system
22 modeling analyses presented in this docket are those that FPL has
23 provided and supported in its testimonies.

- 1 • As a result, the intervenor testimonies amount to little more than
2 criticism of the results of FPL’s analyses because those results are not
3 the outcomes that the intervening parties desire, often for their own self-
4 interest.

5

6 **Specific Topics:**

- 7 • CDR and CILC Incentives:
- 8 - Not surprisingly, the witnesses for FIPUG and FRF are opposing
9 FPL’s proposed lowering of CDR and CILC incentives payments
10 needed to return the two demand side management (“DSM”)
11 programs to cost-effectiveness status.
- 12 - The misguided arguments these witnesses make in an attempt to
13 block the needed lowering of incentives include: (i) pretending these
14 two DSM programs are not DSM programs at all, but are just electric
15 rates; (ii) basing the incentives only on fixed cost of generation, not
16 on total costs of generation; (iii) basing the incentives on the cost of
17 generation that FPL has already built; and (iv) basing the incentives
18 on the cost of generation projected for another region of the country.
- 19
- 20 • Inappropriately attempting to turn this docket into a DSM goals
21 proceeding:
- 22 - The monthly incentive payment levels for CDR and CILC
23 participants is an appropriate issue for this docket as directed by the

1 Florida Public Service Commission (“FPSC”) in FPL’s most recent
2 (2020) DSM Plan proceeding (Docket No. 20200056-EG).

3 - However, discussion of other DSM-related issues is not appropriate
4 in this docket. FPL’s analyses that support its filing in this docket
5 followed the FPSC’s 2019 DSM Goals order which was based, at
6 least in part, on the fact that the cost-effectiveness of DSM is
7 declining to the point where many of FPL’s and Gulf’s DSM
8 programs are no longer cost-effective.

9 - Nevertheless, several of the intervening witnesses appear to be using
10 this docket to continue their opposition to the FPSC’s decisions in
11 the 2019 DSM Goals docket, and by trying to ignore the steady
12 decline of DSM cost-effectiveness (a fact they do not dispute in their
13 testimonies).

14 - They do so by again bringing up DSM-related issues raised in the
15 2019 DSM Goals docket (and in prior DSM Goals dockets), even
16 though the FPSC has rejected these items repeatedly in DSM Goals
17 dockets.

18

19 • Unhappiness with the Results of FPL’s Resource Planning Analyses:

20 - The intervening parties are unhappy that the resource plan FPL has
21 developed – after extensive modeling and consultation with system

- 1 operations and transmission planning personnel – does not consist
2 solely of the resource options they favor.
- 3 - For example, they are unhappy that a few gas-fueled resources were
4 selected. They appear particularly unhappy that natural gas-fueled
5 combustion turbines (“CTs”) were selected in the resource plan for
6 the Gulf area (despite the fact that the CTs were selected based on
7 system economics and strongly supported by system operations and
8 reliability considerations). They choose to ignore that the Gulf
9 system (approximately 3,000 MW) has only an extremely small (44
10 MW) fast start generation capability, and even these few resources
11 are scheduled to be retired soon. Consequently, once Gulf is no
12 longer part of the Southern Company system, the Gulf area
13 definitely needs new fast start generation that is capable of operating
14 more than a few hours at a time.
- 15 - In short, the intervenors appear not to understand – or choose not to
16 accept – the fact that sound resource planning is not solely an
17 economic analysis, but rather must account for the ability to operate
18 the resulting utility system in a reliable manner.
- 19
- 20 • Numerous Inaccurate, Misleading, and/or Contradictory Statements:
- 21 - All of the witnesses whose testimonies I address here made
22 statements that are clearly inaccurate, misleading, and/or
23 contradictory. A listing of many of these misguided statements

1 appears in Exhibit SRS-14. Some of these statements are
2 egregiously bad.

- 3 - One example is a claim that FPL’s resource planning process is
4 “*biased*” toward gas-fueled generation as CLEO/Vote Solar witness
5 Wilson alleges (Wilson, Page 8, Lines 6-7). This is clearly not the
6 case. As shown later in my testimony, a simple compilation of the
7 resource additions, upgrades, and retirements presented in my direct
8 testimony, and in the 2021 FPL/Gulf Ten Year Site Plan, shows that
9 the net resource changes through 2030 include (approximately)
10 10,000 MW of new solar, 1,100 additional MW of new batteries,
11 and a 100 MW reduction in total gas-fueled resources.
- 12 - The number, nature, and breadth of these misguided statements does
13 not allow one to have confidence in the testimony of these intervenor
14 witnesses.

15
16 Based on my review of their testimonies, the intervenor witnesses:

- 17 - Did not perform any modeling analyses of the FPL, Gulf, and/or integrated
18 FPL/Gulf systems to support their contentions and recommendations;
- 19 - Did attempt inappropriately to turn this docket into a DSM goals
20 proceeding; and,
- 21 - Did make many inaccurate, misleading, and/or contradictory statements in
22 their testimonies.

23

1 As a result, these witnesses and their testimony should have no credibility for
2 the purposes of this docket, and their recommendations should be rejected.

3

4 **II. REBUTTAL OF INTERVENOR ARGUMENTS**

5

6 **1) A brief overview of intervenor testimonies and the lack of resource planning**
7 **experience of the intervenor witnesses:**

8

9 **Q. Do these intervenors attempt to criticize FPL's resource planning**
10 **analyses?**

11 A. Yes.

12 **Q. Have you examined the summaries of the work experience that each of**
13 **these witnesses provided in their testimonies?**

14 A. Yes.

15 **Q. Do these summaries of work experience show that any of them have**
16 **actually been employed by an electric utility as a resource planner?**

17 A. No.

18 **Q. Is their lack of this experience important when considering their**
19 **testimonies?**

20 A. Yes. Planning a utility system must, among other requirements: maintain
21 reliable service, minimize electric rates, account for the current and projected
22 transmission system strengths and constraints, and ensure that the resulting
23 utility system can be successfully operated by the system operators under a

1 myriad of potential situations and circumstances. Thus, it is a collaborative task
2 that requires ongoing interaction with many other business units of the utility.
3 For those reasons, it is a task that one cannot truly understand how to perform
4 solely from reading or writing papers, or even running models outside of
5 working in a utility. The intervenor witnesses do not have the requisite
6 experience to fully understand how a utility system is actually planned.

7 **Q. Do these intervenor witness testimonies provide any modeling analyses of**
8 **the FPL, Gulf, or FPL/Gulf integrated systems?**

9 A. No.

10 **Q. In short, the intervenors attempt to criticize FPL's resource planning**
11 **analyses, but have not performed any modeling analyses of their own, nor**
12 **do they have the requisite experience to fully understand how a utility**
13 **system is actually planned. How should their testimonies be evaluated?**

14 A. I believe that anyone evaluating the testimony presented in this docket should
15 put appropriate weight on: the depth and collaborative experience of the
16 individuals supplying testimony, whether the individuals performed any
17 modeling analyses of the FPL, Gulf, and/or FPL/Gulf systems, and the
18 objectives of the testimony. Accordingly, one should appropriately discount the
19 testimony of individuals who do not have the requisite experience, have not
20 performed modeling analyses for the FPL, Gulf, and/or FPL/Gulf integrated
21 systems, and whose testimony amounts to unfounded criticisms based on their
22 favored resources.

1 **Q. Do you believe that these witnesses' lack of requisite work experience has**
2 **led them to make inaccurate, misleading, and/or contradictory statements**
3 **in their testimonies?**

4 A. Yes. Exhibit SRS-14 presents a compilation of some of those problematic
5 statements, and the remaining sections of my rebuttal testimony will examine a
6 few of those statements.

7
8 **2) The intervenor witnesses' efforts to oppose the proposed lowering of CDR**
9 **and CILC program incentive payments that are needed to return these DSM**
10 **programs to cost-effective status:**

11
12 **Q. Which of the intervenor witness testimonies will you be addressing in this**
13 **section of your rebuttal testimony?**

14 A. In regard to comments made about the CDR and CILC programs, and FPL's
15 proposed lowering of the monthly incentive payments, I will examine the
16 testimonies of witnesses Pollock, Georgis, and Rábago.

17
18 I will start with a statement from witness Pollock in which he attempts to
19 explain an earlier statement of his that (paraphrasing) 'FPL's cost-effectiveness
20 analysis of the CDR and CILC programs is not valid'. Witness Pollock argues
21 that CDR and CILC should be viewed as simply electric rates, not as DSM
22 programs. (Page 60, lines 9-11)

1 **Q. Are the CDR and CILC programs DSM programs?**

2 A. Yes. They were designed as DSM programs, approved by the FPSC as DSM
3 programs, and have been evaluated as DSM programs in DSM Goals and DSM
4 Plan dockets since their inception.¹ Furthermore, utility costs, such as
5 administrative costs and incentive payments, for these programs have been
6 recovered under the Energy Conservation Cost Recovery (“ECCR”) clause as
7 they are for other DSM programs.

8

9 Each of these two DSM programs does have a tariff sheet associated with the
10 program. However, the tariff sheets primarily serve to explain program
11 eligibility, terms, conditions, and how the monthly incentives will be
12 distributed. As such, the tariffs are simply one facet of the DSM programs.
13 FPL’s residential and small business load management DSM programs are
14 similarly structured.

15 **Q. What is the importance of CDR and CILC being DSM programs?**

16 A. Because CDR and CILC are DSM programs, they are DSM resource options
17 that compete with other DSM options, and with supply options, for a role in
18 FPL’s resource plan. And, as explained in my direct testimony, DSM programs
19 are periodically evaluated to ensure that they remain cost-effective.

¹ The CILC program was closed to new participants in 2000 and, therefore, has not been addressed in DSM Goals or DSM Plan dockets since that date.

1 **Q. What does intervenor witness Pollock say about how the cost-effectiveness**
2 **of these DSM programs should be evaluated?**

3 A. Witness Pollock attempts to make several points to support his view about how
4 cost-effectiveness evaluations of these DSM programs are carried out. I will
5 paraphrase his contentions as follows:

6 - The FPSC has always used avoided capital costs only in determining the
7 cost-effectiveness of load management DSM programs. (Page 8, lines 33-
8 35);

9 - The value of load management programs can be judged by whether they
10 have actually avoided generation in the past, and by the costs of that past
11 avoided generation. (Page 61, lines 6-9); and,

12 - FPL's AURORA model accounts for both fixed and variable cost impacts
13 on a utility system, and variable costs impacts are not needed to evaluate
14 the cost-effectiveness of the CDR and CILC programs. (Page 63, lines 4-
15 10).

16 **Q. Do you agree with witness Pollock's contentions and his view of how cost-**
17 **effectiveness of DSM programs is evaluated?**

18 A. No. Witness Pollock does not understand, or simply ignores, how cost-
19 effectiveness analyses of DSM programs are actually performed in Florida.

20 **Q. How do the FPSC and FPL evaluate the cost-effectiveness of DSM**
21 **programs?**

22 A. To provide a direct comparison with witness Pollock's statements, I'll
23 summarize the actual DSM evaluation approach as having two key facets. First,

1 the evaluation of DSM programs is typically performed by: (i) examining future
2 changes in the utility's resource plan that could potentially result from the DSM
3 option, and (ii) in the course of that examination, accounting for all readily
4 quantifiable fixed and variable cost impacts on the utility system caused by the
5 DSM option that will be reflected in the electric rates with which all customers
6 will be served. Second, the DSM cost-effectiveness approach is not, as witness
7 Pollock's statements would have one believe, a "look back" at whether a DSM
8 program avoided/deferred another resource option in the past; nor is it an
9 examination of fixed costs only.

10 **Q. How long has this approach been used by the FPSC and FPL to analyze**
11 **DSM?**

12 A. The basic cost-effectiveness analysis approach has been utilized in Florida, and
13 elsewhere, since at least the early 1980s. It is a fundamentally sound approach
14 to determine whether DSM programs are beneficial to a utility's general body
15 of customers. By the fact that the DSM analytical approach accounts for all cost
16 impacts that will be reflected in electric rates, this approach is identical to how
17 generation resource options are analyzed. FPL, and other Florida utilities, have
18 filed hundreds, if not thousands, of DSM cost-effectiveness analyses over the
19 years using the FPSC's approved cost-effectiveness methodology. That
20 methodology provides a projection of cost impacts, including both fixed and
21 variable costs, that would result from a DSM option avoiding or deferring the
22 generation option that the utility would otherwise build. This information is
23 available in the applicable FPSC dockets.

1 **Q. Why is it important to realize that DSM cost-effectiveness analyses has**
2 **always accounted for both fixed and variable cost impacts on the utility**
3 **system?**

4 A. It is important to realize this in light of comments witness Pollock made
5 regarding the appropriateness of FPL using the AURORA optimization model
6 to analyze the value from both existing and new participants in the CDR and
7 CILC programs. Witness Pollock concludes that the AURORA model is the
8 wrong tool with which to measure DSM cost-effectiveness because it includes
9 both fixed and variable costs. This conclusion is clearly at odds with the fact
10 that, for years, DSM cost-effectiveness analyses, using the FPSC's approved
11 cost-effectiveness methodology, have accounted for both fixed and variable
12 costs.

13 **Q. Why was the AURORA model used in FPL's analysis of the CDR and**
14 **CILC programs?**

15 A. In my direct testimony, I described that the FPSC's approved cost-effectiveness
16 methodology was first used by FPL in its attempt to evaluate the cost-
17 effectiveness of the CDR program. The projected benefit-to-cost ratio for the
18 CDR program using the FPSC's approved methodology was 0.45.²

² A benefit-to-cost ratio of at least 1.0 is needed for a DSM program to be cost-effective. Thus, a benefit-to-cost ratio of 0.45 indicates that signing up new participants for the CDR program is clearly not cost-effective. Based on this ratio of 0.45, if FPL had stopped its analysis at this point, the result would have been a proposed monthly incentive payment much lower than the \$5.80/kW that FPL is proposing in this docket.

1 However, the FPSC’s approved cost-effectiveness methodology examines the
2 question of DSM cost-effectiveness solely from the perspective of signing up
3 new participants. The CILC program is closed to new participants but continues
4 to pay millions of dollars each year in on-going incentive payments to existing
5 participants. The CDR program does sign up new participants each year but has
6 many more existing participants for whom annual incentive payments are made.
7 The CDR program’s total annual incentive payments are also in the millions of
8 dollars. In order to address the cost-effectiveness of continuing to make
9 incentive payments to all of these existing program participants at the current
10 levels, another cost-effectiveness approach was needed.

11
12 The AURORA model is a resource planning optimization tool that FPL is
13 successfully using in its resource planning work. And, as already noted in
14 witness Pollock’s statements, the model accounts for both fixed cost and
15 variable cost impacts. In that regard, it is similar in overall concept to the
16 FPSC’s approved cost-effectiveness methodology.

17
18 When DSM levels in question are small (for example, only a few MW), it can
19 be difficult to accurately determine the impact of DSM in models such as
20 AURORA because those impacts are small in relation to the costs of the entire
21 utility system. However, in the case of the CDR and CILC programs, whose
22 combined MW capability exceeds 800 MW (*i.e.*, the size of a fairly large

1 generating unit), there is no problem in projecting the impacts of these programs
2 with a model such as AURORA.

3

4 FPL's analysis of the Manatee modernization project is a useful analogy. That
5 analysis was performed by a comparison of two resource plans – one plan with
6 the Manatee units remaining in service and the other plan assuming the Manatee
7 units are retired. With the 800+MW size of the combined CDR and CILC
8 capability, a similar approach using the AURORA model was utilized – a
9 comparison of two resource plans, one plan with the programs and other plan
10 assuming the programs are ended.

11

12 Therefore, FPL analyzed the cost-effectiveness of CDR and CILC using two
13 approaches. First, the FPSC's approved cost-effectiveness methodology was
14 used. Second, an AURORA model-based analysis was performed. Both
15 approaches account for fixed and variable costs, but the use of AURORA
16 allowed FPL to properly account for the costs and benefits from existing
17 program participants. In short, the use of the AURORA model was appropriate
18 and produced reliable results that I have included in my testimony and
19 recommendations.

20 **Q. What about witness Pollock's statement about whether the Commission**
21 **has used a production cost simulation model?**

22 A. Witness Pollock's statement that the FPSC has not used a production cost
23 simulation model to evaluate cost-effectiveness (Page 62, lines 9-11) may be

1 correct by default because, to my knowledge, the FPSC and its Staff do not run
2 production cost models. However, the FPSC's approved DSM cost-
3 effectiveness methodology does in fact simulate the impacts on the electric
4 system – accounting for both fixed and variable costs – that are obtained when
5 a model like AURORA is used. In addition, FPL has previously used production
6 cost models in at least the last two DSM Goals dockets (Docket No. 20130199-
7 EI and Docket No. 20190015-EG, respectively) to examine resource plans with
8 and without DSM portfolios. Finally, the FPSC frequently evaluates the results
9 from such models in resource planning dockets such as need determinations.
10 Thus, witness Pollock's contention is both misleading and misguided.

11 **Q. Didn't a couple of the intervenor witnesses claim that, based on fixed cost**
12 **avoidance, CDR credits should increase?**

13 A. Yes. Both witness Pollock and witness Georgis claimed, based on their
14 individual views of how DSM cost-effectiveness is evaluated, and using
15 different fixed costs, that CDR credits should actually be increased. (Pollock,
16 Page 66, lines 13-20 and Georgis, Page 19, lines 13-15).

17 **Q. Do you agree with these statements?**

18 A. No. There at least four things that are inherently wrong in the evaluation
19 approaches described in these statements. First, both witnesses are examining
20 fixed capacity costs only and ignoring other cost impacts, especially variable
21 costs, which are accounted for in DSM cost-effectiveness analyses.

1 Second, witness Pollock incorrectly attempts to use historical generation costs
2 to justify future incentive payment levels for the DSM programs. The correct
3 approach is to use projected future costs when contemplating future incentive
4 payments. Third, witness Georgis incorrectly bases his calculations on cost
5 projections from the SERC-SE region when he should be using FPL-specific
6 cost projections.

7
8 Fourth, witness Pollock's historical cost projections include types of generation
9 that are not the appropriate avoided unit for purposes of DSM analyses on FPL's
10 system and, therefore, are not used in FPL's DSM analyses.

11 **Q. What is the appropriate type of generating unit for purposes of FPL's DSM**
12 **analyses.**

13 A. For most of the last 20 years, the most cost-effective generation resource option
14 for FPL's system has been combined cycle ("CC") capacity. Therefore, for
15 purposes of FPL's DSM cost-effectiveness analyses, the appropriate avoided
16 unit has been FPL's next projected new, build-from-scratch (new) CC unit.

17 **Q. Why are CT units or CC/steam unit modernization projects not**
18 **appropriate for FPL as avoided units in DSM cost-effectiveness analyses?**

19 A. The CT units that FPL has added in the last few decades have either been needed
20 replacements for soon-to-be retired CT/GT capacity, or to address a need for
21 new fast start/longer duration capability in a specific region (*i.e.*, the Ft. Myers
22 CTs). Therefore, from a practical perspective, this capability cannot be avoided
23 by DSM.

1 In regard to modernization projects, these CC units have inherent advantages in
2 regard to land, water, transmission, and/or fuel supply infrastructure, compared
3 to new CC units. As a result, the CC units in modernization projects are more
4 economic than new CC units. FPL decided, in large part, not to use CC units in
5 modernization projects as avoided units in DSM cost-effectiveness analyses
6 because even less DSM would have been found to be cost-effective.³

7 **Q. Please discuss the new CC units FPL has recently used in its DSM analyses.**

8 A. In FPL's 2009 and 2014 DSM Goals filings, a projected new 2019 CC unit was
9 used as the avoided unit. In its 2019 DSM Goals filing, a projected new 2026
10 CC unit was used as the avoided unit.

11

12 Figure SRS-3 below provides a comparison of the projected \$/kW installed cost
13 of these CC units that were used in these DSM dockets.⁴ This figure shows that
14 the \$/kW installed costs for new CC units have significantly declined from 2009
15 to 2019.

³ The soon-to-be-completed Dania Beach modernization project marks the last modernization opportunity in FPL's area for the foreseeable future.

⁴ The figure formerly was previously provided in my direct testimony in the 2019 DSM Goals docket (Docket No. 20190015-EG) and the values represented in-service year dollars.

1

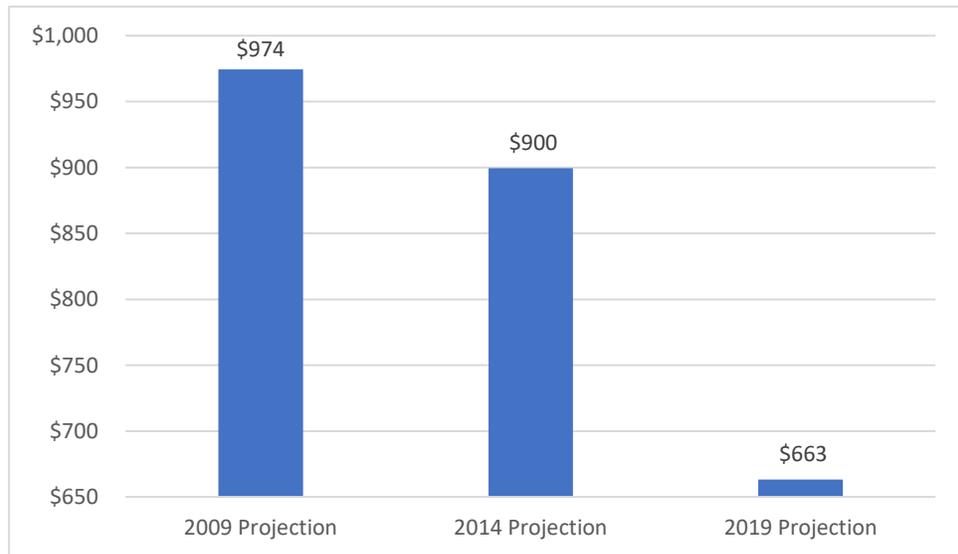
Figure SRS-3

2

Comparison of CC Installed Costs in DSM Analyses: 2009 to 2019

3

(\$/kW, in-service year)



4

5 **Q. Returning to witness Pollock’s testimony, his Exhibit JP-13 shows the**
 6 **actual \$/kW cost number of generating units/projects built by FPL during**
 7 **the period 2013 through 2020, plus projected costs for two additional**
 8 **units/projects that will come in-service in 2021 and 2022. Is the information**
 9 **regarding actual costs shown in his exhibit consistent with the declining**
 10 **cost trend shown above in Figure SRS-3?**

11 **A.** Yes, if his exhibit had covered two earlier years. In his exhibit, the only unit
 12 that meets FPL’s criterion of being a new CC unit – and not a modernization of
 13 an existing steam or CC unit, a CT/GT replacement project, or a solar project –
 14 is the 2019 Okeechobee CC unit. That unit is shown with a \$677/kW installed
 15 cost. Prior to the Okeechobee CC, FPL’s last new CC unit was the West County
 16 Clean Energy Unit 3 (“WCEC 3”) which came into service in 2011. The

1 installed cost for the WCEC 3 unit was \$709/kW in that year's dollars. This
2 unit does not appear in his exhibit because the exhibit did not address any year
3 prior to 2013.

4
5 To provide a more meaningful comparison of the installed costs of these two
6 units, one would need to compare them in the same year dollars. Applying a
7 2.5% annual escalation rate to the WCEC 3 cost to bring its cost up to 2019
8 dollars, results in an adjusted installed cost for WCEC 3 of \$864/kW. Thus, the
9 installed cost for the 2011 CC was approximately 28% ($864/677 = 1.28$) higher
10 than the cost of the 2019 Okeechobee CC in terms of same year dollars.
11 Therefore, this comparison of actual costs demonstrates that installed costs for
12 new CC capacity have been declining by a significant amount during the years
13 2011 through 2019.

14 **Q. Did witness Pollock have any other comments regarding a trend in**
15 **generation costs?**

16 A. Yes. He addresses historical costs of CT capacity in the Midcontinent
17 Independent System Operator ("MISO") area discussion of CT prices in the
18 MISO area as follows:

19
20 *"...I have provided a history of CONE prices published by MISO in its annual*
21 *PRA. The CONE prices shown reflect the cost to construct a new CT in MISO*
22 *local resource Zone 9, which includes Louisiana, Mississippi and Texas (along*
23 *the Gulf Coast). As can be seen, the CONE prices have varied over time.*

1 *However, there is no discernable decline...*. (Page 64, lines 17-19, and page
2 65, lines 1-2). (emphasis added)

3

4 For the purpose of examining his statement, I will ignore the fact that he appears
5 to be comparing prices for stand-alone CT units, not for new CC units. Although
6 witness Pollock does not indicate in this statement where these values “*can be*
7 *seen*” in his testimony, values for “*Capital Cost of New Combustion Turbines*”
8 from “*MISO PRA Filings (Louisiana, Mississippi, Texas)*” are shown in his
9 Exhibit JP-14, page 2 of 2. In that exhibit, he uses these cost values for the years
10 2013-2014 through 2019-2020 in a calculation. Those values are shown below
11 in Figure SRS-4:

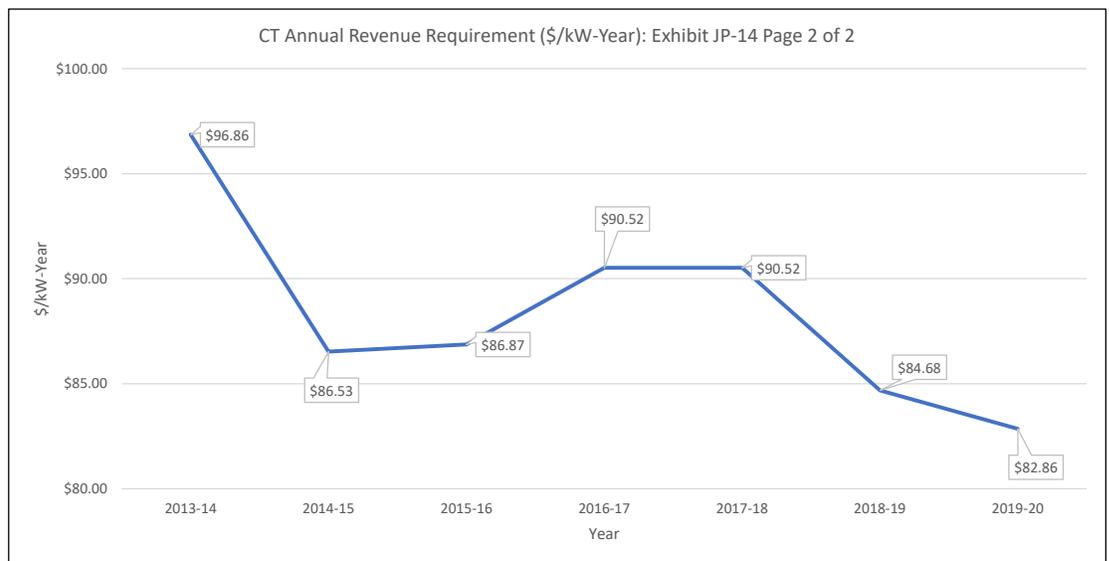
12

13

Figure SRS-4

14

Capital Cost of New CTs: MISO 2013-14 Through 2019-2020



15

1 Although witness Pollock describes these actual costs as showing “*no*
2 *discernable decline*”, it certainly seems to me that there is a distinct decline in
3 costs from the starting point value over this time period. This indicates that FPL
4 does not appear to have been alone in seeing a decline in generation capital
5 costs over the last decade.

6 **Q. Did witness Georgis attempt to describe his calculation approach as an**
7 **“FPL methodology”?**

8 A. Yes. He attempted to do so with the following two statements:

9
10 *“Q. Using Mr. Sim’s methodology, could these projections be applied to*
11 *calculate the CILC/CDR credit values in FPL’s calculation methodology?”*

12 (Page 18, lines 16-18) (emphasis added); and,

13
14 *“Applying FPL’s methodology of projected changes in costs and value for*
15 *capacity...”* (Page 19, line 13) (emphasis added).

16 **Q. Is this “FPL’s” or “your” methodology?**

17 A. Neither. As much as witness Georgis may wish it were so, FPL’s methodology
18 is definitely not to: (i) find some capacity-only cost projection that is not FPL-
19 specific, (ii) determine the year-to-year escalation factors from that projection,
20 and (iii) apply those escalation factors to the current, non-cost-effective CDR
21 incentive to increase the payment level (which would only make the non-cost-
22 effective CDR and CILC programs even less economic).

1 As previously described, FPL's approach in analyzing the appropriate incentive
2 levels for the CDR and CILC programs was to account for all fixed and variable
3 cost impacts from the programs in two separate and independent analyses. One
4 analysis used the FPSC's approved DSM cost-effectiveness methodology, and
5 the other used the AURORA model. Both analysis approaches found that the
6 programs are no longer cost-effective with their current incentive levels.

7 **Q. Witness Pollock appears to believe that cost-effectiveness tests are used in**
8 **DSM Goals dockets only to determine whether a new DSM program**
9 **should be implemented or whether an existing program should be**
10 **expanded or closed (Page 62, lines 5-8). Is this correct?**

11 A. No. Witness Pollock appears to believe there are only two possible actions
12 resulting from the results of a DSM cost-effectiveness analysis for an existing
13 DSM program: to sign up more participants or close the program to new
14 participants. He is not correct.

15
16 There are two more possible actions that can be taken: to completely cancel a
17 non-cost-effective DSM program, and to change the costs, usually the
18 program's incentive payments, for a non-cost-effective DSM program to return
19 the program to cost-effective status. All four of these actions have been taken
20 by Florida utilities and the FPSC over the last 30-plus years. The last of these
21 four possible actions, adjusting the incentive payment to return the program to
22 cost-effective status, is the action needed for the CDR and CILC programs and
23 is the action that FPL is proposing.

1 FPL has adjusted incentives for its DSM programs over time. It has lowered the
2 incentives, when appropriate, to address declining DSM cost-effectiveness and
3 to save money for all customers. A good example of that is FPL's residential
4 load management ("On-Call") program. The On-Call program is approximately
5 the same size as the CDR and CILC programs combined in terms of MW
6 reduction capability. The incentive for the On-Call program has been adjusted
7 downwards twice in the last 10 years. FPL has also reduced incentives for other
8 DSM programs (FPL's residential HVAC efficiency program, for example) for
9 the same reasons.⁵

10

11 Therefore, FPL's proposed lowering of incentive payments for the CDR and
12 CILC programs to return them to cost-effective status and save money for
13 customers is not at all unusual and it is an action that is taken when needed.

14 **Q. Witness Pollock states that FPL should conduct a customer survey before**
15 **changing incentive levels for the CDR and CILC participants (Page 65,**
16 **lines 14-18). Do you agree?**

17 A. No. FPL does not believe that a survey of either program participants, or a
18 survey of the remaining (roughly) 5 million FPL customers who are not
19 participants in the CDR and CILC programs, and who are paying monthly for
20 non-cost-effective incentives for these programs through ECCR clause charges,
21 is needed. The issue is simply that the programs are no longer cost-effective

⁵ FPL has also increased incentives for DSM programs when appropriate. For example, this action was taken in 2006 after very high electrical loads during the Summer of 2005 resulted in FPL addressing a projected lower level of reserves.

1 and the monthly incentive levels need to be lowered to return the programs to
2 cost-effective status. However, FPL believes there is evidence that many, if not
3 most, of the current program participants will remain on the program if
4 incentive levels are lowered.

5
6 As explained in my direct testimony, 100% of the current CILC participants,
7 and approximately 75% of the CDR participants, all signed up for the programs
8 at incentive levels that were 20% lower than the proposed new incentive level.
9 In addition, Gulf is now signing up participants for a somewhat similar load
10 management program at an incentive lower than the proposed \$5.80/kW-month
11 level. For at least these two reasons, FPL believes that many, if not most, CDR
12 and CILC participants will continue with the programs. If that does not turn out
13 to be the case, then FPL will attempt to sign up new CDR program participants,
14 perhaps in the Gulf area, and/or will add other resources that will be economic
15 compared to these currently non-cost-effective DSM programs.

16 **Q. Do you agree with witness Pollock's statement that a participant's**
17 **assessment of risks and benefits if the incentive payment is lowered will**
18 **lead to a participant changing from CDR or CILC service to firm service?**
19 **(Page 66, lines 2-7)**

20 A. No. His argument is not convincing. Witness Pollock also states that
21 participants "*have to incur cost to be able to safely curtail load*". I agree with
22 that statement. However, 100% of the CILC participants signed up for that
23 program prior to the year 2001 or 20 years ago. In addition, approximately 75%

1 of CDR participants signed up for that program prior to 2012 or almost 10 years
2 ago. If these participants needed to incur costs to safely curtail load, it seems
3 logical to assume they would have already done so prior to/at the time they
4 joined the programs (which would be a minimum of 10 years ago). If these costs
5 consisted largely of capital equipment, such as a backup generator, those capital
6 costs became sunk costs years ago. Those sunk cost should not be a major factor
7 when a participant considers whether to remain with the program.⁶

8 **Q. Do you agree with witness Pollock’s claim that the AURORA model results**
9 **cannot be verified without a detailed audit (Page 63, lines 12-13)?**

10 A. No. The AURORA model is a commercially available optimization model that
11 is widely used in the U.S. by utilities in their resource planning. Thus, it has
12 been examined by each utility that has made the decision to use it, and the use
13 of the model has then been evaluated by the state utility commissions for those
14 utilities. Each of these utilities has found it to be an accurate and valuable
15 planning tool. And, as explained in my direct testimony, FPL conducted its own
16 side-by-side comparison testing of AURORA and its then-current optimization
17 model, EPRI’s EGEAS model, in the second half of 2018 and early 2019. The
18 results from the two models were comparable, and AURORA has the capability
19 to simultaneously plan for transmission constrained areas such as Gulf and FPL,
20 a capability that was needed with NextEra Energy’s acquisition of Gulf.

⁶ Note that backup generators also allow these commercial/industrial customers to have continued operation during/after storm outages, thus making it even more unlikely that customers considering dropping out of the programs would do so because they wish to stop annual maintenance costs for the backup generators.

1 As a result, FPL switched away from the EGEAS model and has used the
2 AURORA model since early 2019. Analyses using this model have supported
3 the FPL/Gulf 2020 and 2021 Ten Year Site Plans. FPL has confidence in the
4 model and plans to continue using AURORA in its resource planning work for
5 the foreseeable future.

6

7 **3) The intervenors' inappropriate attempt to turn this docket into a DSM goals**
8 **proceeding:**

9

10 **Q. You indicated earlier that the intervenor witnesses have attempted to turn**
11 **this docket into a DSM goals proceeding?**

12 A. Yes. Witnesses Rábago, Whited, and Wilson attempted to do so in their
13 testimonies.

14 **Q. Based on FPL's filing and the issues in this docket, do you believe that**
15 **attempt is appropriate?**

16 A. No. There are at least three reasons for this. First, there is only one specific
17 DSM issue in this docket, as directed by the FPSC in FPL's 2020 DSM Plan
18 docket (Docket No. 20200056-EG). That issue is FPL's proposal to lower the
19 monthly incentive payments for the CDR and CILC programs. Second, FPL's
20 treatment of DSM in its analyses followed the FPSC's latest direction regarding
21 DSM as expressed in their 2019 DSM Goals order. Third, two of the factors
22 that were undoubtedly considered by the FPSC in this most recent DSM Goals
23 order – the continued decline in DSM cost-effectiveness, and that most of FPL's

1 and Gulf’s DSM programs are no longer cost-effective – were accounted for at
2 the start of FPL’s analyses and these facts have not changed.

3

4 Nevertheless, these intervenor witnesses’ testimonies attempt to continue to re-
5 litigate the FPSC’s 2019 DSM Goals docket decisions in this docket. They did
6 so by trying to introduce into this docket a number of issues debated in the 2019
7 DSM Goals docket, and which are again being raised in the proposed
8 amendment to Rule 25-17.0021, F.A.C., Goals for Electric Utilities (“DSM
9 Rule”) in Docket No. 20200181-EI. These issues have no direct bearing on this
10 docket and are inappropriate for this docket.

11 **Q. Would you please provide a brief summary of some of the DSM-related**
12 **issues that the intervenor witnesses are trying to introduce into this**
13 **docket?**

14 A. Yes. Because I believe those issues to be inappropriate topics for this docket, I
15 will not discuss each issue in detail. However, the actual statements made by
16 the intervenor witnesses in regard to these DSM-related issues, plus FPL’s
17 correction of their misguided statements, are presented in Exhibit SRS-14.

18

19 The following is a brief listing of the DSM issues these witnesses have
20 attempted to inject into this docket⁷:

⁷ Note that the objective of raising each of these issues is to make DSM options appear more economic than they actually are, or to otherwise end up with more DSM regardless of cost-effectiveness.

- 1 - Do not use the RIM test (despite the fact that it is the only DSM cost-
2 effectiveness test that allows a true apples-to-apples comparison with
3 generation options);
- 4 - Do not use the two-year payback screen to address free ridership for DSM
5 (despite the fact that this screen provides a logical and simple approach to
6 addressing free riders as required in Florida);
- 7 - Do set DSM goals based on an arbitrary MWh reduced vs MWh sold basis
8 (despite the fact that the FPSC rejected this approach in both the 2014 and
9 2019 DSM Goals dockets); and,
- 10 - Do use a \$/MWh (or cents/kwh) approach of comparing DSM versus supply
11 options to make resource decisions (despite the fact that this approach is
12 fundamentally flawed and the FPSC has rejected this approach several
13 times).⁸

14 **Q. How did FPL account for DSM in the Steps 1 through 3 analyses that**
15 **support its filing in this docket?**

16 A. All of these analyses assumed, as a given, the most recently set (2019) DSM
17 Goals amounts for both the Gulf and FPL areas which addressed the years 2020
18 through 2024. In addition, FPL assumed additional DSM, again as a given, for
19 the years 2025 through 2030 based on the amount of DSM that FPL projected
20 was cost-effective after 2024 in its 2019 DSM Goals filing to the FPSC.

⁸ The fundamental flaws in this approach have also been detailed in rebuttal testimony of mine in FPSC dockets more than once: 2009 DSM Goals Docket No. 20080407-EG; 2009 Nuclear Cost Recovery Clause (“NCRC”) Docket No. 20090009-EI; 2010 NCRC Docket No. 20100009-EI; and 2014 DSM Goals Docket No. 20130199-EI.

1 **Q. Please explain during what time periods FPL’s Steps 1 through 3 analyses**
2 **were performed.**

3 A. The time period during which the initial Step 1 and 2 analyses were conducted
4 was the second half of 2018 through the first Quarter of 2019. The current Steps
5 1, 2, and 3 analyses were conducted during the second half of 2020 through
6 most of the first Quarter of 2021.

7 **Q. Why are these time periods important to keep in mind in regard to**
8 **consideration of DSM in these analyses?**

9 A. By the second half of 2018, both FPL and Gulf were performing DSM cost-
10 effectiveness analyses for the 2019 DSM Goals docket. At that time, it was
11 apparent to both companies that the trend of declining cost-effectiveness for
12 utility DSM programs that had begun about 10 years before was continuing.

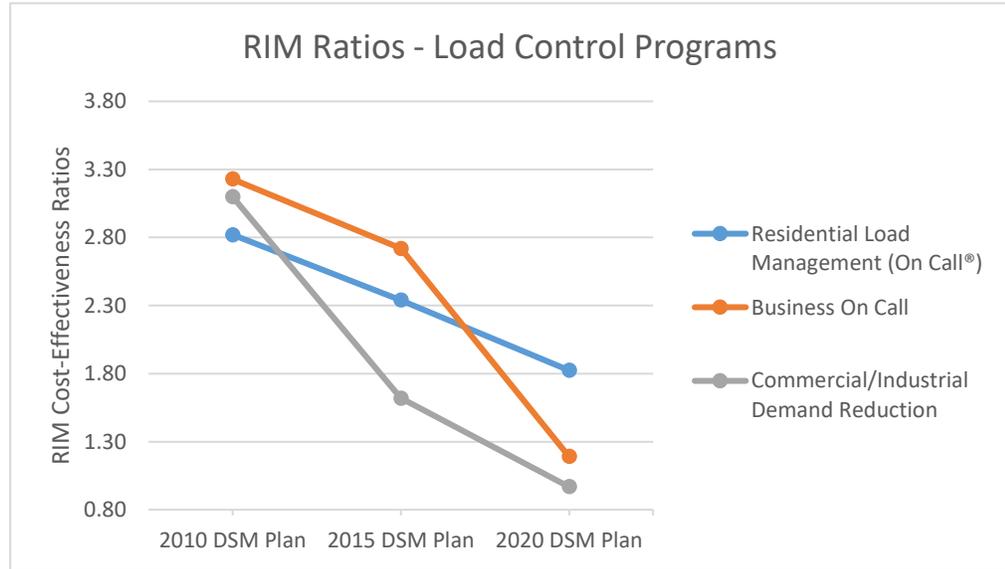
13 **Q. Can you demonstrate this trend of declining cost-effectiveness for utility**
14 **DSM programs?**

15 A. Yes. This is shown graphically in Figures SRS-5a and SRS-5b below. These
16 figures show the results of cost-effectiveness analyses conducted for FPL’s
17 DSM programs from the 2010, 2015, and 2020 DSM Plan filings using the RIM
18 test⁹.

⁹ These graphic depictions of declining cost-effectiveness for FPL’s DSM programs were previously provided in discovery in this docket in response to CLEO/Vote Solar’s Second Request for Production of Documents, number 60. That response also provided graphs of DSM cost-effectiveness results using the TRC test which also show a trend of declining DSM cost-effectiveness. Thus, a trend of declining DSM cost-effectiveness is apparent regardless of which test, RIM or TRC, is used.

1

Figure SRS-5a

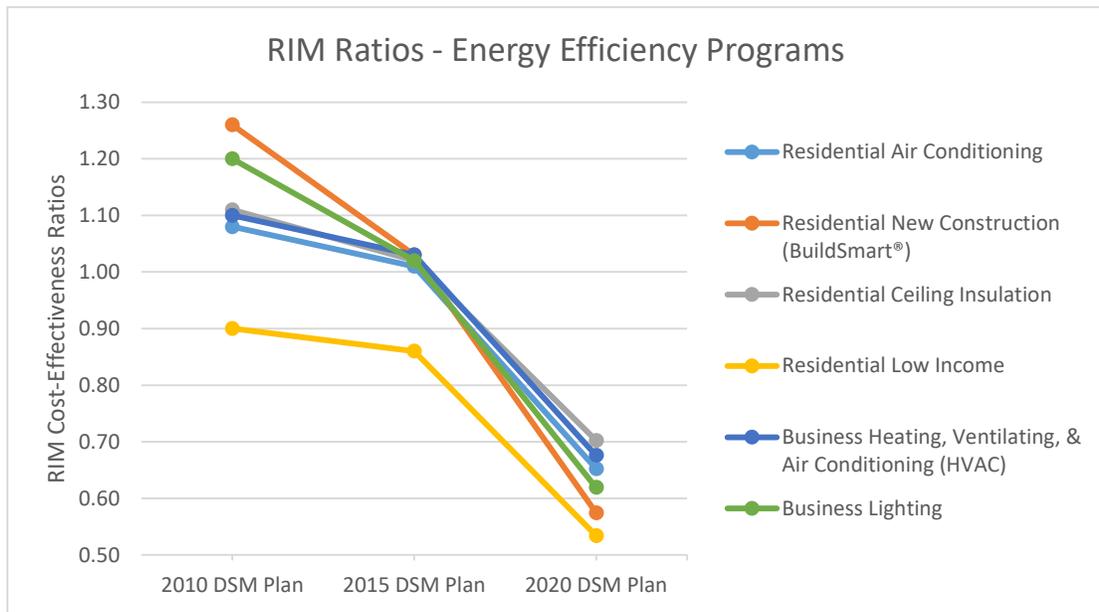


2

3

4

Figure SRS-5b



5

6

7

8

The trend of declining cost-effectiveness of DSM programs is clearly shown in these figures. Furthermore, in the 2019 DSM Goals docket, only a few of FPL's

1 current DSM programs were still cost-effective, and none of Gulf's current
2 DSM programs were cost-effective.

3

4 The 2019 DSM Goals docket had been completed in late 2019 which was before
5 FPL's current Steps 1, 2, and 3 analyses began. In the 2019 DSM Goals docket,
6 the FPSC essentially ordered the utilities to continue their then-current level of
7 DSM, but only through the year 2024. In my opinion, the FPSC made its
8 decision based at least partly on the evidence presented in the docket that: (i)
9 the trend of declining cost-effectiveness for utility DSM was continuing, and
10 (ii) most of the current utility DSM programs in Florida, including for FPL and
11 Gulf, were no longer cost-effective.

12

13 As a result, the FPSC chose to reject the positions taken by several parties to
14 the 2019 DSM Goals docket, including SACE and LULAC, to significantly
15 increase Florida utilities' DSM Goals. And, as mentioned above, various
16 intervenors are making the same arguments again in this docket.

17 **Q. Did the results of analyses performed for the 2019 DSM Goals docket, plus**
18 **the FPSC's decisions in that docket, contribute to FPL's decision to not**
19 **evaluate additional DSM in its Steps 1, 2, and 3 analyses?**

20 A. Yes. It was clear from the 2019 DSM Goals analyses being conducted as FPL's
21 initial Steps 1 and 2 work was underway that additional DSM would not be
22 cost-effective and, therefore, not a viable resource option in the Steps 1, 2, and
23 3 analyses. This conclusion was reinforced during 2019 by the results from the

1 initial Steps 1 and 2 analyses. These results showed there were significant cost-
2 effective improvements that could be made in the generation and transmission
3 systems that would result in the Gulf and FPL systems becoming even more
4 efficient and economic.

5
6 Simple logic dictates that if most utility DSM programs were not cost-effective
7 on the Gulf and FPL systems that were the bases of the 2019 DSM Goals docket
8 analyses, then these DSM programs would be even less cost-effective on a more
9 efficient, more economic utility system.

10 **Q. Can you provide an example of the more efficient, more economical**
11 **system?**

12 A. Yes. I will provide two examples with the first example focusing on fixed costs.
13 On pages 24 and 25 of my direct testimony, I discussed that a number of utility
14 costs that could potentially be avoided or deferred by DSM were declining
15 which, although good news for FPL's customers, was reducing the potential
16 benefits of utility DSM programs. One of these costs is the cost of new
17 generation. An examination of the cost of new CC capacity provides an example
18 of how the Steps 1, 2, and 3 analyses have identified ways to make the FPL/Gulf
19 integrated system more efficient and economic.

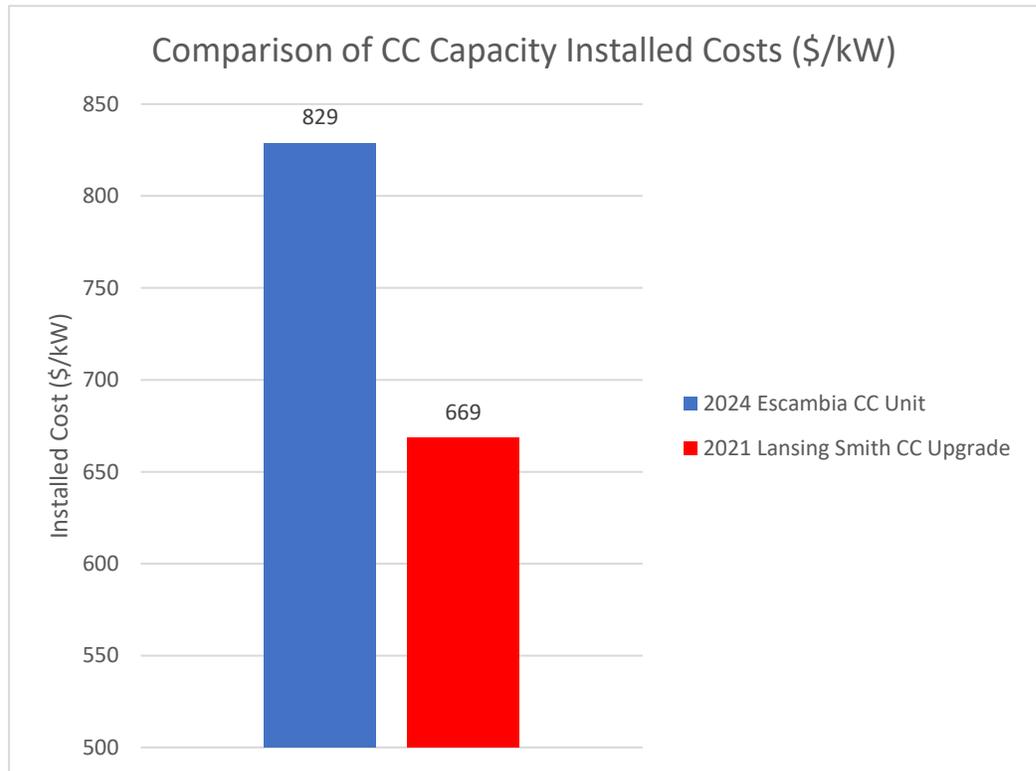
20
21 In Gulf's 2019 DSM Goals filing, the avoided unit against which its DSM was
22 compared was a 2024 CC unit sited in Escambia County. One of the
23 improvements selected in the initial Steps 1 and 2 analyses was an approximate

1 70 MW upgrade to Gulf’s existing Lansing Smith CC unit. A comparison of the
2 installed \$/kW cost of these two CC capacity options, the new Escambia CC
3 unit and the Lansing Smith upgrade, is provided in Figure SRS-6 below.

4

5

Figure SRS-6



6

7

8 The installed cost of the Escambia County CC that was used as the avoided unit
9 in Gulf’s 2019 DSM Goals analyses was \$829/kW in 2024 dollars (as shown
10 by the blue bar) and the installed cost of the already completed CC capacity
11 upgrade was \$621/kW in 2021 dollars. To more meaningfully compare the two
12 cost values, the Lansing Smith upgrade cost value in 2021 has been escalated
13 assuming a 2.5% annual escalator to provide a 2024 dollar value of \$669/kW
14 value (as shown by the red bar). Therefore, new CC capacity was added to the

1 Gulf area at an installed cost approximately 24% lower than the installed cost
2 for the CC capacity that had been used as the avoided unit in Gulf's 2019 DSM
3 Goals analyses.

4
5 As a result of this Lansing Smith upgrade, plus other improvement options
6 including the NFRC, the Escambia CC was then no longer selected as a cost-
7 effective option at the conclusion of the initial Steps 1 and 2 analyses.
8 Therefore, the Gulf (and FPL) system has gotten more economic than was the
9 case when the 2019 DSM Goals analyses were performed. This further supports
10 the decision to not examine additional DSM as a resource option when DSM
11 was not projected to be cost-effective even before system improvements such
12 as this CC upgrade began to be made.

13 **Q. This first example focused on fixed costs. Did these analyses also identify**
14 **ways to lower variable costs?**

15 A. Yes. For an example of how the current Steps 1, 2, and 3 analyses resulted in a
16 projection of lower variable costs, I turn to FPL's response to CLEO/Vote
17 Solar's Second Set of Interrogatories, number 118. Part of this discovery
18 request asked for a projection of system fuel savings from the Steps 1, 2, and 3
19 analyses. FPL's response to that portion of this interrogatory was that the Steps
20 1, 2, and 3 analyses were projected to save approximately \$1.7 billion CPVRR
21 in fuel costs alone.

1 Therefore, the FPL/Gulf integrated system is also projected to become
2 significantly more economic in regard to fuel costs. This again supports the
3 decision to not examine already non-cost-effective DSM when the new utility
4 system on which DSM would be evaluated was projected to become
5 significantly more efficient and economic.

6 **Q. Witness Wilson’s testimony included a recommendation that FPL**
7 **incorporate its currently approved DSM goals for 2020 through 2024 into**
8 **its load forecasts through its long-term planning horizon (Page 8, lines 1-**
9 **3). Do you agree with this recommendation?**

10 A. No. In responding to this, let’s first step back and recall what the FPSC actually
11 did in the 2019 DSM Goals docket. At the start of that process, the FPSC’s
12 intent was to set DSM goals for the next 10 years, *i.e.*, for the years 2020
13 through 2029. This setting of goals for 10 years is what had been done in all
14 prior DSM Goals dockets dating back to 1994. However, after seeing extensive
15 testimony and analysis from all of Florida’s utilities that the cost-effectiveness
16 of DSM was steadily declining¹⁰, the FPSC decided to set goals for only 5 years
17 (2020 through 2024), knowing that the goals would be reexamined in 2024.
18 Those goals set through 2024 were essentially to continue the current level of
19 DSM for 5 more years even though most of the current DSM programs were no
20 longer cost-effective.

¹⁰ The fact that DSM cost-effectiveness is declining was not challenged by the intervenor parties in the 2019 DSM Goals docket and has not been challenged by intervenors in this docket.

1 If the FPSC expressly declined to set goals beyond 2024, based at least in part
2 over concerns over DSM's declining cost-effectiveness, it does not make sense
3 to automatically assume that future Commissions will continue setting non-
4 cost-effective DSM goals for all years in the planning horizon (through 2068).
5 For that reason, I believe witness Wilson's recommendation is unwise. The
6 previously described approach that FPL took in setting DSM assumptions is
7 more consistent with the FPSC's ruling in the 2019 DSM Goals docket.

8 **Q. As part of the intervenors' attempt to turn this docket into a DSM Goals**
9 **proceeding, do you believe they tried to create an impression that FPL does**
10 **not value DSM? If so, what is FPL's view of DSM?**

11 A. Yes. However, the impression they are trying to create – that FPL does not value
12 DSM - is inaccurate. To the contrary, FPL has long been an advocate of DSM
13 programs that are cost-effective for all of its customers; *i.e.*, DSM programs
14 that benefit program participants while not putting upwards pressure on electric
15 rates for all customers.

16
17 **4) The intervenors' unhappiness with the results of FPL's resource planning**

18 **analyses:**

19

20 **Q. Did the intervenors express unhappiness with the results of FPL's resource**
21 **planning process and analyses?**

22 A. Yes. And, based on their comments, it is clear that they either do not understand
23 FPL's resource planning process and analyses, or they are simply attempting to

1 criticize the process and analyses because they do not like the results of the
2 analyses.

3 **Q. Please discuss some of the statements the intervenors made regarding**
4 **FPL's planning process and analyses.**

5 A. Most of the misguided statements made about FPL's resource planning process
6 and analyses were from the testimonies of witnesses Wilson and Rábago. I will
7 start with a few such statements from witness Wilson. The first statement of
8 hers that I will examine is:

9
10 *"FPL's planning process is biased toward gas-fired resources."* (Page 8, lines
11 6-7).

12 **Q. Does she provide any support for that statement?**

13 A. No.

14 **Q. Is FPL's resource planning group, or its planning process, biased toward**
15 **gas-fueled resources?**

16 A. No. I have served in FPL's resource planning group continually since 1991 as
17 a supervisor, manager, and now as its director. The guiding principle of FPL's
18 resource planning analyses during that time is that FPL's analyses are agnostic
19 in terms of which resource options are selected. My job, and the job of each
20 member of the resource planning group, is to provide accurate analysis results
21 to FPL management. Consequently, FPL's planning process has no bias toward
22 or against any type of resource option.

1 **Q. If FPL had a bias toward gas resources, one should be able to see evidence**
2 **of that in FPL’s resource plan. Please discuss the changes in generation**
3 **resources that FPL is actually planning to make for years 2021 through**
4 **2030.**

5 A. Figures SRS-7a and SRS-7b below present that information in a graphic format.
6 The information is based on the resource plan that emerged from FPL’s current
7 Step 3 analysis results that are presented in detail in my direct testimony. This
8 information also appears in the 2021 FPL/Gulf Ten Year Site Plan. The values
9 shown in the figures account for generating resource additions, upgrades, and
10 retirements which are combined to develop a net nameplate MW addition value
11 for the following generation categories: CC, CT/steam, solar, and battery
12 storage.¹¹

13
14 Figure SRS-7a first shows the net additions separately for the two types of gas-
15 fueled options, CC and CT/steam. Then Figure SRS-7b combines these two
16 types of gas-fueled options into a singled “gas-fueled” category.

¹¹ Note that the solar resources being discussed were previously presented in my direct testimony and in FPL/Gulf’s 2021 Ten Year Site Plan. These solar additions include: solar being installed in 2021, the planned solar in 2022 and 2023, the SoBRA-based solar additions planned for 2024 and 2025, and all of the 2026-2030 planned solar.

1

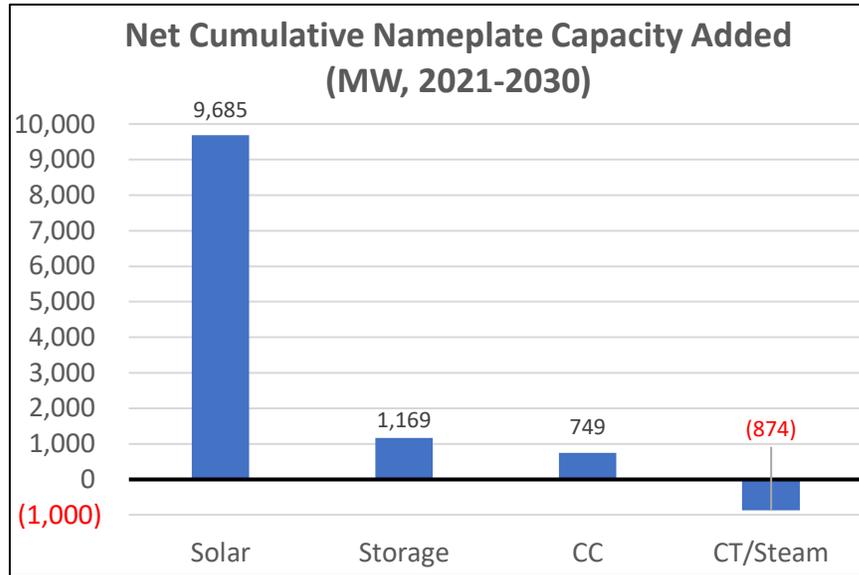
Figure SRS-7a

2

Net MW Additions by Resource Type: 2021-2030

3

(w/ separate values for CC and CT/steam)



4

5

6

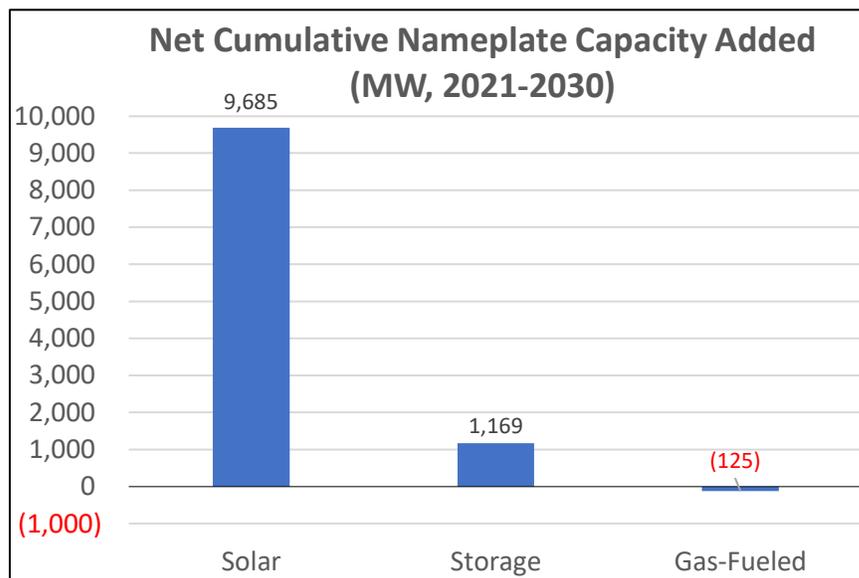
Figure SRS-7b

7

Net MW Additions by Resource Type: 2021-2030

8

(w/ a combined value for gas-fueled resources)



9

1 It is difficult to look at these values and see why anyone would even try to make
2 a claim that FPL is “*biased*” toward gas-fueled resources as witness Wilson
3 did. (In fact, if one were so inclined - as witness Wilson obviously is - to look
4 for “*bias*” in FPL’s resource planning process, one might make a circumstantial
5 argument that FPL is biased against gas-fueled options.)

6 **Q. Because this information used to prepare Figures SRS-7a and 7b is readily**
7 **available in both the 2021 FPL/Gulf Ten Year Site Plan and in your direct**
8 **testimony, why do you believe witness Wilson made a statement that was**
9 **so obviously wrong?**

10 A. I believe it is because this statement fits an objective of her testimony. Witness
11 Wilson, representing CLEO/Vote Solar, had an objective of promoting a view
12 that the only acceptable resource options to add – regardless of the
13 characteristics of the individual utility system in question or system economics
14 – are DSM, renewables, and storage. Having produced no modeling analyses
15 with which she might have questioned the results of FPL’s analyses, witness
16 Wilson has taken another approach.

17
18 That approach is to simply make statements (such as the inaccurate one just
19 discussed) that attempt to cast aspersions on FPL’s motives, then trying to
20 support her favored resource options through comparison methods/metrics
21 (such as the fundamentally flawed \$/MWh comparison method) that do not
22 address all of the system impacts of resource options and, for that reason, are
23 not used to make resource planning decisions.

1 Witness Wilson is not happy with the results of FPL’s analyses. Rather than put
2 in the work to present any modeling analyses that might have provided results
3 with which she might meaningfully challenge FPL’s analyses, she has decided
4 instead to simply claim that FPL is biased toward resource options that are not
5 her favorites.

6 **Q. Witness Wilson also claimed that FPL did not examine a retirement of the**
7 **Crist units (Page 15, lines 9-10) and provided little analysis that the coal-**
8 **to-gas conversion was in the best interest of customers (Page 16, lines 6-7).**
9 **Do you agree with those statements?**

10 A. No. Although she was not specific, I will assume that witness Wilson’s
11 reference to “*Crist Units*” is for Crist Units 6 & 7 only, not for the much smaller
12 (75 MW each) Crist Units 4 & 5 which will be retired soon.

13
14 In my deposition, I was asked a question of whether FPL had examined a
15 retirement of Crist Units 6 & 7 and, at that time, I replied that I did not recall if
16 such an analysis had been performed. Witness Wilson chose to take the ‘I don’t
17 recall’ response and then leap to a definitive claim that FPL did not examine a
18 Crist retirement. However, after my deposition, I checked back through the
19 many hundreds of analyses that FPL performed from mid-2018 to the March
20 2021 filing date in this docket to see if a retirement had been examined. The
21 answer was that FPL had examined that option.

1 FPL considered the possibility of retiring these two Crist units at two different
2 points in time in its overall analyses. The first consideration came during the
3 initial Steps 1 and 2 analyses. These analyses first focused on Gulf as a stand-
4 alone utility with no new transmission ties to FPL (Step 1), and then as a stand-
5 alone utility which was connected to FPL via the NFRC (Step 2).

6
7 Part of the consideration of potentially retiring Crist Units 6 & 7 at that time
8 was a look at how much capacity was already being retired on the Gulf system.
9 A look back at Table SRS-3 in my direct testimony is helpful in this discussion.

10
11 That table shows Gulf's generation resources and the percentage each
12 generator's capacity is of the total Gulf generation capacity. Two generation
13 resources comprising 27% (Shell PPA) and 16% (Daniel), which combined
14 represent 43%, of Gulf's total generation were already projected to be retired
15 by the beginning of 2024. And, as shown on both pages of Exhibit SRS-7 in my
16 direct testimony, FPL's optimization model selected either 2 CTs and a 1x1 CC
17 (Step 1), or 4 CTs (Step 2), as the primary replacements for the 43% of Gulf's
18 total capacity that was being retired.

19
20 As also shown in Table SRS-3, the Crist Units 6 & 7 together provide
21 approximately 775 MW of generation capacity, or another 24% of Gulf's total
22 generation. If those units were also to be retired, fully 67% of Gulf's generation

1 fleet would be retired and another approximately 700 MW of new capacity
2 would have to be added to Gulf in relatively short order.

3

4 However, the retirement of Crist Units 6 & 7 was deemed to be unnecessary for
5 a couple of reasons. First, the coal-to-gas conversion of Crist Units 6 & 7 would
6 not remove any existing capacity (thus requiring no additional new capacity to
7 be added). Second, the conversion was projected to result in significant savings
8 for customers. As shown in Exhibit SRS-7, page 1 of 2, in my direct testimony,
9 the conversion was projected to result in \$236 million CPVRR net savings to
10 customers. The conversion project was also one that could be done relatively
11 quickly, thus allowing customers to begin realizing savings more quickly.

12

13 Based on these considerations, plus recognition that the cost to replace 700 MW
14 more of retired capacity would be hundreds of millions of dollars, the decision
15 was made to not consider further the retirement of Crist Units 6 & 7 and to
16 proceed instead with the coal-to-gas conversion project. That conversion has
17 now been completed, and customers are already benefiting from it.

18 **Q. Please briefly discuss the second consideration of retiring Crist Units 6 &**
19 **7 that occurred at a later point in time.**

20 **A.** By mid-2019, FPL had completed its early analyses of Step 3 which evaluated
21 the economics of a single, integrated FPL/Gulf system and those results for an
22 integrated system looked promising. Using an integrated system as a starting

1 point, FPL returned to the question of a possible early retirement of Crist Units
2 6 & 7.

3
4 Analyses using the AURORA optimization model were then performed
5 assuming a retirement of the Crist Units 6 & 7 and allowing the model to select
6 from solar, batteries, and gas-fueled replacement options. In these analyses, a
7 trio of CTs (a 3x0 CT) with a total generation capacity of 704 MW was selected
8 by the AURORA model as the most economic choice to replace the retired Crist
9 capacity. The projected additional cost for all ‘Crist retirement’ cases, was at
10 least \$556 million CPVRR more expensive than the ‘no Crist retirement’ base
11 cases. Based on these results, the early retirement of Crist Units 6 & 7 has been
12 dropped as a potential option for the foreseeable future.

13 **Q. Witness Wilson’s testimony states that FPL should have waited before**
14 **making decisions about certain improvements to the Gulf generation fleet.**
15 **(Page 17, lines 5-10). Do you agree?**

16 A. No. Witness Wilson seems to believe that if solar is cost-competitive versus CT
17 capacity, then solar should automatically be substituted for the CTs – and FPL
18 should just delay making any decision until solar economics trump CT
19 economics for the Gulf area. Her ‘wait-until-we-get-a-certain-answer-we-like’
20 approach is illogical. It fails to account for actual transmission system and
21 operational considerations. The Gulf area currently has only 44 MW of fast start
22 resources: Lansing Smith 3A (32 MW), and Pea Ridge (12 MW). And these

1 small fast start resources are scheduled to be retired soon. A utility needs fast
2 start resources in order to allow the system to be operated reliably.

3

4 As previously mentioned, the Crist CTs were first selected for the Gulf area
5 based on economic-only analysis, then discussions that added in the system
6 operations and transmission perspectives confirmed that fast start/longer
7 duration resources (such as CTs) would significantly increase FPL's ability to
8 reliably operate the system as soon as Gulf left the Southern Company system.
9 Thus, Gulf and FPL made the correct decision in 2019 to proceed with acquiring
10 the new CTs.¹²

11 **Q. Do you agree with witness Wilson's claim that batteries could substitute**
12 **for the CTs selected for the Gulf area (Page 20, lines 6-7)?**

13 A. No, not for the Gulf area. For purposes of this discussion, I will ignore the fact
14 that the comparative economics of these two resource options favor CTs.
15 Instead, I will focus on the capacity, and the duration (length of time) that the
16 capacity can be provided, by each option.

17

18 Witness Wilson is correct regarding capacity from an 'academic' perspective,
19 but wrong from the more important 'real world' perspective in regard to the
20 Gulf area. In a reserve margin calculation, a MW of CT capacity, and a MW of
21 battery capacity (whether charged by solar or other sources), can have
22 equivalent value if the full output of the battery can be delivered for at least

¹² In regard to a comment from witness Wilson's about solar prices declining when forecasts are updated, forecasted natural gas prices decreased significantly when the fuel price forecast was updated.

1 several continuous hours.¹³ However, in the real world of system operations,
2 these two resource options are not equivalent in terms of their value during
3 periods of very high load and/or system emergencies that last extended periods
4 of time.

5
6 CTs can operate continually for as long as they are needed (and, in recent years,
7 FPL has had to run CTs continually for about 24 hours). But batteries have
8 constraints on the amount of MWh they can produce. Once they have provided
9 their designed amount of energy, they cannot provide any more energy until
10 they are recharged.

11
12 Then, the recharging process can become a dual problem, particularly if the
13 utility is still in a very high load/emergency situation when the recharging is
14 needed. First, the ‘exhausted’ battery can no longer contribute any energy with
15 which to meet load. Second, when the utility attempts to recharge the battery,
16 the recharging battery now becomes an additional electric load that must be
17 served. Furthermore, because batteries have a round-trip efficiency of (roughly)
18 90%, the battery will require about 100 MWh of charging for every 90 MWh
19 that it can return to the system once it stops becoming another electrical load
20 and starts providing energy. In summary, from an operational perspective,

¹³ The needed duration for a battery’s maximum hourly capability to be considered as firm capacity varies from utility to utility based, among other factors, on each utility’s load shape. All else equal, the longer the needed duration, the more expensive the battery.

1 especially in a very high load/emergency situation that lasts for an extended
2 period, CTs will typically have more value to system operators.

3

4 As previously mentioned, the Gulf area has almost no fast-start/long duration
5 capability which can be used to address very high load or other system
6 emergency. Therefore, from a system reliability and operations perspective,
7 CTs are the logical and correct choice for the Gulf area at this time. Conversely,
8 the FPL area is quite different. The FPL system/area already has a sufficient
9 amount of fast start/long duration capability due to the CTs already on its
10 system. Because of this, FPL is now able to begin using fast start/shorter
11 duration batteries, such as the Manatee battery, to address specific needs. And,
12 as FPL's resource plan shows, with the assumption that the cost of batteries will
13 continue to decline, additional batteries (of relatively short duration) have been
14 selected as cost-effective options in the integrated FPL/Gulf system for the
15 latter years of this decade.

16 **Q. What are examples of misguided statements made by witness Rábago that**
17 **refer to FPL's resource planning process and analyses?**

18 A. I will first look at two statements of his that pertain to the addition and
19 acceleration of the Crist CTs and the NFRC that show a lack of understanding
20 of FPL's analyses and decisions.

21

22 He first states that new CTs were added in the Gulf area due to a new single-
23 contingency risk created by the NFRC (Page 19, lines 1-3). He then claims that

1 the CTs were accelerated forward to mitigate the risk of failure of the NFRC
2 (Page 19, lines 21-22). In making these claims, witness Rábago simply has not
3 grasped the full picture.

4
5 New CTs were originally selected as an economic capacity choice for the Gulf
6 system in all of the initial Step 1 and Step 2 analyses. When these resource
7 planning results were then discussed with FPL's system operations and
8 transmission planning groups, those groups strongly supported the selection and
9 indicated that the new CTs would significantly enhance FPL's ability to reliably
10 operate the Gulf area, especially in long duration high load/system emergency
11 conditions.

12
13 Those discussions led to the conclusion that not only were the new CTs needed
14 for the Gulf area, but that they needed to be in-service by the time Gulf left the
15 Southern Company system. With almost no existing fast start generation
16 capability in the Gulf area, and no continued committed firm support from
17 Southern Company, it would be difficult to reliably operate the Gulf
18 system/area if either the NFRC, the large Lansing Smith CC unit, and/or the
19 large Shell PPA capacity through mid-2023, was suddenly lost.¹⁴

¹⁴ I note from reading witness Wilson's testimony that she appeared to understand the fact that the CTs are needed in case of unexpected loss of the NFRC or the large Lansing Smith unit. (See Page 17, lines 1-2)

1 Therefore, the selection of the CTs was based on economics and supported from
2 a system reliability/operations perspective. The acceleration of the CTs was
3 then necessitated by consideration of at least two potential (longer term)
4 contingencies, the unexpected loss of the large Lansing Smith CC unit and/or
5 the loss of the NFRC connection to FPL.

6 **Q. Witness Rábago claims that CC upgrades (such as at Lansing Smith Unit**
7 **3) and the coal-to-gas conversion of Crist Units 6 & 7 as “costly” (Page 19,**
8 **Lines 7-9). Do you agree with this claim?**

9 A. No. After making this claim, he fails to explain: ‘costly compared to what?’ In
10 my direct testimony, Exhibit SRS-7, page 1 of 2, the Lansing Smith upgrade
11 project was shown to result in a projected \$41 million CPVRR net savings and
12 the Crist coal-to-gas conversion was shown to result in a projected \$236 million
13 CPVRR net savings.

14
15 Perhaps witness Rábago’s focus is solely on the installed costs of projects and
16 not on total system net cost impacts. However, sound resource planning
17 accounts for all system costs that are reflected in electric rates when evaluating
18 resource options and resource plans. In combination, the Lansing Smith
19 upgrade and the Crist coal-to-gas conversion are projected to result in a CPVRR
20 net savings for customers of more than \$270 million ($41 + 236 = 277$). From a
21 resource planning perspective, \$270 million CPVRR net savings to customers
22 definitely does not equate to the projects being “costly”.

1 **Q. Witness Rábago expresses concerns about the volume of plant retirements**
 2 **and what that says about FPL’s planning processes and approach to**
 3 **providing low cost service to customers. (Page 21, lines 24-25, and Page 22,**
 4 **line 1) and claims FPL faces no real financial consequences for building**
 5 **new generation that becomes obsolete or uneconomic “long before the end**
 6 **of their useful lives”. (Page 22, lines 4-6). Are these concerns well founded?**

7 **A.** No. This is one of the more baseless contentions he makes. My reaction is that
 8 I wonder by what standard witness Rábago attempts to judge what denotes
 9 “long before the end of their useful lives”? His testimony fails to explain this.

10

11 In an attempt to provide a resource planning perspective on the specific
 12 generating units that are being retired in the 2021 through 2030 time period (as
 13 previously presented in FPL’s testimony in this docket, and in the 2021
 14 FPL/Gulf Ten Year Site Plan), Figure SRS-8, shown below, was developed.

15

16

Figure SRS-8

17

Generation Unit Retirements: Years and Capacity Factors

Unit	Summer Peak Rating (MW)	In-Service Year	Retirement Year	Years in Operation (Yrs.)	Projected Capacity Factor										
					2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Manatee 1	813	1976	2021	45	0.4%	--	--	--	--	--	--	--	--	--	--
Manatee 2	813	1977	2021	44	0.0%	--	--	--	--	--	--	--	--	--	--
Scherer 4	636	1989	2022	33	10.4%	--	--	--	--	--	--	--	--	--	--
Daniel 1	251	1977	2024	47	5.4%	2.0%	0.0%	--	--	--	--	--	--	--	--
Daniel 2	251	1981	2024	43	3.1%	0.7%	0.0%	--	--	--	--	--	--	--	--
Crist 4	78	1959	2025	66	7.3%	5.7%	7.1%	8.2%	--	--	--	--	--	--	--
Pea Ridge	12	1998	2024	26	1.1%	1.3%	1.2%	1.8%	1.3%	--	--	--	--	--	--
Crist 5	78	1961	2027	66	9.8%	9.1%	9.3%	10.2%	9.2%	9.7%	--	--	--	--	--
Lansing Smith 3A	32	1971	2028	57	0.6%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	--	--	--	--

18

1 Figure SRS-8 primarily presents two types of information: the age/length of
2 service of the generation resource and the projected capacity factors going
3 forward. In regard to the projected age/length of service, all but two of the
4 generation resources that are planned to be retired will have been in-service for
5 more than 40 years. Included in that list are one generator which will have been
6 in-service for 57 years and two others which will have been in-service for 66
7 years. The two exceptions are: (i) three very small (4 MW each) Pea Ridge CTs
8 that will be retired after 26 years of service, and (ii) a no longer economic coal
9 unit (Scherer 4) co-owned by FPL that has been operating for 33 years.

10

11 In regard to projected capacity factors, only two of the units are projected to
12 operate with a capacity factor of even 10%. The rest of the units have projected
13 capacity factors in single digits. These very low projected capacity factors
14 indicate that these generators are no longer economic to operate on a regular
15 basis due to significant improvements in the operating efficiency of the
16 generation fleet.

17

18 Therefore, Figure SRS-8 shows that the generation resources scheduled to be
19 retired are both old and uneconomic to regularly operate. From a resource
20 planning perspective, it would certainly appear that, for these generators, “*the*
21 *end of their useful lives*” has either arrived or is right around the corner, and
22 that the planning process is working fine in identifying generating units that are
23 ready for retirement.

1 **5) Problems in numerous other statements made by intervenor witnesses:**

2

3 **Q. You have previously commented on some statements witness Rábago**
4 **made. Are there any other statements he made in his testimony that**
5 **deserve attention?**

6 A. Yes. Witness Rábago made more statements that deserve comment because
7 they are so remarkably misleading or incorrect. Three of these reflect on his
8 perception of DSM cost-effectiveness tests that can be summarized as follows:

- 9 - He claims that the RIM cost effectiveness test is not really a cost-
10 effectiveness evaluation (Page 24, lines 22-23);
11 - He claims that my direct testimony states that the TRC test does not account
12 for utility costs (Page 24, line 25 and Page 25, lines 1-2); and,
13 - He claims that the state of Florida treats all energy savings as lost revenues.
14 (Page 26, lines 21-24).

15

16 The succinct response to these statements is that each of witness Rábago's
17 claims is wrong (and the explanations for why they are wrong is provided in
18 Exhibit SRS-14).

19 **Q. Did witness Whited make statements in her testimony that are worthy of**
20 **scrutiny?**

21 A. Yes. The first of these is a claim that I found interesting. Witness Whited claims
22 that vulnerable customers are more likely to have a hard time paying their bills
23 due to higher electric rates (Page 8, lines 11-12). Curiously, her claim is

1 inconsistent with statements made by witness Wilson, who also represents
2 CLEO/Vote Solar and, even more surprisingly, is employed by the same
3 consulting firm, Synapse.

4
5 Witness Wilson seems strongly opposed to the RIM cost-effectiveness test for
6 DSM. This test is designed to identify DSM options that will have a more
7 beneficial impact on electric rates¹⁵ compared to a competing supply option. In
8 other words, a DSM option that passes the RIM test is projected to result in a
9 more beneficial impact on electric rates than if the competing supply option
10 were chosen.

11
12 Returning to witness Whited's statement above, however, reflects an obvious
13 belief in the value of minimizing electric rates. Because both witnesses are
14 employed by the same company, and represent the same client in this docket, it
15 would seem likely that they reviewed each other's testimony.

16
17 Yet neither testimony attempts to reconcile the obvious contradiction of saying
18 (paraphrasing): (i) minimizing electric rates is important, particularly for
19 vulnerable customers, but (ii) don't evaluate DSM options using the only cost-
20 effectiveness test that is designed to identify the option that is best in regard to
21 electric rate impacts. As a result, I found both the contradiction in their

¹⁵ A more beneficial impact means a greater reduction, or a lower increase, in electric rates.

1 testimonies, and the omission of any attempt by the witnesses to reconcile the
2 contradiction, interesting and concerning.

3 **Q. Are witness Rábago’s statements urging the FPSC to reject FPL’s proposal**
4 **to reduce the monthly incentive payment to CDR and CILC participants**
5 **needed to return the programs to cost-effective status, and to order FPL to**
6 **aggressively increase program enrollment (Page 25, lines 15-17), consistent**
7 **with his concerns about the energy burden for Florida households (Page**
8 **26, lines 17-19)?**

9 A. No. Witness Rábago’s first tells the FPSC that it should not lower the incentive
10 payments to return a non-cost-effective DSM program to cost-effective status,
11 then it should “*aggressively*” sign up more participants using the current non-
12 cost-effective monthly payments. The result of doing so will be to further
13 increase ECCR clause charges and put even more upwards pressure on electric
14 rates for all customers, including the very customers he expresses such concern
15 for. These energy burdened customers, and FPL’s other customers who are not
16 participants in the CDR and CILC programs, would then be subsidizing – to an
17 even greater extent than they are now – the large commercial/industrial
18 customers who are CDR and CILC participants.

1 **Q. Witness Whited claims that “a key reason” for electricity usage being high**
2 **in FPL’s service territory, compared to customer usage at other utilities, is**
3 **the level of utility investment in energy efficiency. (Page 19, lines 7-10).**
4 **Does she provide any support for this claim?**

5 A. No. Witness Whited offers no supporting documentation. One would have
6 thought that her singling out “*utility investment in energy efficiency*” as “*a key*
7 *reason*” for higher usage meant that she had performed a comparative analysis
8 of the major drivers of load at FPL and other utilities. If she has not done such
9 an analysis, it is hard to see how she can credibly designate utility energy
10 efficiency - or any other factor - as “*a key reason*” for the level of usage by
11 FPL’s customers.

12
13 For example, how large a “driver” of FPL’s load is the amount of cooling degree
14 days (“CDD”)¹⁶ that customers face each year in FPL’s service territory? To
15 see how much CDD values vary from one utility to another, Figure SRS-9
16 below compares CDD values for Miami versus a number of cities in the Eastern
17 U.S. that witness Whited presents in an exhibit in her testimony. The reported
18 values are for the years 2016 through 2020.

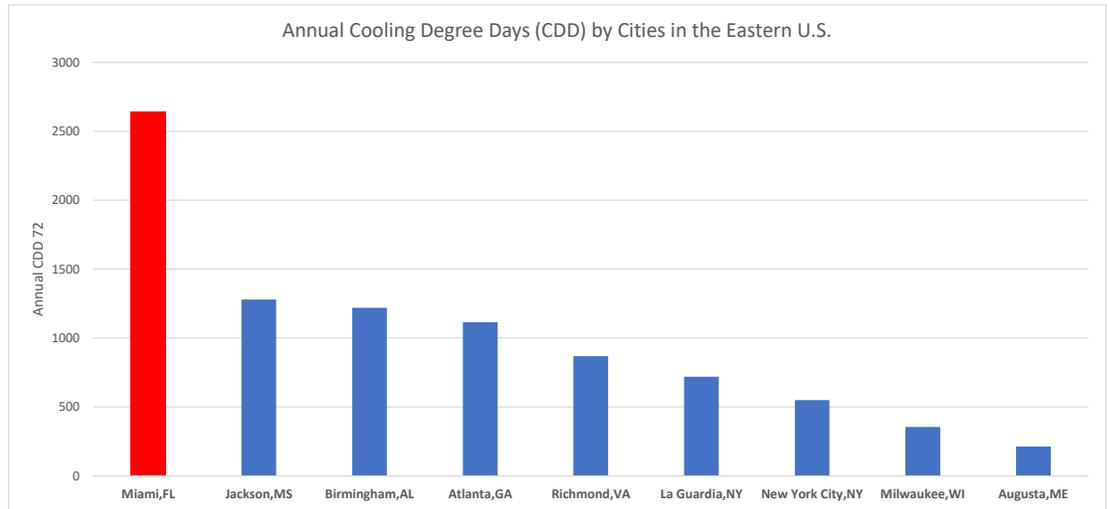
¹⁶ Cooling degree days (“CDD”) essentially measure how hot the air temperature is. It is calculated on an annual basis by subtracting 72 degrees from the average daily temperature for each day, then summing those daily differences for the entire year. CDD can be considered an indication of the total air conditioning or cooling load for a customer or a utility.

1

Figure SRS-9

2

Comparison of Cooling Degree Days in Cities in the Eastern U.S.¹⁷



3

4

5

As indicated in the figure, Miami (and FPL’s service territory) has a very high CDD value; *i.e.*, it has a much higher annual cooling load compared to the other areas shown. Even comparing the values for FPL’s area only to areas in the notably hot and humid Southeastern U.S. (such as Jackson, Birmingham, and Atlanta), FPL’s cooling load is higher by a factor of about 2.

10

11

Witness Whited would need to have conducted analyses of all of the main drivers of electrical load for different utilities, including CDD values, before a claim such as the one she made could be supported.

12

13

¹⁷ The source of this CDD data is <https://www.degreedays.net>.

1 **Q. Witness Wilson discussed “stranded assets” in her testimony and claimed**
2 **that new and existing gas plants are likely to become stranded assets (Page**
3 **26, lines 9-13). Do you agree?**

4 A. No. Her testimony indicates she is aware of, and acknowledges, the high level
5 of uncertainty that underlies any discussion of gas units becoming stranded
6 assets. And, as previously explained in the discussion of why CTs were selected
7 for the Gulf area, resource options are not evaluated solely on the basis of
8 economics, but also based on considerations of system reliability and system
9 operation.

10

11 Furthermore, as discussed in FPL witness Valle’s direct testimony, FPL is
12 planning to test the ability of a CT component of an existing CC unit to utilize
13 solar-generated hydrogen as a fuel in a pilot facility planned to go in-service in
14 late 2023. If the lessons learned from the construction and operation of the
15 hydrogen pilot ultimately lead to a conclusion that existing CC units can be
16 successfully converted to utilize renewable energy-generated hydrogen, then
17 possible concern over a long and useful life for CC units will have been
18 minimized or eliminated.

1 **III. CONCLUSIONS**

2

3 **Q. Would you please summarize your review of the intervenor witnesses’**
4 **testimony?**

5 A. Yes. I summarize my review of their testimonies by noting the intervenor
6 witnesses:

- 7 - Did not perform any modeling analyses of the FPL, Gulf, and/or integrated
8 FPL/Gulf systems in an attempt to support their statements and
9 recommendations;
- 10 - Did attempt inappropriately to turn this docket into a DSM goals
11 proceeding; and,
- 12 - Did make many inaccurate, misleading, and/or contradictory statements in
13 their testimonies.

14

15 As a result, I conclude that these witnesses have no credibility for the purposes
16 of this docket. As a result, their recommendations in this docket should be
17 rejected.

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

19 A. Yes.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
1	Pollock	60/9	<i>“Determining the cost-effectiveness of a rate is different from determining whether a particular DSM or load management program should be offered or expanded. The former is a ratemaking issue, while the latter is a resource planning issue.”</i>	CDR and CILC are DSM programs, not simply electric rates and cost-effectiveness analyses of DSM programs must follow established guidelines and principles. FPL's analyses followed those guidelines and principles.
2	Pollock	61/6	<i>“When used in the context of evaluating non-firm service, the reasonableness of any non-firm rate can be assessed by determining whether the utility has actually avoided constructing new capacity and quantifying the costs associated with this avoided capacity.”</i>	As DSM programs, the cost-effectiveness of CDR and CILC is analyzed by comparing the programs to future generation that could potentially be avoided or deferred, not by looking backwards to generation already built or previously avoided or deferred.
3	Pollock	63/4	<i>“...the AURORA model captures not only changes in fixed costs, but also the variable costs associated with future resource plans. However, <u>the primary benefit of the CDR and CILC load management programs is to reduce future capacity additions</u> that result in lower fixed costs. Thus, FPL’s use of the AURORA model introduces other variables besides the impact on future capacity additions and fixed costs that are unrelated to determine the cost-effectiveness of the CDR and CILC programs.” (emphasis added)</i>	The FPSC's approved cost-effectiveness methodology for analyzing DSM programs accounts for all projected, reasonably identifiable cost impacts related to DSM, both avoided and incurred, that are reflected in electric rates under which all customers are served. These cost impacts include both fixed and variable costs. FPL's analyses of the CDR and CILC programs, using both the FPSC's approved cost-effectiveness methodology and the AURORA model, correctly accounted for both fixed and variable cost impacts. In addition, the underlined text contradicts the previous (2) statement above.
4	Pollock	66/13	<i>“If that additional capacity had been installed over the period 2012 through 2021, FPL would have incurred an average installed cost of additional capacity of about \$667 per kW (excluding solar capacity), as shown in Exhibit JP-13. Using \$667 per kW as the average installed cost of incremental capacity, the annual cost avoided by a transmission level customer taking non-firm service was approximately \$9.78 per kW per month.....This is higher than the current \$8.70 per kW CDR Monthly Incentive.”</i>	This approach to determining CDR and CILC incentives is incorrect for at least the following reasons: (i) it accounts only for installed costs, (ii) it looks at installed costs for generation already built which is, by definition, not avoidable/deferrable by DSM, and (iii) the list of generation units includes types of generation that are not appropriate for use as an avoided unit for FPL's system.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
5	Georgis	19/13	<i>“Applying <u>FPL’s methodology</u> of projected changes in costs and values for capacity, the CDR credit should be increased to \$10.07 per kW-month to reflect the average change in value over the four-year proposed rate plan.”</i> (emphasis added)	This witness' approach to determining CDR and CILC incentives is not " <i>FPL's methodology</i> ". In addition, this witness' approach is incorrect for at least the following reasons: (i) it accounts only for installed costs, (ii) it looks at projected installed costs for generation in SERC-SE, not for FPL, and (iii) it takes the projected cost annual escalation rates for this non-FPL generation and applies that escalation to the already non-cost-effective incentive for CDR and CILC.
6	Pollock	62/5	<i>“Cost-effectiveness test are used in the conservation goals dockets to determine the maximum level of non-firm load; specifically whether a new DSM or load management program should be implemented and/or whether an existing program should either be expanded or closed to new business.”</i>	This is an incomplete view of why DSM cost-effectiveness analyses are performed. These analyses also are used to determine: (i) whether a non-cost-effective program should be cancelled, and (ii) whether program costs, usually incentive payments, can be lowered to return the program to cost-effective status. The latter action is what FPL proposes in this docket for the non-cost-effective CDR and CILC programs.
7	Pollock	65/14	<i>“Dr. Sim assumes that reducing the incentives to the levels that customers were paid in the distant past would have no adverse consequences; that is, customers would not be motivated to switch from non-firm to firm service. However, he has not provided any customer survey assessing potential customer impacts of a 33% reduction in the CDR and CILC incentives.”</i>	No survey of either the few hundred CDR & CILC participants, or of the approximately 5 million non-participants who are now paying millions per year in non-cost-effective CDR & CILC incentives, is needed. The issue is simple: the programs are no longer cost-effective and action needs to be taken. In addition, 100% of the CILC participants, and 75% of the CDR participants, signed up for the programs when the incentive level was only 80% of what FPL is proposing as the new incentive level that will return the programs to cost-effective status.
8	Pollock	66/2	<i>“... CDR and CILC participants have to incur costs to be able to safely curtail load when notified. Reducing the incentive payments by 33% substantially changes the customer’s assessment of the risks and benefits of the programs. If the participants believe that the benefits of remaining on non-firm service will be substantially reduced and are no longer justified by the risks, as FPL is proposing in this case, they may decide to convert to firm service.”</i>	100% of the CILC participants signed up for the program 20 or more years ago. 75% of the CDR participants signed this program 10 or more years ago. Therefore, any major capital expense needed for them to safely curtail load would have been spent at least a decade ago and would now be a sunk cost. In addition, any back up generation that was installed as a result of the programs is also useful to maintain operation during/after storm outages, thus making it unlikely that program participants would cease annual maintenance costs for the equipment once the incentives are lowered.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
9	Whited	7/6	<i>“FPL should implement innovative programs...such as...school bus vehicle-to-grid pilots that could provide back-up power.”</i>	FPL already has an operational school bus vehicle-to-grid pilot program.
10	Whited	8/11	<i>“Vulnerable customers are more likely to face difficulties paying their bills due to higher electricity rates...”</i>	This statement is inconsistent with, and contradictory to, other intervenor testimony that calls for dropping the only DSM cost-effectiveness test (the RIM test) that identifies DSM programs that have a worse impact on electric rates than the generation options with which the DSM programs compete.
11	Whited	19/7	<i>“Electricity bills are generally higher in FPL’s territory because electricity usage is higher than in many other utilities’ territories. There can be numerous reasons for differing usage levels, but one <u>key reason</u> is utility investment in energy efficiency.” (emphasis added)</i>	The witness offers no support for this statement. To do so, the witness would have to have determined all major drivers of electrical load for FPL and other utilities, then compared the impacts of those drivers with the projected impact of utility DSM programs. She has not done so, nor has the witness considered the role that Florida's cooling load - which is twice that of other Southeastern states - plays in electricity usage levels of FPL's customers.
12	Pollock	8/33	<i>“Changes in variable costs are not relevant. In fact, the Commission has always used avoided generation capital costs to determine whether it is cost-effective to implement, expand, or close a load management program.”</i>	The FPSC's approved cost-effectiveness methodology for DSM analysis does not solely look at generation capital costs. Instead, it also accounts for other fixed costs as well as variable costs.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
13	Pollock	60/4	<i>"...the AURORA model quantifies both fixed (i.e., capacity) and variable (i.e., energy) costs. Thus, AURORA is the wrong tool to measure the cost-effectiveness of load management programs."</i>	To the contrary, it is because the AURORA model quantifies both fixed and variable costs that makes the model an appropriate tool with which to measure the cost-effectiveness of DSM and/or supply options. By addressing both fixed and variable costs, the approach with the AURORA model is consistent with the approach taken with the FPSC's approved cost-effectiveness methodology which does account for both fixed and variable costs.
14	Pollock	62/9	<i>"Q. Has the Commission ever used a production cost simulation model to evaluate cost-effectiveness? A. No."</i>	The statement may be true by default (because the FPSC does not, to FPL's knowledge, use production cost simulation models). However, the FPSC's approved cost-effectiveness methodology for evaluating DSM uses the same basic approach of accounting for both fixed and variable costs that is used in models such as AURORA.
15	Pollock	64/17	<i>"...I have provided a history of CONE prices published by MISO in its annual PRA. The CONE prices shown reflect the cost to construct a new CT in MISO local resource Zone 9, which includes Louisiana, Mississippi and Texas (along the Gulf Coast). As can be seen, the CONE prices have varied over time. However, <u>there is no discernable decline ...</u>" (emphasis added)</i>	Using the same values from 2013-2014 to 2019-2020 that the witness used in his calculation, a graph of the annual values shows a distinct overall decline in costs over the time period. For example, the cost value for 2013-2014 is \$96.86 while the cost value for 2019-2020 is \$82.86.
16	Georgis	18/16	<i>"Q. Using <u>Mr. Sim's methodology</u>, could these projections be applied to calculate the CILC/CDR credit values in <u>FPL's calculation methodology</u>?" (emphasis added)</i>	The methodology this witness is discussing is neither FPL witness Sim's, nor FPL's, methodology. The approach used by this witness is an incorrect way in which to attempt to determine appropriate incentive levels for the CDR and CILC programs.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
17	Pollock	57/2	<i>"Q...Is FPL proposing to reduce incentives paid under other non-firm load options in this proceeding? A. No, not to my knowledge."</i>	Modifications to DSM programs, such as changes in incentive payments, are typically addressed in a DSM proceeding which is the appropriate forum for DSM-related issues. FPL attempted to lower the CDR incentive payments in the 2020 DSM Plan filing. However, the FPSC directed FPL and other parties that this issue would be moved to FPL's next base rate case; <i>i.e.</i> , to this docket.
18	Pollock	63/12	<i>"The accuracy of the AURORA model results cannot be verified without conducting a detailed audit."</i>	The AURORA model is a commercially available optimization/production costing software that is widely used in the U.S. by electric utilities in their resource planning work. As such, it has undergone extensive scrutiny by these utilities and by state public utility commissions who review the results of AURORA-based analyses brought before them by these utilities. In addition, FPL conducted months of side-by-side analyses using AURORA and its former planning software (EPRI's EGEAS model) and found the results of the two models were comparable.
19	Rábago	10/2	<i>"The Commission should direct the Company to stop relying on the RIM as the primary screen for energy efficiency cost-effectiveness... "</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, the RIM test is the only DSM cost-effectiveness test that provides a true 'apples-to-apples' comparison of DSM and supply options that accounts for all cost impacts to the utility system that are reflected in electric rates.)
20	Rábago	10/6	<i>"The Commission should direct the Company not to use the two-year payback screen on energy efficiency programs... "</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, the two-year payback screen is a logical and simple method with which to address free riders as required in Florida analyses of DSM when setting DSM goals.)

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
21	Wilson	12/9	<i>"Xcel Energy's most recent integrated resource plan in Minnesota proposes annual energy efficiency savings levels of approximately 2.5%..."</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, the issue of setting DSM goals on a ratio of DSM energy saved as a percent of energy sold is one that has twice been brought before the FPSC in DSM Goals docket, and the FPSC has twice rejected it.)
22	Wilson	10/9	<i>"An analysis by Lawrence Berkeley National Laboratory...finding that the average cost of kWh saved by energy efficiency (EE) programs ...is 2.5 cents per kilowatt-hour(kWh). In contrast, NextEra (FPL's parent company) projects a range of 3.0 to 4.5 cents per kWh for new combined cycle units."</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, the concept of attempting to make a decision regarding competing resource options, whether DSM or supply options, on a \$/MWh basis is fundamentally flawed because a number of significant system cost impacts are not accounted for in this approach. Those fundamental flaws were previously described in FPL witness Sim's rebuttal testimonies in 4 previous FPSC filings referenced in witness Sim's rebuttal testimony in this docket.)
23	Rábago	25/10	<i>"...the Company proposal marks another disappointing chapter in the Company's war on cost-effective energy efficiency..."</i>	To the contrary, FPL is an advocate of DSM that is cost-effective for all customers; i.e., DSM programs that provide benefits to program participants and do not put upwards pressure on electric rates for all other customers.
24	Rábago	24/22	<i>"...Company witness Sim inaccurately asserts that the RIM analysis is a cost-effectiveness evaluation. It is not. "</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, the RIM test is not only a valid DSM cost-effectiveness test that has been recognized and used for years across the U.S., its use is required in the State of Florida. And, from a resource planning perspective, it is the only DSM cost-effectiveness test that allows a true 'apples-to-apples' comparison of DSM and supply options that accounts for all cost impacts to the utility system that are reflected in electric rates.)

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
25	Rábago	24/25	<i>"...Mr. Sim incorrectly asserts that the Total Resource Cost, under which the cost-effectiveness of the CDR program is an astounding 49.36, does not account for utility costs. It does."</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, FPL witness Sim did not make the assertion that this witness claims. Instead, FPL witness Sim stated, correctly, that the TRC test does not account for utility incentive payments to program participants.)
26	Rábago	26/21	<i>"...the state...continues the counter-productive practice of treating all energy savings as lost revenues."</i>	The attempt to introduce this DSM-related issue into this docket is inappropriate because DSM is not a major factor in the analyses with which FPL is supporting its filing in this rate case. (In addition, Florida does not 'treat all energy savings as lost revenues' as this witness claims. Florida correctly accounts for the fuel and environmental compliance cost savings that result from MWh reductions. In addition, from the RIM test perspective of accounting for electric rate impacts, Florida correctly accounts for unrecovered revenue requirements that result from reductions in MWh sales.)
27	Rábago	19/1	<i>"...appears to have been necessitated by the fact that the new NFRC line creates a new single-contingency risk relating to power transfers from the FPL service territory to the Gulf Power service territory. "</i>	The new CTs in the Gulf area were selected first on the basis of economics only and strongly supported from a system reliability and operations perspective to deal with the potential contingencies of unexpected loss of the large Lansing Smith Unit 3 CC unit, the NFRC, and/or (through mid-2023) the Shell PPA capacity.
28	Rábago	19/21	<i>"...the timetable was accelerated to mitigate the risk of a failure of the NFRC line..."</i>	The new CTs in the Gulf area were accelerated to deal with the potential contingencies of unexpected loss of the large Lansing Smith Unit 3 CC unit, the NFRC, and/or (through mid-2023) the Shell PPA capacity.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
29	Rábago	19/7	<p style="text-align: center;"><i>"The Company is also proposing <u>costly upgrades</u> to existing combined cycle units (including Lansing Smith) and conversion of coal units at the Crist facility."</i> (emphasis added)</p>	<p>To the contrary, both the Lansing Smith Unit 3 upgrade and the Crist coal-to-gas conversion are projected to result in significant CPVRR net savings for customers even after accounting for the cost of the projects: \$41 million for the Lansing Smith Unit 3 upgrade, and \$236 million for the Crist coal-to-gas conversion, or \$277 million CPVRR net savings for the two projects combined.</p>
30	Rábago	22/4	<p style="text-align: center;"><i>"...the Company never faces any real financial consequences for building power plants that become obsolete or uneconomic long before the end of their useful lives."</i> (emphasis added)</p>	<p>All but two of the generation units that FPL plans to retire in its resource plan have been operating for more than 40 years and some have been operating for 66 years. The two exceptions are: (i) an uneconomic coal unit that will have been operating for 33 years, and (ii) a trio of small (4 MW each) CTs that will have been operating for 26 years. In addition, only two of the to-be-retired units are projected to operate at a capacity factor of even 10%. All of the other units are projected to operate with single digit capacity factors. The low capacity factor projections indicate that these units are no longer economic to operate on a regular basis.</p>
31	Rábago	25/15	<p style="text-align: center;"><i>"The Commission should deny the Company proposal to reduce the compensation rate for the CDR and CILC programs and order the Company to aggressively pursue program enrollment growth."</i></p>	<p>By this statement, the witness is advocating to not fix a non-cost-effective DSM program (that can easily be returned to cost-effective status), and to sign up more participants in the non-cost-effective program. If these recommendations are followed, ECCR charges paid for by all customers will increase and upward pressure on electric rates will increase from this non-cost-effective DSM program.</p>
32	Rábago	26/17	<p style="text-align: center;"><i>"Large percentages of Florida households are energy burdened, some severely so, and average burdens are higher for customers that are Black, Latinx, and elderly. "</i></p>	<p>This statement, which attempts to point out that harm is caused to energy burdened customers from poor DSM decisions, is inconsistent with, and contradictory to, his previous statement that urges the FPSC to: (i) keep non-cost-effective CDR and CILC incentives high, and (ii) sign up increasing numbers of participants in these non-cost-effective DSM program. If this were done, the energy burdened customer, and all other customers, would be further burdened. In addition, these energy burdened customers would further subsidize the large commercial and industrial customers who participate in these programs.</p>

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
33	Wilson	8/6	<i>"FPL's planning process is biased toward gas-fired resources."</i>	FPL has no bias towards or against any resource option whether supply or DSM option. Its resource planning process is agnostic regarding what types of resource options emerge as the best selections from the resource planning analyses. In addition, the results from the current Steps 1 through 3 analyses show the following (approximate) net changes for the years 2021 through 2030: an increase in solar of 10,000 MW, an increase in batteries of 1,100 MW, and a reduction in gas-fueled resources of 100 MW. (These values are easily discernable in FPL's filing in this docket and in FPL/Gulf's 2021 Ten Year Site Plan.)
34	Wilson	15/9	<i>"The Company did not examine an option in which the Crist Units were retired..."</i>	FPL did examine the option of retiring the Crist Units 6 & 7 twice during the course of its Steps 1 through 3 analyses as described in FPL witness Sim's rebuttal testimony.
35	Wilson	16/5	<i>"FPL...provided little analysis that the coal-to-gas conversion was in the best interest of ratepayers."</i>	FPL's analyses showed a projected net savings to customers of \$236 million CPVRR for the coal-to-gas conversion project even after accounting for the cost of the project.
36	Wilson	17/5	<i>"The Initial Step 1/Step 2 analyses were done in late 2018/early 2019. FPL then updated its analyses in late 2020/early 2021, referred to as the Current Analysis," updating various forecasts and assumptions. It did not, however, reevaluate the decision to add the new CTs, instead locking those resources down as common amongst all cases analyzed. Solar prices declined over that time period, making them a more cost-competitive resource addition."</i>	The decision to add the new CTs to the Gulf area was made based on economics and with system reliability/operations-based support. In regard to the latter, the Gulf area has only 44 MW of fast start/longer duration resources (and these will be retired soon). Thus the Gulf area needs fast start/longer duration resources to help ensure reliable system operations during a myriad of possible circumstances. Solar resources cannot provide this capability regardless of their cost. And, in regard to declining solar costs, when forecasts were updated, the forecasted prices for natural gas significantly declined.

**Inaccurate, Misleading, and/or Contradictory Statements
 Made by Intervenor Witnesses**

Item	Witness	Starting Page/Line	Inaccurate, Misleading, and/or Contradictory Statement	Correct Information
37	Wilson	20/6	<i>"Standalone battery storage, or storage paired with solar, could have provided the same capacity...than the new CTs."</i>	If batteries (regardless of how they are charged) are of sufficient duration, they can appear - on paper - equivalent to CTs on a MW to MW basis, such as in reserve margin calculation. However, in actual operation, once batteries have discharged their design limit of energy, they are no longer able to assist in meeting high load/system emergencies if those circumstances still exist. Furthermore, recharging the batteries means the batteries have become another electric load on the utility system. Thus, for longer term high load/system emergency circumstances, batteries are not equivalent to CTs which can operate continuously for long periods of time.
38	Wilson	8/1	<i>"The Commission should require FPL to incorporate its currently approved levels of DSM savings into the Company's load forecasts over its long-term planning horizon..."</i>	In the last (2019) DSM Goals docket, the FPSC decided, based at least in part on the continuing trend of declining DSM cost-effectiveness, and the fact that most of FPL's and Gulf's current DSM programs are no longer cost-effective, to set DSM goals only through the year 2024. They did not set goals, as originally intended, beyond 2024. To assume that the FPSC will continue to set the same annual goals for non-cost-effective DSM programs through FPL's resource planning horizon (2068), is illogical. Instead, FPL assumed the FPSC's DSM goals through 2024, then used its projection of cost-effective DSM through 2030.
39	Wilson	26/9	<i>"Recent trends show that it <u>can be</u> cheaper today to build new renewable-plus-storage units than to build new gas plants. Forecasts <u>suggest</u> that in the future, it will be cheaper to build new renewables-plus-storage units than to continue operating existing gas plants. This means that new and existing gas plants are <u>likely to become</u> stranded assets. " (emphasis added)</i>	The carefully worded statement indicates this witness recognizes, and acknowledges, the uncertainty inherent in suggesting that gas-fueled units will become stranded assets in the future. In addition, FPL plans to have a solar-generated hydrogen pilot project in operation by the end of 2023 at an existing CC unit. If this pilot shows that, in the future, it is possible to successfully operate gas-fueled generating units on solar-generated hydrogen, then possible concern over a long and useful life for CC units will have been minimized or eliminated.