BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In the Matter of:

DOCKET NO. 20170225-EI

PETITION FOR DETERMINATION OF NEED FOR DANIA BEACH CLEAN ENERGY CENTER UNIT 7, BY FLORIDA POWER & LIGHT COMPANY.

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PROCEEDINGS: HEARING

COMMISSIONERS PARTICIPATING: CHAIRMAN ART GRAHAM
COMMISSIONER JULIE I. BROWN
COMMISSIONER GARY F. CLARK

DATE: Wednesday, January 17, 2018

TIME: Commenced: 9:30 a.m.
Concluded: 1:05 p.m.

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

REPORTED BY: DEBRA R. KRICK
Court Reporter

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

APPEARANCES:

WILLIAM P. COX and KEVIN I.C. DONALDSON, ESQUIRES, 700 Universe Boulevard, Juno Beach, Florida 33408-0420; and MICHAEL MARCIL, ESQUIRE, GUNSTER YOAKLEY Law Firm, 450 E. Las Olas Boulevard, Fort Lauderdale, Florida 33301, appearing on behalf of Florida Power & Light Company.

J.R. KELLY, PUBLIC COUNSEL; and PATRICIA CHRISTENSEN, ESQUIRE, Office of Public Counsel, c/o the Florida Legislature, 111 W. Madison Street, Room 812, Tallahassee, Florida 32399-1400, appearing on behalf of the Citizens of the State of Florida.

DIANA CSANK and JULIE KAPLAN, ESQUIRES; MICHAEL LENOFF, LEGAL FELLOW, 50 F Street, NW, 8th Floor, Washington, DC 20001, appearing on behalf of Sierra Club.

CHARLES MURPHY, STEPHANIE CUELLO, and RACHAEL DZIECHCIARZ, ESQUIRES, FPSC General Counsel's Office, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, appearing on behalf of the Florida Public Service Commission Staff.

KEITH HETRICK, GENERAL COUNSEL; MARY ANNE HELTON, DEPUTY GENERAL COUNSEL; Florida Public Service Commission, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, Advisor to the Commission.

I N D E X

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P R O C E E D I N G

CHAIRMAN GRAHAM: Good morning, everyone.

COMMISSIONER BROWN: Good morning.

CHAIRMAN GRAHAM: Come on, we can do a little better than that. Good morning.

I am glad you guys are all here safe and sound this morning. It's not a bad day today, but it's supposed to get a lot colder. So when we break for lunch don't be surprised, and when we leave for dinner, don't be surprised.

We will call this meeting to order. It's a hearing, and if I can get staff to read the notice.

MR. MURPHY: Yes, sir.

By notice issued December 18th.

CHAIRMAN GRAHAM: Speaker -- your mic. Your mic.

MS. HELTON: It's on.

MR. MURPHY: It's on.

CHAIRMAN GRAHAM: There you go.

MR. MURPHY: By notice issued December 18th, 2018, this time and place was set for hearing in Docket Number 20170225-EI Petition for Determination of Need for Dania Beach Clean Energy Center Unit 7 by Florida Power & Light. The purpose of this hearing is set forth in that

notice.

CHAIRMAN GRAHAM: Okay. Let's take appearances.

MR. COX: Good morning, Chairman Graham, Commissioners.

Appearing on behalf of Florida Power & Light Company, William Cox and Kevin Donaldson with FPL, and Michael Marcil with the Gunster Law Firm.

MS. CHRISTENSEN: Good morning, Commissioners. Patty Christensen with the Office of Public Counsel. And I would also like to put in an appearance for J.R. Kelly, the Public Counsel.

MS. KAPLAN: Good morning, Commissioners. I am Julie Kaplan with the Sierra Club, entering an appearance also for Diana Csank and Michael Lenoff.

MR. MURPHY: Chairman, Charles Murphy, Stephanie Cuello and Rachel Dziechciarz for the Commission staff.

MS. HELTON: And Mary Anne Helton. I am here as your advisor today. I would also like to make an appearance for your General Counsel, Keith Hetrick.

CHAIRMAN GRAHAM: Thank you very much.

Before we get to public testimony -- and we are taking public testimony out of order a little

bit today because we have somebody with a special need so I agreed to accommodate her. I am going to give you an idea of what to expect today.

We are probably going to take a break about 12:45, one o'clock today for lunch. We will probably stop sometime around 7:00-ish, whenever is a good break point, tonight. So there won't be a dinner break. We will just be done at 7:00. And we want to start tomorrow at 9:00.

And once again, tomorrow we will take a lunch break at 1:00, and we will take a dinner break at 7:00, but we need to finish tomorrow because tomorrow is our last day, so we will go as late as we need to.

Is there any questions or concerns about the schedule?

Okay. Let's go to public testimony.

I am going to have to swear everybody in, correct?

MR. MURPHY: Yes, sir.

CHAIRMAN GRAHAM: If you plan on giving public testimony today, if I could get you to stand and raise your right hand, please.

(Whereupon, persons providing public testimony were sworn.)

CHAIRMAN GRAHAM: Thank you.

MR. COX: Chairman Graham, could FPL be heard for one moment before the public testimony begins?

CHAIRMAN GRAHAM: Sure.

MR. COX: Thank you.

We would just ask, before each person speaks, if at the could identify whether they are a Sierra Club member. And we would just note for the record that Sierra Club is already represented in this matter.

CHAIRMAN GRAHAM: Okay. Thank you.

We are going to limit each one of the speakers to three minutes.

Ms. Clark, are you there? Maggie Clark? Is she on the phone? I am sorry, is she here? Is Ms. Clark not here?

Now, the whole reason why we are taking this early is because --

MR. MURPHY: That's right. She -- she called yesterday and was expecting to be here.

CHAIRMAN GRAHAM: She was not expecting to be here?

MR. MURPHY: She was expecting to be here.

CHAIRMAN GRAHAM: Okay. Let's start with everybody else, and if she gets here before we

close public testimony, we will allow her to speak.

Next is Emmanuel George. You need to come up here to the microphone. Give your name and address for the record, and you have three minutes, sir.

MR. GEORGE: Hi, everybody. How y'all doing today?

My name is Emmanuel George, 17 Northeast Second Avenue, Apartment 106, Dania Beach, Florida. And basically I have been living in South Broward, Dania Beach, Florida, for about 15 years, or going on 16, since 2002. And I have been canvassing the community for about a week and a half or so now and talked to over 250 people, and many people are not aware of the proposed fracking issue, and it's very problematic to push something in which people do not really even know about. And as well as the potential of this increasing one's electric bill. And in Dania Beach, we are just dealing with a lot of issues right now.

A lot of justification is happening. They are building an $800 million development known as the Dania Point Shopping Mall. They are building on the US 1 corridor, expanding the Ft. Lauderdale airport, as well as building more shopping plazas, all within by the northwest quadrant. And this is

very problematic, and the issue with the FPL fracking just adds another layer to it.

Many people you are not aware because we are already dealing with so much stress as is. And just in the yearly cost going up to $120 a year on their electric bill is very problematic because many people are already dealing with a lot of poverty. I am specifically speaking to the northwest quadrant where people who look like me reside. And overall, you know, I am just saying that, for something like this to be pushed, there needs to be a better communication going on between both sides.

And that's pretty much what I am speaking for, and the economical aspect, and just no community input, really. So I just feel that people need to -- it needs to be a way better form of communication. And that's pretty much my stance.

CHAIRMAN GRAHAM: Thank you, Mr. George.

Any questions? Ms. Brown.

COMMISSIONER BROWN: Thank you, Chairman Graham.

Mr. George, thanks for many coming up here today from Dania Beach. You said you were canvasing the neighborhood. Was that on behalf of

any of particular group?

MR. GEORGE: I mean, I been doing community-based work since 2014. I am very passionate about doing work in the community., I have my own little movement called Black Broward, which is unifying black communities and Broward County. I also am a film director, and I use film as a way to educated the youth and teach people about their history.

So overall, I am -- and plus I am on the committee for the City of Dania Beach. I am on the Mural Committee and CAC Committee. So I am just overall involved period. I am not tied into any organization or social justice organization. I am just here speaking on behalf as a resident, a taxpayer who is concerned.

COMMISSIONER BROWN: Thank you.

CHAIRMAN GRAHAM: Thank you, sir.

Steven Jones, Junior.

Welcome, sir.

MR. STEVEN JONES: Great rising to the Commission board and the people.

My name is Steven Jones, Junior. I am 23 years old. I am a resident of Dania Beach, Florida. And I am -- I came up here for the

concern -- the proposal of the frack gas issue that -- well, let me start over. Let me start over.

Dania Beach is the first black community and city, so my family, my great-grandma came, like, in 1940s. So all of my family members are over in this area. So them proposing to frack gas is bad for our economic -- I mean, our economy and -- I mean, not economy, but economics, and bad for the area and the pollution. So I really want to push for more solar power instead of frack gas. We don't want them importing it either.

That's it.

CHAIRMAN GRAHAM: Okay. Thank you, sir.

Any questions?

Thank you, Mr. Jones, for your testimony.

Next is John Jones.

Sir, welcome.

MR. JOHN JONES: How you doing? Good morning, everybody.

I am John Jones. My address is 2327 Cody Street, Hollywood, Florida. Which is right by Dania Beach.

I have been a resident of Dania Beach my whole life also, so that is my family, my grandparents,

their grandparents, and so forth, basically since the community started. So we -- we have witnessed a lot of change in the community from good to bad, you know, up and down, you know. So even doing some research on frack gas, we have been canvassing the city with Emmanuel too. We all kind of work together in the community to speak for those who can't really get out here, who may have to work today, or even the younger kids coming up who may be a little ahead -- ahead of their age group, you know, we talk to them. We don't leave no -- no rock unturned, you know, we try to speak to everybody so we have a better base opinion on what we actually getting ourself into.

So just speaking to the community about this, a lot of them were opposed to it, you know, for whatever reason they had, you know. So we -- we did do a little research. We did document a couple of things about how -- you know, how they felt about it and what they had to say to be able to come up here and present it to you guys.

Now, the same thing to feed off of what Steve -- Steven was saying also, is that it is bad for the economy, not only the area that held the water, everything that's going on around us,

things. You know, people use this water to cook, shower in.

You know, we just had the little breakout with Ebola -- E. Coli, I am sorry, and the letters in there, and all of this stuff. So there is already a lot of things that -- that -- that is being affected. You know, and a lot of it's coming from decisions that we are making. It's not only as a community, as a nation, as a state, you know, individually.

So I mean, we made a few key points, you know, as far as, you know, FPL being one of the worst among the country in -- in situations like this, you know. So we figure the first thing that we can do to change that is to step up as a community, you know, maybe start from Broward. You know, we are all the way at the bottom, you know, to come all the way up here throughout these trips, you know, it would be times we probably stop and speak to other communities, or other counties, so we will have even a better base of what's going on.

But our whole idea is to come -- to actually be able to -- to make the voice of the people heard. So -- so we don't just go with -- like you say, just go with whatever they give us, because

actually we are the ones suffering from it.

So I believe that's it.

CHAIRMAN GRAHAM: Thank you, sir.

I have a question just to clarify.

You said that FPL was one of the worst among the country of what -- of doing what?

MR. JOHN JONES: As far as energy saving programs among low -- low income communities, which is that's -- that's the actual key word I was meaning to say, low income communities.

CHAIRMAN GRAHAM: So they are the -- in your opinion, they are the worst --

MR. JOHN JONES: Actually, that was --

CHAIRMAN GRAHAM: Go ahead. I am sorry.

MR. JOHN JONES: -- that was documented.

CHAIRMAN GRAHAM: Please, let's take that again just so -- I want to make sure it's clear.

MR. JOHN JONES: All right. FPL's energy saving programs for low income communities are almost the worst in the country. If you give me two seconds, I could tell you exactly where it was documented at.

CHAIRMAN GRAHAM: Please do.

MR. JOHN JONES: It was right -- this isn't even my paper. Sorry.

CHAIRMAN GRAHAM: That's all right, sir. I will let you look for it and come back afterwards.

MR. JOHN JONES: I got it right here.

CHAIRMAN GRAHAM: All right. Sure.

MR. JOHN JONES: Yeah, I apologize about that, but that would be in the American Council for an Energy Efficient Economy.

CHAIRMAN GRAHAM: American Council for Energy Efficiency --

MR. JOHN JONES: Economy.

CHAIRMAN GRAHAM: Economy. Okay. Thank you.

MR. JOHN JONES: All right. I appreciate that. You guys have a good one.

CHAIRMAN GRAHAM: All right. Our next speaker is Kirk Evans. Forgive me if I pronounced your first name incorrectly.

MR. EVANS: Good morning, everyone. It's actually Curtric, but I appreciate it.

My name is Curtric Evans. I am a 24-year-old male from Dania Beach, Florida. I am a Boston College graduate of four years, so coming back home to hear of the proposed fracking plant was kind of alarming to me. It's alarming in the sense of Dania is my home. I am sure you all can attest that anywhere that is home, you -- naturally, you

gravitate to want to protect it. As a slightly educated man myself, I have I feel like I have the obligation to speak on their behalf.

Another point that I do want to make. I know there are a lot of different cleaner aspects of obtaining energy, in a sense, solar being one that would not only provide jobs, but also give -- it would minimize the health hazard that is presented to the community with the fracking that is being proposed.

In terms of just the hazards, I feel like this -- this business is a business decision in a sense, because it's made strictly for the point of obtaining more funds, because we don't -- it's already proven that a plant isn't needed until, what, 2024. So to force one into action in 2022, it doesn't make much sense to me.

So I am here today to speak on behalf of those who can't be here, and also those who can't really verbalize their disdain on the decisions that's being made on their behalf.

CHAIRMAN GRAHAM: Thank you, Mr. Evans.

Any questions of Mr. Evans?

Commissioner Clark.

COMMISSIONER CLARK: Thank you, Mr. Chairman.

Mr. Evans, you keep referring to a fracking plant. Can you explain what a fracking plant is to me?

MR. EVANS: Probably a poor choice of words. I should have said the power plant that's being proposed in Dania Beach, Florida. I apologize.

COMMISSIONER CLARK: Okay. Thanks.

MR. EVANS: No worries.

CHAIRMAN GRAHAM: Thank you, sir. Thank you for your testimony.

The next speaker is Nancy Metayer.

MS. METAYER: Metayer.

CHAIRMAN GRAHAM: Metayer, I apologize.

MS. METAYER: No problem. Good evening -- good morning, everyone. My name is Nancy Metayer.

I am opposing this project because it locks us into decades of reliance on fracked gas when our communities and climate need us to be moving beyond dirty fossil fuels and toward clean renewable energy.

FPL sought special treatment through exemption from a competitive bidding process in order to pick a winner, fracked gas, which is not only -- which not only contributes to climate change, it continues Florida overreliance on fossil fuels.

Additionally, FPL lacks lack of investment in effective energy saving programs are not only costing communities more in the form of higher utility -- utility bills, but also costing community jobs.

FPL energy saving programs for low income communities are among the worst in the country. A report last year by the nation's lead energy saving experts, the American Council for an Energy Efficient Economy, single -- singled out just how bad FPL's programs are in Miami. For example, while the report focused on major cities, there is no reason to think that smaller cities in FPL's service area get better programs from FPL.

And the expansion -- the expanded plant would extend FPL's reliance on fracked gas by four decades, locking us into generations of dependence on fossil fuels that threaten our water, air, health and climate.

FPL claims it needs a plant to improve electric grid reliability, but multiple reports on reliability show power outages are due to -- due to the availability of power plants, but actual outages are mostly due to downed poles and wires connecting power plants to homes and businesses.

FPL estimates that the expanded plant will cost as much as 888 million just to build, not including what it will cost to operate and maintain it.

And moving into the environmental impacts, FPL's construction of fracked gas power plant makes climate change worse, meaning higher sea level rise, which we are ground zero of climate change; stronger hurricanes, which we experienced with Hurricane Irma; and hotter summers, which we experience every year record breaking temperatures.

Fracking is harming local communities in many ways, including more frequent and more severe earthquakes, contaminating drinking water and nosebleeds.

I hear have a list of community members, elected officials and other people who are very -- who really oppose this and stand firmly with the community in Dania Beach, and want to send a message to you all that they do not want this project. It's not that they do not want the expansion, they -- but they just want cleaner and renewable energies invested into Dania Beach Power Plant. So I have that for you guys here.

CHAIRMAN GRAHAM: Okay. I appreciate it. If you could put it just right there.

MS. METAYER: Sure.

CHAIRMAN GRAHAM: And I will get staff to come by and pick that up, and we will enter that into the record.

MS. METAYER: Okay. Any questions for me?

CHAIRMAN GRAHAM: Commissioner Brown.

COMMISSIONER BROWN: Thank you.

Thank you, Ms. Metayer.

MS. METAYER: Metayer.

COMMISSIONER BROWN: Metayer, for coming down here.

Earlier a gentleman alluded to a lack of notice among the community --

MS. METAYER: Yes.

COMMISSIONER BROWN: -- in Dania Beach. You have a lot of facts and figures that you mentioned here today.

MS. METAYER: Yes.

COMMISSIONER BROWN: How did you receive notice about this need determination?

MS. METAYER: So the Commission meeting, I am very involved in the community. Like Mr. George was saying, we are very heavily invested. I consider myself a climate advocate. So I am here in the community regularly. I am making sure that

we are -- South Florida is moving towards more of a resilient and stronger resilience -- building more resiliency towards climate change. And so this crossed my path and I thought this is an issue that my community should know about and should be well aware about.

COMMISSIONER BROWN: Thank you.

MS. METAYER: And most likely not everyone in Dania Beach knows that this is even happening.

COMMISSIONER BROWN: Thank you.

CHAIRMAN GRAHAM: Are you -- as Florida Power & Light asked, are you a member of the Sierra Club?

MS. METAYER: No, I am not.

CHAIRMAN GRAHAM: Okay. Now, it says here Broward Soil and Water Conservation District.

MS. METAYER: Yes.

CHAIRMAN GRAHAM: Are you a district representative for soil and water?

MS. METAYER: Yes.

CHAIRMAN GRAHAM: Okay. I just wanted to make sure we had that clear. Thank you very much.

MS. METAYER: Yes. Yes.

CHAIRMAN GRAHAM: And thanks for your -- thanks for your engagement in the community.

MS. METAYER: Thank you.

CHAIRMAN GRAHAM: All right.

MS. METAYER: Bye-bye.

CHAIRMAN GRAHAM: Okay. Maggie Clark, is she here yet?

Ms. Clark, come on up. And you got here after I swore everybody else in. If I could get you to raise your hand.

(Whereupon, Ms. Maggie Clark was sworn in to give public testimony.)

CHAIRMAN GRAHAM: Thank you.

MS. CLARK: I'm sorry. My New Year's resolution was to not be late, so I made it, I think, 17 days. I am sorry. Tomorrow is a new day, though.

Okay. Good morning. I am Maggie Clark, and I work for the Solar Energy Industries Association, SEIA. It's a national solar trade association. I oversee our organization's policy work in the Southeastern United States, and I manage a committee of member companies with a specific interest in Florida.

In a determination of need proceeding, regulators should encourage utilities to take an incremental approach to meeting generation reliability needs. Given how quickly solar prices

are falling, regulators should seriously consider whether adding an expensive generating asset that could be deferred or avoided with readily available utility scale solar plus storage technology is the best decision for Florida customers.

Ultimately the Commission does not have that market information available in this proceeding as a result of Florida Power & Light's choices about how to frame the power need, what assumptions to use, how to weigh different factors against each other and how to interpret the results. Solar power purchase agreement prices are falling to new lows and can now compete with energy sources on a purely economic basis.

Two examples to point to:

In Georgia, this year's winning solar procurement PPAs were signed at an average price of $36 per megawatt hour.

In Colorado, Xcel received median RFP bids of $36 per megawatt hour for solar PV with energy storage.

For Florida specifically, my member companies have supplied me with an estimated solar only 25-year PPA range of $31 to $34 per megawatt hour.

Solar PPAs have the benefit of locking in a

set price for decades, completely eliminating fuel price risk. By contrast, the vast majority of life cycle costs of the new natural gas power plant is the new cost of fuel. And natural gas prices are projected to increase over time, making energy from these resources more expensive.

Florida Power & Light has failed to properly compare the life cycle cost of its proposed project against competitively procured solar resources, leaving its customers guessing about their future bills.

Speaking of this specific proceeding, the solar energy understands that this may not be the ideal venue to ask the Commission to withhold approval in order to require more information on alternative resource costs.

We also believe that three minutes in a public comment period cannot fully articulate solar's benefits as a real alternative resource in this proceeding, or future generation procurements, and that means here request that the Commission issue a formal request for information for utility scaled solar and utility scaled solar plus storage projects to fully realize the prices that solar developers and my members can and are willing to

offer in Florida if given a fair opportunity to compete.

If the Commission prefers, we are happy to submit this in writing. Thank you.

CHAIRMAN GRAHAM: Thank you, ma'am.

Any questions?

Commissioner Brown.

COMMISSIONER BROWN: Thank you, Ms. Clark, for being here.

Can you go over those figures again?

MS. CLARK: Sure.

COMMISSIONER BROWN: You cited a Georgia decision, and also cite what case those are.

MS. CLARK: So the Georgia solar procurement is through their IRP process. Those bids -- it was an average price -- some were lower, some were higher, but the average price of the PPAs they signed earlier this year, at the end of 2017 to be constructed in 2018, are $36 per megawatt hour.

And then in Colorado recently, these figures were released, I think just two weeks ago, Xcel, the utility in Colorado, received a median RFP bid -- again some were lower, some were higher -- of $36 per megawatt hour for solar PVP paired with energy storage.

And then based on my member companies that surveyed, we -- they would be willing to offer --

COMMISSIONER BROWN: How many member companies is that?

MS. CLARK: I represent about 25 different member companies. And specifically, I would say 15 to 17 are very interested in Florida in trying to do work in the state.

COMMISSIONER BROWN: Are they currently doing work in the state?

MS. CLARK: Some of them of them are, yes.

COMMISSIONER BROWN: Are they doing at -- you gave a range of $31 to $34 per megawatt hour?

MS. CLARK: Yes.

COMMISSIONER BROWN: Are they doing it at that --

MS. CLARK: I mean, I don't think that they are given an opportunity to sign a PPA in Florida specifically with -- with those -- with this opportunity price range going forward in 2018.

COMMISSIONER BROWN: Anywhere else in the country are these members?

MS. CLARK: Yes.

COMMISSIONER BROWN: All right. Thank you.

CHAIRMAN GRAHAM: Thank you, ma'am. Thank you

for your testimony.

MS. CLARK: Thank you.

CHAIRMAN GRAHAM: Nancy, if I -- if I can get you to come back up to the microphone. I need to clarify something.

I know you said you are on the Solar Water Board. Are you here representing them or representing yourself?

MS. METAYER: I'm representing myself.

CHAIRMAN GRAHAM: Okay. I just wanted to make sure that was clear for the record.

MS. METAYER: Okay.

CHAIRMAN GRAHAM: Thank you.

MS. METAYER: Thank you.

CHAIRMAN GRAHAM: Okay. Staff, we are going to enter her exhibit as Exhibit 60 --

MR. MURPHY: Yes.

CHAIRMAN GRAHAM: -- is that right? Okay.

And do you have a title for that? I will take your suggestion.

MR. MURPHY: Concerned citizens --

CHAIRMAN GRAHAM: Concerned citizens of Dania Beach?

(Whereupon, Exhibit No. 60 was marked for identification.)

CHAIRMAN GRAHAM: Okay. Staff, preliminary matters -- oh, excuse me, before we get there, is there anybody else that I did not call that would like to speak in the public testimony for this hearing?

Okay. Thank you.

All right. Staff, preliminary matters.

MR. MURPHY: Should we give people an opportunity to object to the exhibit?

CHAIRMAN GRAHAM: Is there any objection to the exhibit? I haven't entered it yet. I just wanted to make sure we had it on the sheet.

MR. MURPHY: Okay. I just didn't -- I didn't know when you were going to do that.

CHAIRMAN GRAHAM: Okay.

MR. COX: No objection from FPL.

MS. CHRISTENSEN: No objection, OPC.

MS. KAPLAN: No objection from the Sierra Club.

CHAIRMAN GRAHAM: Thank you.

MR. MURPHY: Okay. Thank you.

As a preliminary matter, staff has a couple of pending -- or the Commission has a couple of pending confidentiality requests that we have not had an opportunity to address and will address

right after the hearing.

On the next matter, staff -- Sierra Club has filed a notice of intent to seek official recognition of several documents which FPL opposes, and this might be a good time to hear from the parties on the matter and maybe make a ruling, if necessary.

CHAIRMAN GRAHAM: Okay. I guess we will hear from Sierra Club first, and then from Florida Power & Light.

We will take -- we will give you five minutes to talk about this.

MS. KAPLAN: Sure. Good morning.

I think I would like to just go through specifically the documents. And, first of all, I would like to emphasize that they are all relevant to the proceeding. The -- all of them except for the first one, I believe, have to do with the alternative energy sources that are available, the competitiveness of solar, reliability issues. And they all also properly candidates for official notice.

The resolution of the City Commission of the City of Sarasota, specifically, commits to a transition of 100 percent renewable zero emission

energy sources. That is relevant both to Issue 6, which is based on other matters that are within the jurisdiction that the Commission may deem relevant.

Further, it's also relevant to Issue 2 related to renewable energy sources and technologies, or conservation measures that are reasonably available. It is a resolution of the City Commission of Sarasota, and, therefore, easily falls within the types of documents that qualify for official notice. Specifically, it's a duly enacted ordinance, a resolution of a municipality located in Florida.

Similarly, the California order, which orders PG&E to hold competitive bidding solicitation for energy storage, in part to manage voltage issues, and discusses the virtues of energy storage also bears on the potential for alternative energy in this case, and is a -- falls within subsection (5) of 90.202 official actions of the executive of any state.

The NERC documents, North American Electric Reliability Corporation, deal with topics ranging -- the first one under C deals with the fuel diversity and associated risks. The second one under D, similarly talks about the extent to

which FRCC depends on gas as compared to other jurisdictions.

And those two documents also fall within the discretionary provisions of 90.202 under subsection (12), facts that are not subject to dispute because they are capable of accurate and ready determination by resort to sources whose accuracy cannot be questioned. It's a, you know, publication of a well-respected entity that is -- has government affiliations.

And turning to the National Energy -- Renewable Energy Laboratory, under E, that likewise is relevant. It addresses price trends and declines for solar, which, again, is a crucial issue in this case.

The second document -- excuse me. Under F, we see the demonstration of essential reliability services of solar; again, talking about how solar provides reliability benefits.

And the last one, under G, similarly talks about solar PV cost reductions and the dynamic changes in the electric sector since 2010. Again, a crucial issue in this case that bears on the requirement to seriously consider these types of alternatives as opposed to the Dania Beach Energy

Center.

And similarly, that -- those documents should qualify for official recognition under 90.202, facts not subject to dispute because they are capable of accurate and ready determination by resort to sources whose accuracy cannot be questioned.

CHAIRMAN GRAHAM: Thank you, ma'am.

MS. KAPLAN: Thank you.

CHAIRMAN GRAHAM: Florida Power & Light.

MR. COX: Thank you, Chairman Graham and Commissioners.

Official recognition is -- is not intended to be a mechanism by which a party can simply produce evidence without a sponsoring witness, and it's not a recognized thing under Commission precedent in Florida law where a party can, on the eve of the hearing, data up -- data up a bunch of analyses and reports into the record. You know, it has -- it's clearly laid out in the Florida Statutes, in Rules of Evidence. The Commission has followed that consistently over the years.

Things like relevant laws, orders, decisions from state and federal agencies, federal government, state government. And it also includes

municipal resolutions. But they also have to be relevant to the case. They can't just be any type of law, any type of resolution, any -- right? They need to be something that's pertinent to the case if the Commission is going to stake official recognition, because under Section 90.202, for matters which -- I stress the words may be judicial live noticed, or officially recognized, it is up to the Commission's discretion whether to do that.

And let me walk through the ones that have been provided with the list.

Exhibit A, the resolution from the City of Sarasota for its 100 percent renewables goal by 2030. Okay, that resolution speaks to a -- the city's desire and its target to reach a certain goal of renewables for its city operations by a date certain. It does not speak to whether those resources are currently, or if they ever will be necessarily reasonably available. It does not hit an issue in the case, in other words. It's not relevant to the issues in the case.

Exhibit B. It's a draft resolution from the California Public Utilities Commission. So it's not a official final action of the Commission as presented with the document from Sierra Club. And

so therefore, it would not account for an official action.

Further, in terms of the subject matter, it addresses California in a very specific regulatory construct in California where they do have a renewable portfolio standard. They do have an independent system operator. They do have a number of factors to suggest the type of RFP that's discussed in that document is unique to California, and really has no bearing on the issues in this case.

In terms of Exhibits C and D. Those are two reports, assessment reports from the North American Electric Reliability Commission. These are recommendations from NERC to various stakeholders, and they would not constitute an official action in terms of a rule regulation or requirement from NERC. That recommends developing future guidelines in Exhibit Z -- Exhibit C, I am sorry -- but no official action or commitment to such action.

More so, the report does not address Florida. It addresses independent system operators across the country. These are independent system operators that have different energy market structures than Florida. So, again, not relevant.

Exhibits D, another NERC assessment report does mention Florida, but, in fact, when you look at page 18, footnote 16, it indicates that it's not necessarily current on Florida. It doesn't even account for the fact that Sabal Trail and the Florida Southeast Connection may not even be included in that analysis.

Again, this is another assessment report. It's not an official action of NERC in terms of a regulation or a requirement from NERC, and therefore, really wouldn't qualify for official recognition.

And then the last set of documents from the National Renewable Energy Laboratory, which I recognize is part of the U.S. Department of Energy. Again, these reports, all three of them, expressly put out a notice that say that the U.S. government is not representing the -- representing these to be accurate, or standing behind these documents in any way, shape or form.

These are, again, analyses of costs looking at solar, but they are not an official action of the government. And that is what official recognition is for.

So, again, at the end of the day, while there

might be some relevancy, these are not documents that the Commission should make a practice of taking official recognition of.

Certainly, if Sierra Club were to use these documents in cross-examination and, with our witnesses, that, you know, laying the basic foundation, that may be proper. But, again, it's not something where the Commission should take official recognition and just say these documents should come into the record and be officially recognized.

Thank you.

CHAIRMAN GRAHAM: Thank you.

All right, Commissioners, let me give you my thought process, if you want me to start.

We will go backwards with F and G. In my opinion, these are opinion papers that there is no official action taken by the National Energy Renewable Labs.

The C and D, also opinion papers.

B is a draft resolution that is not approved by a -- a municipal body, or a standing body.

And A, a resolution from the City of Sarasota. A resolution is basically -- and it's not an ordinance. It's a resolution, which is basically,

this is how the City of Sarasota feels about this, and this is a goal. This is our goal, and we've sat down, we talked about it and we voted on it.

So of these, A through G, A is the only one that I could see taking official notice, but I am willing to hear from the two of you.

Commissioner Brown.

COMMISSIONER BROWN: Chairman Graham, even as a nonlawyer, you did a good job. I agree with you 100 percent on all of those issues. A would be the only one that with raise any level to -- but I don't think it has bearing on this matter, so I agree. I think all of them should be denied official recognition.

I think it's still moot to try to enter them into the record as an exhibit when it comes out, but I don't think we should take that type of action today.

CHAIRMAN GRAHAM: Commissioner Clark.

COMMISSIONER CLARK: I too, agree, Mr. Chairman. I had marked A and E as potentials, primarily because item E was a benchmark, not necessarily a stated fact, so that was my observation.

CHAIRMAN GRAHAM: Well then, unless I hear

opposition, I think we will enter A into the record, because this is a resolution, unless somebody can show me some facts that this is not the case, that this is an official resolution from the City of Sarasota, we will allow that into the record.

And the other ones, there is no foundation. If they want to bring it up for cross-examination, they are more than welcome to do that, or I guess, in the future, if you want to provide a witness that wants to bring this up, we can enter it in that way, but we are at where we are right now, so that's what we are going to do moving forward.

Staff.

MR. MURPHY: Are we ready to move on to the exhibit list?

CHAIRMAN GRAHAM: Yes.

MR. MURPHY: Okay. Staff has compiled a Comprehensive Exhibit List, which includes the prefiled exhibits attached to the witness' testimony in this case and a number of staff exhibits. The list has been provided to the parties, the Commissioners and the court reporter. This list is marked as the first hearing exhibit, and the other exhibits should be marked as set

forth in the chart.

At this time, staff asks that the Comprehensive Exhibit List, marked as Exhibit 1, be entered into the record.

CHAIRMAN GRAHAM: Is there any objection to moving the Comprehensive Exhibit List into the record?

MR. COX: FPL has no objection, but we did have some scriveners corrections on one of -- or two of the exhibits. I am sorry.

CHAIRMAN GRAHAM: Is this something you have in a written form that we can enter, or is it brief believe enough we can go through them?

MR. COX: We just found it last night. I apologize. And they are very brief scriveners errors on a header on two of the exhibits.

CHAIRMAN GRAHAM: Sure.

MR. COX: Okay. These are identified on the staff exhibit list under Witness Richard Feldman, Exhibits 7 and 8, in both Exhibits 7 and 8. 7 is RF-2, and Exhibit 8 is RF-3. And in the header, it does not affect the substance of the document, but in the header, where it says 19 -- History, 1980 to 2016, it should read, History, 1990 to 2016. So the 1980 should be changed to 1990.

CHAIRMAN GRAHAM: Okay.

MR. COX: And the same correction needs to be made on Exhibit 7, which is RF-2, changing the 1980 do 1990 -- where it says, history, 1980 to 2015, should read, history 1990 to 2015, and that's it. Thank you.

MS. HELTON: So those are on the actual exhibits themselves, not the description on the comprehensive exist list?

MR. COX: Correct. I just wanted to make a note at this time that there were corrections on those. And we can do it when the witness comes up again if you would like, but I would just like to make that note.

CHAIRMAN GRAHAM: That's fine.

Any other comments or complaints about the Comprehensive Exhibit List?

MS. CHRISTENSEN: No objection.

MS. KAPLAN: No objection.

CHAIRMAN GRAHAM: Okay. We will enter the Comprehensive Exhibit List into the record with those two modifications.

MR. MURPHY: Thank you, sir.

(Whereupon, Exhibit No. 1 was received into evidence.)

MR. MURPHY: Would you like me to include a new Exhibit 60 in my description here in the motion since not been objected to by the parties?

CHAIRMAN GRAHAM: Yes. We will enter number 60 into the record as well.

MR. MURPHY: Okay. So if that's been moved in -- well, I will just do it as a motion.

Exhibits 2 through 60 have been stipulated by the parties. Staff asks that all 2 through 60 be included in the record.

CHAIRMAN GRAHAM: Is that correct with all parties?

MR. COX: No -- no objections.

MS. CHRISTENSEN: We had no objections through 2 through 60. I just I guess a question. Are we go to move them now or move them as the witnesses come on the stand?

CHAIRMAN GRAHAM: Let's just go ahead and move them now.

MS. CHRISTENSEN: Okay.

CHAIRMAN GRAHAM: I think there is no objections.

MS. KAPLAN: No objections.

CHAIRMAN GRAHAM: Okay. Then we will move Exhibits 2 through 60 into the record.

(Whereupon, Exhibit Nos. 2 - 60 were received into evidence.)

MR. MURPHY: Staff asks that any other exhibits proffered during the hearing be numbered sequentially following these listed in the Comprehensive Exhibit List.

CHAIRMAN GRAHAM: Okay. All right. We are going on to opening statements.

MR. COX: Good morning, Chairman Graham and Commissioners.

Florida Power & Light Company is requesting an affirmative determination of need for the Dania Beach Clean Energy Center Unit 7, which will be a highly fuel efficient state-of-the-art combined cycle unit located at FPL's current Lauderdale Plant site. This important modernization investment is projected to save customers hundreds of millions of dollars and ensure reliable service for our customers.

The Dania Beach unit will meet the projected needs for FPL and its customers beginning in 2022 for both the FPL system and the entire southeastern Florida region, which is FPL's primary load center consisting of Miami-Dade and Broward Counties.

This 1,163-megawatt unit will replace the

older less efficient 884 megawatt Lauderdale Units 4 and 5. The new unit will be one of the most efficient combined cycle unit on FPL's system, or anywhere in the country. The modernized facility is uniquely positioned to utilize existing infrastructure and resources.

FPL has a window of opportunity to retire the aging units and construct this modernization project while maintaining reliability due to the 2019 additions of the Corbit Sugar Quarry Transmission Line and the Okeechobee Clean Energy Center.

The Dania Beach modernization will achieve three significant and important benefits for our customers. Cost savings. Reliable service, both for our entire FPL system and the southeastern Florida region, and lower emissions and reduced consumption of natural gas for our entire system.

The project is projected to provide $337 million in cost savings compared with keeping the existing units operating, and 1.3 billion lower costs in the solar and energy storage alternative with equivalent reliability.

The Dania Beach unit will immediately enhance reliability in the southeastern Florida region in

2022, plus meet resource needs beginning in 2024 and growing significantly thereafter.

The unit's high fuel efficiency result in cost savings for FPL's customers from day one, due to less natural gas burned on the FPL system and lower emissions.

The NOx emission rate for this new unit will be 95 percent lower than the existing units, with significant reductions in carbon dioxide and total air emissions as well.

Put simply, the Dania Beach modernization is the best and most cost effective option for FPL's customers, and it satisfies the need determination criteria. It's needed after accounting for all reasonable achievable renewable energy and conservation measures available to FPL, which includes more than 2,000 megawatts of universal solar planned by 2023. It will result in the lowest system cost and electric rates for FPL's customers of any alternative proposed or considered.

Only Sierra Club has presented a witness in opposition to FPL's request. However, its consultant, Dr. Hausman, has not disputed the primary support for FPL's need determination

request, including hundreds of millions of dollars in cost savings for FPL's customers. Enhanced system and regional reliability, and lower system fuel usage and emissions. Now instead, Sierra Club presents incomplete, inaccurate testimony about an illustrative alternative to Dania Beach that bears no reduced semblance to the real world.

Dr. Hausman admits that his proposed alternative portfolio is not a complete resource plan, and he has not provided any meaningful cost analysis in support. Dr. Hausman's only attempt at economic analysis is a delayed scenario for the proposed unit, which only serves to put FPL's customers at an increased and unreasonable operational risk.

Commissioners, while Sierra Club can afford to be wrong about this project, FPL cannot. As a prudent utility operator, FPL believes it's unreasonable to expose the system and its customers to an operational risk from such an arbitrary delay.

This petition is not about a choice between natural gas generation versus solar generation, as Sierra Club would have you believe. Sierra Club is not focused on reliability for FPL's Miami-Dade and

Broward customers, but is using this case as part of its nationwide effort to oppose any and all natural gas infrastructure, both power plants and pipelines. Well, FPL, on the other hand, has a regulatory compact with this commission, and unwavering commitment to its customers focus on reliability every hour of every day.

A need determination for the Dania Beach project in 2022 will provide hundreds of millions of dollars in savings for our customers and significantly enhance regional and system reliability. And at the same time, FPL will continue to be a leader bringing cost-effective utility scaled solar to our customers.

A delay of this project will bring reliability risk to the largest, most concentrated residential and business population center in our service territory, and is not in the best interest of our customers. Respectfully, therefore, FPL requests that the Commission grant FPL an affirmative determination of need for the Dania Beach project.

Thank you for this opportunity to present FPL's opening statement.

CHAIRMAN GRAHAM: Thank you, sir.

Okay, OPC.

MS. CHRISTENSEN: Yes, I am prepared to go first on opening statements, but I would ask that Sierra Club be allowed to go first on cross-examination and us second. I think it will help speed up the process since I think they are going to do the bulk of the cross-examination.

CHAIRMAN GRAHAM: Sure.

MS. CHRISTENSEN: Okay. Good morning, Commissioners. Patty Christensen with the Office of Public Counsel.

As you heard from FPL, we are here to determine if FPL's request to retire its existing Lauderdale Units 4 and 5 in 2018 and replace them in 2022 with a new two-on-one advanced CC unit called the Dania Beach Clean Energy Center, or Dania Unit 7, at the existing Lauderdale Plant site should be approved.

OPC believes that at the conclusion of the hearing, based on the testimony and exhibits, FPL will not have met its burden to show a need for the Dania Unit 7 in 2022.

First, FPL's 2016 10-year site plan does not project a need to add a new -- to add new resources to its system until 2024 to meet system reliability.

Moreover, according to the 2017 projection of FPL resource needs, FPL's 2024 summer total margin -- reserve margin will be 19.8 percent, which is only 54 megawatts below a full 20 percent margin reserve.

Furthermore, the addition of the Corbit Sugar Quarry, or the QS -- or the CSQ line, of 500 kV in mid-19 -- 2019, provides a transmission importability of approximately 1,200 megawatts, which addresses the southeast's regional needs through 2030.

Now, assuming the retirement of Units 4 and 5 in late 2018, and the installation of the CSQ line in mid-2019, FPL's analysis and projections do not show a regional imbalance until 2025. Thus, FPL's own supporting documentation demonstrates that there is need for a new unit before 2024.

Second, FPL's Dania Unit 7 proposal relies on the assumption that a four-year period between the retirement of the Lauderdale Units 4 and 5 and its replacement power is necessary, and that all 1,163 megawatts of the Dania Unit 7 must be replaced. However, FPL has not been able to support this assumption.

FPL alleges that the Dania Unit 7 proposal is

337 million cumulative present value of revenue requirements, or CPVRR, less expensive than keeping the existing units, and 1.288 billion CPV -- CPVRR less expensive than the equivalent amount of firm capacity in the Southeast Florida supplied by solar and batteries sited in the southeast.

The next savings benefits is based on the assumption that the four-year period between retirement and replacement must be maintained which FPL cannot support. The evidence will show that no regional imbalance, as I said before, will occur until 2025.

While, FPL supposedly considered scenarios of a one- or two-year delay in placing Dania Unit 7 into service, these scenarios included the unsupported four-year period between retirement and replacement to conclude that the delays were uneconomical.

Thus, FPL cannot demonstrate that retiring the Lauderdale Units 4 and 5 in late 2018, with a delay in placement -- replacement power until 2024 is not more economical than FPL's proposed Dania Unit 7 replacement in 2027. And this is even considering the newly created area reserve margin proposed by Witness Sanchez.

In conclusion, FPL has failed to meet its burden in this docket, or will fail to meet its burden in this docket because it cannot support its request to retire the existing Units 4 and 5 in 2018, and to replace them in 2022 with a new Dania Beach Clean Energy Center.

Thank you.

CHAIRMAN GRAHAM: Thank you, Ms. Christensen.

Sierra Club.

MS. KAPLAN: As this hearing will demonstrate, the Commission cannot approve FPL's request for a determination of need for the proposed new Dania plant. FPL simply has not, because it cannot, demonstrate that building an 1,100 plus megawatt gas plant now is needed, prudent or reasonable. To make such a demonstration, FPL would have to identify a clear need, and then provide an analysis of reasonable alternatives that shows that building the massive Dania plant now is the most cost-effective means of meeting that need. Precisely because FPL is cannot make this demonstration, it repeats its strategy of presenting a skewed set of alternatives that FPL preselected to lead to a build Dania now conclusion.

However, the basic facts in this case remain the same. FPL admits that its existing plant generation assets exceeds its 20 percent reserve margin for the next six years, at least until 2024, when FPL's own modeling shows that it has, at most, a 54-megawatt shortfall. And the public clearly does not need FPL to build an 1,100-megawatt plant today to meet a 54-megawatt shortfall six years away in 2024.

Indeed, FPL's own modeling, conducted at the request of Commission staff, confirms that conclusion reached by Sierra Club's expert that even just delaying Dania for a few years will save the public tens of millions of dollars. Moreover, FPL's skewed alternatives analysis refused to consider obvious common sense alternatives.

Nowhere, for example, did FPL evaluate building new generation in an incremental fashion, just that building a smaller number of megawatts of renewable energy to meet the 54-megawatt shortfall that FPL's modeling identifies in 2024. Instead, FPL's alternative analysis only considers building out today 1,100 megawatts of gas, or an equivalent amount of renewable energy, despite the fact that FPL only needs 54 megawatts of energy to beat its

20 percent reserve margin in 2024.

Nor did FPL meaningfully analyze how rapidly the industry has changed over the last seven years with plummeting wind, solar and storage prices, and how rapidly it will continue to change over the next seven years, locking FPL's ratepayers into a massive expensive gas plant today robs them of the benefits of clean energy, precisely when utilities across the country, and across the world, are reducing cost and risk by rapidly moving into a renewable energy future, one need look no further than the plaintiff remembers of gas plants like GE and Siemens, laying off tens of thousands of employees from their gas turbine divisions. To hear the market's drumbeat, that gas is no longer a good investment, and becomes a worse investment with each passage of each year.

In a last ditch effort to evade the basic economic facts underlining the case, FPL has introduced a claim that Dania is needed to meet an entirely new heretofore undocumented extra, extra reserve margin for Southeast Florida, beyond the reliability requirements that have been identified based on what FPL's expert has described as thousands and thousands of contingencies.

Tellingly, FPL cannot quantify what this new extra reserve margin is. FPL cannot identify if it is some additional percent of demand. FPL cannot explain how many megawatts it is. FPL cannot even explain when it came into being, or identify other utilities' super reserve margin and what size their extra reserve margin might be.

All FPL can say is that Dania meets it, whatever it is. And that it requires Dania to be built at least two years earlier than what FPL's well documented and Commission-approved reliability criteria would require, which just so happens to supposedly justify the Commission's approval of a Dania plant in this case. The Commission should not buy what FPL is selling.

As this hearing will demonstrate, the basic facts underlying this case demonstrate that Dania is not needed now. There are cheaper alternatives that promise to save the public money, including simply delaying the Dania plant, or building out new generation in an incremental fashion. The Commission must deny FPL's request in this case.

CHAIRMAN GRAHAM: Thank you.

Okay. We need to swear in the witnesses. If you are here to give testimony during this hearing,

if I can get you to stand and raise your right hand, please.

(Whereupon, all witnesses present were sworn.)

CHAIRMAN GRAHAM: Thank you.

All right. Our first witness is going to be Dr. Sim. I think it's a perfect time for me to show you my new Christmas present to deal with my efficiency. We are going to take a five-minute break -- we are going to take a five-minute break and start back up with Dr. Sim.

(Brief recess.)

CHAIRMAN GRAHAM: Florida Power & Light, your witness. Your mic is off.

MR. COX: There we go. Third time is a charm. Sorry about that.

All right. FPL calls its first witness, Dr. Steven R. Sim.

Whereupon,

STEVEN R. SIM

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

EXAMINATION

BY MR. COX:

Q Dr. Sim, have you been sworn in for the

hearing?

A I have.

Q Could you please state your name for the record?

A Steven Sim.

Q And who is your current employer, and what is your business address?

A Current employer is Florida Power & Light Company, 700 Universe Boulevard, Juno Beach, Florida.

Q And, Dr. Sim, did you cause to be filed on October 20th, 2017, 41 pages of direct testimony in this proceeding?

A Yes.

Q Did you cause to be filed on January 9th, 2018, an errata correcting your direct testimony?

A Yes.

Q Do you have any other changes or corrections to your testimony at this time?

A No.

Q If I were to ask you the same questions as contained in your testimony as corrected by the January 9th, 2018 errata, would your answers be the same?

A Yes, they would.

MR. COX: Chairman Graham, FPL requests that

Dr. Sim's direct testimony as corrected be inserted into the record as though read.

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

MR. COX: Thank you.

(Whereupon, corrected prefiled direct testimony was inserted.)

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for determination of need for Dania Beach Clean Energy Center Unit 7, by Florida Power & Light Company	DOCKET NO. 20170225-EI FILED: January 9, 2015

ERRATA SHEET OF STEVEN R. SIM

October 20, 2017 Direct Testimony

PAGE #	LINE #	CORRECTION
11	22	Change "that" to "than"
12	16	Change "598" to "596"
34	20	Change "Update" to "Updated"

October 20, 2017 Exhibits

EXHIBIT #	PAGE #	LINE #	CORRECTION
(No changes)			

December 22, 2017 Rebuttal Testimony

PAGE #	LINE #	CORRECTION
21	4	Change "of the both" to "of both"
23	2	Insert "target" after "…from-him"
44	14	Change "had zero" to "had nearly zero"
44	14	Change "This $0/kW" to "This nearly $0/kW"
48	15	Change "enhance increase" to "enhance"
56	9	Change "in" to "is"

December 22, 2017 Exhibits

EXHIBIT #	PAGE #	LINE #	CORRECTION
SRS-5	3 of 7	Row 12	Insert "nearly" before "zero"

I. INTRODUCTION AND CREDENTIALS

Q. Please state your name and business address.

A. My name is Steven R. Sim. My business address is 700 Universe Boulevard, Juno Beach, Florida 33408.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL) as Director of Integrated Resource Planning.

Q. Please describe your duties and responsibilities in that position.

A. I direct and perform analyses that are designed to determine the magnitude and timing of FPL's resource needs and then develop the integrated resource plan with which FPL will meet those resource needs. I also direct and perform analyses that are designed to otherwise improve system economics and/or enhance system reliability for FPL's customers.

Q. Please describe your educational background and business experience.

A. I graduated from the University of Miami (Florida) with a Bachelor's degree in Mathematics in 1973. I subsequently earned a Master's Degree in Mathematics from the University of Miami (Florida) in 1975 and a Doctorate in Environmental Science and Engineering from the University of California at Los Angeles (UCLA) in 1979. While completing my degree program at UCLA, I was also employed full-time as a Research Associate at the Florida Solar Energy Center (FSEC) during 1977-1979 where I analyzed potential renewable resources in the Southeastern United States.

In 1979, I joined FPL. From 1979 until 1991, I worked in various departments including Marketing, Energy Management Research, and Load Management, where my responsibilities concerned the development, monitoring, and cost-effectiveness analyses of demand side management (DSM) programs. In 1991, I joined the System Planning Department, later named the Resource Assessment & Planning department, where I held different supervisory and management positions dealing with integrated resource planning. I assumed my current position earlier this year.

Q. Have you previously testified on resource planning issues before the Florida Public Service Commission?

A. Yes. I have testified before the Florida Public Service Commission (FPSC) in numerous dockets. These dockets have dealt with various resource planning issues such as system reliability and economic analyses of resource options. The specific subjects of these dockets have included: (i) need determination filings for combined cycle (CC) units, advanced coal units, and nuclear units, (ii) nuclear feasibility analyses, and (iii) DSM goal-setting.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring four exhibits which are attached to my direct testimony:

Exhibit SRS-1	2017 Projection of Environmental Compliance Costs for CO_2;
Exhibit SRS-2	2017 Projection of FPL's Resource Needs Utilizing FPL's Two Reserve Margin Criteria;
Exhibit SRS-3	The Three Resource Plans Analyzed in 2017; and,

Exhibit SRS-4 The Economic Results for the Three Resource Plans Analyzed in 2017.

II. PURPOSE AND SCOPE

Q. What is the purpose and scope of your testimony?

A. The primary purpose of my testimony is to support FPL's request that the FPSC grant an affirmative determination of need for the construction of a new 2-on-1 (2x1) advanced CC unit sited at FPL's existing Lauderdale plant site in Broward County, Florida. The new CC unit, which will be named the Dania Beach Clean Energy Center (DBEC) Unit 7, will replace the older, less efficient existing Lauderdale Units 4 & 5 currently at the site. These older units will be retired prior to beginning construction of the new CC. This modernization of the Lauderdale site is projected to be completed by June 2022.

My testimony addresses six main points. First, I summarize what FPL is requesting from the FPSC and how the proposed DBEC Unit 7 meets the criteria the FPSC considers in a need determination filing. Second, I introduce the FPL witnesses who are providing direct testimony in this docket and, for convenience, briefly describe the information each FPL witness is providing in his/her direct testimony. Third, I provide an overview of analyses performed in the second half of 2016 in which FPL examined projected

resource needs for both the FPL system and the Southeastern Florida region (Miami-Dade and Broward counties), plus resource options that could potentially meet those projected needs.

Fourth, I discuss additional analyses conducted in 2017 using current forecasts and assumptions. The 2017 analyses resulted in a conclusion that the modernization of the Lauderdale site, with DBEC Unit 7 being placed in service in mid-2022, was the best option for FPL's customers. I summarize and discuss the benefits for FPL's customers of adding DBEC Unit 7. Fifth, I discuss the adverse consequences FPL and its customers would face if a determination of need for DBEC Unit 7 is not granted. Sixth, based on the analyses performed, I discuss my conclusion that the addition of DBEC Unit 7 will benefit FPL's customers from the perspectives of both economics and reliability.

Q. Please summarize your testimony.

A. In mid-2016, FPL began to perform an extensive set of analyses that examined FPL's projected resource needs for the entire FPL system and, importantly, the need to maintain a state of balance between generation and load in the Southeastern Florida region, which is needed to maintain system reliability in this very high load area. The 2016 analyses examined a variety of resource options and resource plans that could potentially address both the system need and the regional need. In the 2016 analyses, FPL examined: (i) new generation potentially located inside the Southeastern Florida region, (ii)

new generation potentially located outside of this region, and (iii) transmission options for increasing electricity import capability into the Southeastern Florida region from generation located outside of the region. The specific types of generation resources that were examined included: CC units, combustion turbine (CT) units, and solar photovoltaic (PV) options. In addition, FPL evaluated energy storage batteries, DSM, new natural gas pipelines (needed if generation was added at specific sites), and transmission facilities that would be needed to interconnect new generation options to the FPL system, and/or to integrate the transmission system as a whole.

Several conclusions were drawn from the results of the 2016 analyses. First, a new transmission line into Southeastern Florida was needed in virtually all resource plans analyzed and, once this transmission line was in place, it could address the regional needs through the decade of the 2020s. Second, the installation of this new transmission line can open a window of opportunity in which the old, low fuel efficiency existing Lauderdale Units 4 & 5 can be retired and their capacity replaced within the region. Third, continued operation of FPL's existing Lauderdale Units 4 & 5 is projected to incur significant costs in both the near and long term. Thus, a Lauderdale modernization option emerged as one of the most promising options in the 2016 analyses. That option, and several other promising resource plans and

resource options[1] from the 2016 analyses, were carried into 2017 for additional analyses that used updated forecasts and projections for load, fuel costs, environmental compliance costs, and resource option costs.

The result of the 2017 analyses was that retiring existing Lauderdale Units 4 & 5 in late 2018, followed by a modernization of the site by June 1, 2022 with a 2x1 CC unit (DBEC Unit 7), was projected to be the most economic option for FPL's customers. No new gas pipeline, transmission line, or water supply will be needed for the new CC unit. The resource plan based on this modernization is projected to be $337 million cumulative present value of revenue requirements (CPVRR) less expensive compared to keeping the existing Lauderdale Units 4 & 5 operating. In addition, this resource plan is projected to be $1,288 million CPVRR less expensive than a resource plan in which DBEC Unit 7 is not built and an equivalent amount of firm capacity (approximately 1,163 MW) in Southeastern Florida is assumed to be supplied by solar and storage batteries sited in that region.

With the addition of a new 2x1 CC unit of 1,163 MW (Summer peak capacity), FPL's customers would also benefit from increased reliability. This capacity addition, which would result in an increase in Southeastern Florida generating capacity of 279 MW (1,163 – 884 = 279) beyond the 884 MW

[1] The term "promising" refers to resource options and resource plans that emerged from the 2016 analyses as being among the lowest in terms of their cumulative present value of revenue requirements (CPVRR) costs.

currently supplied by existing Lauderdale Units 4 & 5, would enhance FPL's system reliability by increasing reserve margins. This additional capacity would also defer the need for future capacity additions. Also, because this new capacity is sited inside the Southeastern Florida region, the additional MW from DBEC Unit 7 will also assist in maintaining/enhancing regional balance. Furthermore, the new CC unit's high fuel efficiency will result in less natural gas burned on the FPL system than would be the case if the existing Lauderdale Units 4 & 5 remained in operation in a "status quo" scenario.

Thus, the proposed modernization of the existing Lauderdale plant site with a new 2x1 CC unit, DBEC Unit 7, is projected to result in economic, reliability, and fuel usage benefits to FPL's customers. Consequently, FPL is respectfully requesting that the FPSC grant a determination of need for DBEC Unit 7 with an in-service date of June 1, 2022.

III. FPL'S REQUEST FOR FPSC APPROVAL

Q. What regulatory approval is FPL seeking from the FPSC in this proceeding?

A. FPL seeks an affirmative determination of need for DBEC Unit 7 with an in-service date of June 1, 2022 from the FPSC.

Q. Is FPL's request for a need determination order based on economic savings for FPL's customers, on meeting future reliability needs, or both?

A. Both. The request is based on a combination of enhanced economics and enhanced system and regional reliability. Each of these factors will benefit FPL's customers. The remainder of my testimony will address these considerations.

Q. From a resource planning perspective, please address how the DBEC Unit 7 meets the need determination criteria set forth in Section 403.519, Florida Statutes.

A. Under Section 403.519(3), Florida Statutes, there are specific criteria that the FPSC is to consider in a determination of need proceeding. This relevant text reads as follows:

> *"In making its determination, the commission shall take into account the need for electric system reliability and integrity, the need for adequate electricity at a reasonable cost, the need for fuel diversity and supply reliability, whether the proposed plant is the most cost-effective alternative available, and whether renewable energy sources and technologies, as well as conservation measures, are utilized to the extent reasonably available. The commission shall also expressly consider the conservation measures taken by or reasonably available to the applicant or its members which might mitigate the need for the proposed plant and other matters within its jurisdiction which it deems relevant."*

I address the application of each of these criteria to the proposed Lauderdale modernization with DBEC Unit 7:

- *Need for Electric System Reliability and Integrity:* FPL's request for a need determination of DBEC Unit 7 is driven in large part by significant projected economic benefits for FPL's customers. In addition, the new unit will enhance FPL's system reliability and integrity as measured by FPL's two reserve margin criteria. The additional 279 MW that will result from retiring the 884 MW from existing Lauderdale Units 4 & 5, and adding 1,163 MW from DBEC Unit 7, will increase FPL's system reserve margin values and also defer the need for future capacity additions. DBEC Unit 7 will also assist in maintaining and enhancing the balance between generation and load in the Southeastern Florida region because this increased generation capacity amount will be sited in that region.

- *Need for Adequate Electricity at a Reasonable Cost*: In addition to the reliability benefits for both the system and region described above, DBEC Unit 7 is projected to result in the lowest system CPVRR cost of all of the numerous resource options and resource plans evaluated by FPL. As such, the unit is also projected to result in the lowest electric rates for FPL's customers when compared to these alternatives. This result is driven in part by DBEC Unit 7's projected installed cost, including AFUDC, of $764 per kW, which is projected to be significantly lower that the installed

cost/kW of FPL's most recent modernizations.[2] The fact that the new unit will not require any new gas pipeline, transmission line, or water supply contributes to lower the cost of this modernization.

- *Need for Fuel Diversity and Supply Reliability*: Because of DBEC Unit 7's high level of fuel efficiency, the unit is projected to lower the total amount of natural gas used by FPL's generating fleet compared to continuing to operate the existing Lauderdale Units 4 & 5 in a "status quo" scenario. With the start of operations earlier this year of the new Sabal Trail/Florida Southeast Connection pipeline system, the diversity and reliability of natural gas supply to FPL's system has been significantly enhanced. FPL is also pursuing cost-effective solar energy as a means to enhance fuel diversity on its system. For example, approximately 225 MW[3] of PV facilities went into operation at the end of 2016. Additionally, as part of its current Solar Base Rate Adjustment (SoBRA) filing, FPL is requesting approval for cost recovery of an additional 598 MW of cost-effective PV facilities that will be in service by early 2018. FPL's 2017 Ten Year Power Plant Site Plan (TYSP) further describes that FPL projects continued significant cost-effective PV additions through at least the year 2023. In the longer term, FPL is also seeking to enhance fuel diversity for its system by continuing to pursue a Combined Operating License for new

[2] The modernizations at Cape Canaveral, Riviera, and Port Everglades had total installed costs/kW of approximately $921, $1,053, and $928, respectively, using in-service year dollars.
[3] The MW values used for solar resource options represent the nameplate, AC rating of the option. The firm capacity values for these solar options will be lower than the nameplate ratings.

nuclear energy generation. If completed, this would allow the potential to construct and operate two new nuclear units at its Turkey Point site, subject to projected market factors and a full review by the FPSC prior to proceeding. The option to proceed to construct new nuclear generation would then be available to FPL and the FPSC for approximately 20 years.

- *Whether the Proposed Plant is the Most Cost-Effective Alternative Available*: As previously mentioned, FPL analyzed a variety of types of generation (including CCs, CTs, and PV), multiple potential generation sites, batteries, and DSM. The Lauderdale modernization project, which results in DBEC Unit 7, is projected to be approximately $337 million CPVRR less expensive than continuing to operate the existing Lauderdale Units 4 & 5 in a status quo scenario, and $1,288 million CPVRR less expensive than a resource plan in which DBEC Unit 7 is not built and an equivalent amount of firm capacity (approximately 1,163 MW) in Southeastern Florida is assumed to be supplied by solar and batteries sited in that region.

- *Whether Renewable Energy Sources and Technologies, as well as Conservation Measures, Are Utilized to the Extent Reasonably Available*: In addition to FPL's extensive and on-going implementation of cost-effective PV as described above, FPL's analyses of generation options in both its 2016 and 2017 analyses included PV facilities, including both

universal (utility-scale) PV and distributed generation (commercial rooftop) PV, sited in the Southeastern Florida region. Further discussion of this is presented later in my testimony. As for conservation measures, FPL's analyses accounted for all achievable, cost-effective DSM approved by the FPSC in the DSM Goals set for FPL through the year 2024, plus an assumed continuation of that same level of annual DSM implementation through the year 2030.

- *Conservation Measures Taken or Reasonably Available to the Applicant or its Members which Might Mitigate the Need for the Proposed Plant*: In the course of its analyses, FPL examined whether incremental cost-effective energy efficiency (EE) programs might be implemented in the Southeastern Florida region. FPL already implements approximately a third of its total EE program annual sign ups within this region. Thus, the opportunity to shift EE program implementation from other areas of its system into the Southeastern Florida region is limited, particularly if FPL is going to continue to offer its EE programs on a cost-effective basis to FPL's customers in the rest of its service territory at annual levels prescribed in FPL's DSM Goals.

Furthermore, additional EE above FPL's DSM Goals is not considered to be a viable option because the cost-effectiveness of DSM has continued to decline since FPL's DSM Goals were set in late 2014. This decline in

DSM cost-effectiveness is due to several factors that affect DSM's benefits (*i.e.*, costs that are potentially avoidable through DSM) including: lower forecasted fuel costs, enhanced generation efficiency of FPL's system (including cost-effective solar additions), lower costs for new generation options, lower projected environmental compliance costs, and a larger projected impact of energy efficiency codes and standards. This trend of declining DSM cost-effectiveness can be seen by comparing the cost-effectiveness analysis results from the 2014 DSM Goals docket with those from the 2009 DSM Goals docket, and by examining the results of FPL's response earlier this year to Staff's 1st Set of Interrogatories in Docket No. 2017002-EG, Interrogatory No. 1 that requested updated cost-effectiveness analyses of utility DSM programs. Such a comparison and examination will show that utility DSM program cost-effectiveness has been steadily declining for a number of years for the reasons described above. Therefore, levels of EE which are higher than those set in FPL's DSM Goals are not cost-effective and not a viable alternative to DBEC Unit 7.

IV. INTRODUCTION OF FPL WITNESSES

Q. Who are FPL's other witnesses in this docket and what subject(s) will each witness address in his/her direct testimony?

A. Three other FPL witnesses are providing testimony in this docket. A brief description of the witnesses, presented in alphabetical order, and the subject(s) each addresses in his/her direct testimony, follows:

- FPL witness Richard Feldman, of FPL's Load Forecasting group, presents FPL's load forecasting process, discusses the methodologies and assumptions used in the forecasting process, and presents FPL's 2017 TYSP load forecast that was used in the economic analyses that led to the selection of DBEC Unit 7.

- FPL witness Jacquelyn K. Kingston, of FPL's Project Development department, presents the engineering details of FPL's DBEC Unit 7, which involves the construction of a new state-of-the-art 2x1 CC unit at FPL's existing Lauderdale plant site in Broward County. Included in witness Kingston's testimony are the projected capital and operations and maintenance (O&M) costs, as well as the performance characteristics of the technology to be used in DBEC Unit 7 which were accounted for in FPL's economic analyses.

- FPL witness Heather C. Stubblefield, of FPL's Energy Marketing and Trading (EMT) department, describes the fuel transportation plan to deliver natural gas (the primary fuel for the new CC unit) and light oil (the secondary/back-up fuel) to DBEC Unit 7 and testifies to the ready availability of natural gas for this unit. Witness Stubblefield also presents FPL's 2017 TYSP fuel price forecast that was used in the economic analyses.

V. OVERVIEW OF FPL'S 2016 ANALYSES

Q. What was the objective of the analyses that FPL began in 2016?

A. As is described each year in FPL's annual TYSP filings, FPL conducts resource planning analyses designed to determine the timing and magnitude of FPL's next resource needs, and to determine the best resource option(s) with which to meet those needs. Included in this work are evaluations of a number of factors that are important in maintaining a reliable electric system and in keeping electric rates low for FPL's customers. One of these factors is maintaining a balance between generation and load in the Southeastern Florida region that consists of Miami-Dade and Broward counties. The importance of addressing this factor has been highlighted in each of FPL's TYSP filings since 2003.[4]

[4] Most recently, the importance of maintaining a balance between load and generation in Southeastern Florida is discussed on pages 61 and 62 of FPL's 2017 TYSP.

In 2016, FPL projected a need to add new resources to its system by 2024 to meet FPL's system reliability criteria. This was indicated in FPL's 2016 TYSP by the projected addition of an unsited CC unit in 2024 as a placeholder in the resource plan (because no decision regarding how to address this need was required at that time). A concurrent examination of the generation and load balance for Southeastern Florida also showed that an imbalance in the region was projected to occur at approximately the same time. Thus, the objective of the 2016 analyses was to determine the best approach to address both system and regional needs.

Q. Why is the Southeastern Florida region of particular importance?

A. There are several reasons for this. First, as also mentioned in FPL Witness Feldman's testimony, the electrical load in this two county region is very large, constituting 44% of FPL's total load. To put the magnitude of this load in perspective, the electrical load in just these two counties is roughly equivalent to the entire electrical load of the Duke Energy Florida system. Furthermore, this electrical load continues to grow. Second, these two counties are already highly developed and development continues to expand. As a consequence, areas suitable for electric generation facilities are limited. Third, these two counties sit near the end of the Florida peninsula and are surrounded by the Atlantic Ocean to the east, the Florida Keys to the south, the Everglades to the west, and highly developed areas in Palm Beach County to the north. Thus, the two counties are further constrained in regard to the

potential to build new transmission lines to transport power from outside the region into the two counties.

In summary, maintaining and enhancing balance between generation and load in Southeastern Florida is a significant factor in FPL's planning effort due to the sheer size of the region's electrical load, its continuing growth, and the constraints inherent in and around the region.

Q. Please explain what are meant by "balance" and "imbalance" and why it is important to avoid an imbalance in this region?

A. Electric load (MW) in Southeastern Florida is greater than the amount of generation (MW) sited in that region. Thus, when considering just load and generation sited in the region, there is an imbalance. As a result, a significant amount of energy required in this region, particularly during peak periods, is provided by importing energy through the transmission system from generating units located outside of the region. By accounting for this transmission "import" capability, a balance of load, generation, and transmission import capability for the region can be reached. However, as previously mentioned, electric load in the two county region is steadily growing.

Evaluations of regional balance are performed using load flow analyses that address both FPL's transmission and generation systems. These load flow analyses address not only the usual MW and MWh characteristics of an

electrical system that are utilized in resource planning analyses, but also address transmission system considerations to meet North American Electric Reliability Corporation (NERC) reliability standards.

As FPL approaches/reaches an imbalance condition in Southeastern Florida, at least two negative consequences begin to occur. The first of these, and by far the most important, is that the reliability of the transmission system in Southeastern Florida is placed at risk. Second, generating units in the region are operated out of system economic dispatch in an attempt to maintain regional balance. This increases system energy costs to all of FPL's customers, not just to customers within the region.

When an imbalance condition is projected, resources (generation, transmission, and/or DSM) need to be added either inside the region or, in the case of transmission, both inside and outside the region, to at least maintain, and hopefully enhance, regional balance.

Q. Please describe the approach used in FPL's 2016 analyses.

A. To address both the system need and the regional need, FPL performed an iterative series of analyses using its resource planning and transmission planning models. These models include: a reserve margin calculation spreadsheet, the Siemens PTI Power Transmission System Planning software load flow analysis model, the UPLAN production costing model, and FPL's fixed cost spreadsheet model.

For these analyses that began in mid-2016, FPL used the same forecasts for load, fuel cost, and environmental compliance cost that it had used in developing the 2016 TYSP. A few updates regarding generation assumptions were made. The most significant of these was in regard to the amount of PV that FPL would add throughout its system in future years. In its 2016 TYSP, FPL projected approximately 300 MW of additional PV after the year 2016. For these 2016 analyses, FPL assumed that it would add approximately 1,400 MW of PV beyond those 300 MW of PV presented in FPL's 2016 TYSP, or a total of approximately 1,700 MW of PV after 2016. All 1,700 MW of the additional PV was assumed to be sited outside of the Southeastern Florida region due to concerns about land availability and cost in the region. This additional 1,400 MW of PV, and the assumed locations of the PV, had the effect of moving both the projected system and regional needs back a year from 2024 to 2025.

Four separate analysis iterations were conducted sequentially during the second half of 2016. Various generation and/or transmission options formed the core of a specific resource plan, and each of the resulting resource plans was analyzed. Each of the four iterations also examined the transmission interconnection and integration facilities needed for the new generation and associated sites, as well as transmission facilities needed to import sufficient capacity to maintain balance in the Southeastern Florida region. In addition,

the need for, and cost of, new gas pipelines that might be needed for new gas-fired generation were evaluated.

The types of generation options, and the general siting of those options that were contained in the various resource plans analyzed in 2016, are summarized as follows:

- Iteration #1: CCs and CTs sited outside of the Southeastern Florida region;
- Iteration #2: CCs and CTs sited inside the Southeastern Florida region (including potential modernization of the existing Lauderdale plant site);
- Iteration #3: PV and/or batteries sited inside the Southeastern Florida region; and,
- Iteration #4: Another examination of a potential modernization at the existing Lauderdale site, as well as a potential modernization at the existing Martin site.

Q. FPL evaluated a wide range of resource options including CCs, CTs, PV, and batteries. Please discuss the experience that FPL draws upon when considering these resource options.

A. In regard to experience with CC units, FPL has placed 9 new CCs in service since the beginning of 2005, including the recent modernizations at the Cape Canaveral, Riviera, and Port Everglades sites (projects that are very similar to the proposed modernization of the existing Lauderdale site with DBEC Unit 7). In regard to CT experience, FPL has just completed the replacement of old

gas turbine peaking units with 7 modern CT peaking units sited at its Fort Myers and Lauderdale plant sites.

In regard to solar experience, in addition to the two PV facilities that FPL installed in 2009/2010, FPL installed three 74.5 MW PV facilities near the end of 2016. Additionally, FPL is currently petitioning the FPSC for approval to recover costs associated with 596 MW of new PV through the SoBRA docket (FPSC Docket No. 20170001-EI). These new PV facilities are under construction at the time this testimony is being prepared and will result in FPL having approximately 860 MW of PV by early 2018. Furthermore, FPL's 2017 TYSP discusses plans to have a total of approximately 2,345 MW by the end of 2023. In regard to storage, FPL is currently evaluating battery performance with its work in its smaller scale storage testing (several MW) and under its larger 50 MW Storage Pilot Program.

In summary, FPL has experience with the generation options examined in these analyses. The 2016 analyses, and the later analyses conducted in 2017, drew upon that experience in developing the performance and cost projections for each of the resource options.

Q. Are the cost projections for the solar and storage options market-based and how are the cost projections developed?

A. The cost projections for the solar and storage options used in FPL's analyses are market-based and are proprietary, internal projections of such costs. Cost

and performance projections for generating resources such as these are developed by an internal group shared by both FPL and NextEra Energy Resources (NEER). This group is tasked with developing and maintaining cost projections for a wide variety of generation options based on current and projected market conditions. These cost and performance projections are based in part on experience with prior projects that have been built. The projections are also based on information gained through on-going interaction with suppliers, contractors, and other utilities which helps provide a real-time view of the supply and demand markets and the direction(s) the markets are headed. The projections used in FPL's analyses account for costs of the equipment and construction itself as well for site-specific costs pertaining to local land and permitting.

Q. Please briefly discuss FPL's experience with DSM options.

A. In regard to DSM, FPL has continually offered utility DSM programs since 1979 that have been cost-effective and which have minimized adverse electric rate impacts to all FPL customers. The cumulative total of demand (kW) reduction – the aspect of DSM that actually avoids or defers the need for new power plants – from these programs is equivalent to avoiding the need for 15 new power plants of 400 MW each. Thus, FPL has extensive experience with DSM programs. In addition, FPL performs periodic economic analyses of its existing programs as well as of new DSM measure and/or program concepts.

As previously mentioned, the continuing trend of declining cost-effectiveness of DSM options resulted in FPL concluding that additional cost-effective DSM was not a viable option for addressing FPL's system and regional needs in the analyses. Consequently, the 2016 and 2017 analyses discussed in my testimony focused on CC, CT, solar, and storage options.

Q. What resource options and resource plans appeared economically competitive in the 2016 analyses?

A. The top three resource plans, and their featured resource options, from the 2016 analyses were as follows:

- A new 3x1 CC at either FPL's Okeechobee or Martin site;
- A modernization at the Lauderdale site which consists of retirement of the existing Lauderdale Units 4 & 5, followed by the addition of a new 2x1 CC unit at the same site; and,
- 983 MW of PV, including both universal PV and distributed generation (commercial rooftop) PV, sited in the Southeastern Florida region.

These three resource plans are listed above in the order of their economic ranking in the 2016 analyses. The plan featuring the 3x1 CC at either Okeechobee or Martin was projected at that time to be approximately $146 million CPVRR less expensive than the Lauderdale modernization, and $249 million CPVRR less expensive than the plan featuring almost 1,000 MW of PV located in Southeastern Florida. All other resource plans were projected to be at least $384 million CPVRR more expensive than the best plan.

Q. What conclusions did you draw from the 2016 analyses?

A. Three main conclusions were drawn from the results of the 2016 analyses. First, a specific new transmission line into Southeastern Florida was needed in virtually all resource plans analyzed including the top three plans. This new transmission line is the Corbett-Sugar-Quarry (CSQ) line which is a 500 kV line that runs from near FPL's West County CC units in Palm Beach County into the middle of Miami-Dade County.[5]

The CSQ line is projected to be able to address the regional need once it goes in-service. However, the projected in-service year for the line varied significantly among the three top resource plans based on the timing of the generation options included in the plan. The projected CSQ in-service dates in the top plans ranged from 2018 to 2027. Because this transmission line is an integral component of these plans, additional study regarding the best in-service date for the CSQ line was an early part of the continuing analyses in 2017.

Second, the installation of this new transmission line could open an early window of opportunity in which to consider retiring and replacing the capacity at FPL's existing Lauderdale site. The years in which that window is open depends upon when the CSQ line is placed in-service.

[5] The CSQ transmission line is part of the Levee-Midway project that is presented in FPL's 2017 TYSP in Table III.E.1 on page 68.

Third, FPL's continued operation of the existing Lauderdale Units 4 & 5 is projected to incur significant costs both in the near-term and in later years. However, the 2016 analyses used what I will refer to as an initial projection of operational costs (*i.e.*, fixed O&M and capital replacement costs) that would be needed to keep the existing Lauderdale Units 4 & 5 operating into the future. In addition, the net book value (NBV) cost impact of retiring the existing Lauderdale Units 4 & 5 had not yet been accounted for in the 2016 analyses. Therefore, additional study to be carried out in 2017 of a potential Lauderdale modernization would seek to use a more detailed look at what the projected on-going operational costs for Lauderdale Units 4 & 5 were and to incorporate the NBV cost impact of retiring those units.

With this view of the results of the 2016 analyses, FPL began new analyses in 2017 of the most promising resource options and resource plans.

VI. FPL'S 2017 ANALYSES

Q. What forecasts and assumptions were utilized in the 2017 analyses?

A. FPL used the same updated forecasts for load, fuel costs, and environmental compliance costs that were used in analyses that led to FPL's TYSP and SoBRA filings in 2017. As previously mentioned, Mr. Feldman's testimony presents FPL's 2017 TYSP load forecast and Ms. Stubblefield's testimony

presents FPL's 2017 TYSP fuel cost forecast. Exhibit SRS-1 presents FPL's 2017 projection of environmental compliance costs for CO_2.

In regard to the amount of PV that was assumed in FPL's resource plans, these analyses used the same PV implementation schedule that is presented in FPL's 2017 TYSP. That implementation schedule calls for approximately 2,100 MW of universal PV to be added after 2016 which represents an increased amount of PV compared to the PV assumption used in the 2016 analyses.

Q. Based on the 2017 TYSP load forecast and PV assumptions, what are FPL's projected system resource needs?

A. Exhibit SRS-2 presents projections of FPL's system resource needs based on FPL's two reserve margin criteria. Because one of the most promising resource plans that emerged from the 2016 analyses was a Lauderdale modernization that included the retirement of the existing Lauderdale Units 4 & 5, this exhibit presents a projection of system resource needs both with and without this retirement. The top half of this exhibit provides a projection of FPL's system resource needs assuming the retirement of the Lauderdale units in late 2018 (as shown in Column (3)). The bottom half of this exhibit provides a second projection of FPL's system resource needs assuming the Lauderdale units are not retired (as shown in Column (3)). With either of these projections, the first year of resource need is identical using either of FPL's

two reserve margin criteria and the projected magnitudes of the annual system resource needs are very similar.

Q. What was decided regarding the in-service date of CSQ transmission line and what are the impacts of that decision?

A. The decision was made to install the CSQ line by mid-2019 based on considerations of system resiliency and security. There are two impacts from that decision that relate to these analyses. First, the addition of the CSQ line increases the transmission import capability into Southeastern Florida by approximately 1,200 MW which can address the regional need from mid-2019 through the year 2030 (assuming no other changes in projected load, generation, and/or transmission capability). Second, the addition of the CSQ line in mid-2019 allows the retirement of the 884 MW from Lauderdale Units 4 & 5 to occur in late 2018, thus maximizing the cost savings of no longer operating those units. In turn, the retirement of this 884 MW of capacity alters the projection of the regional need. Assuming the retirement of the existing Lauderdale units in late 2018, the Southeastern Florida region is projected to become imbalanced as early as 2025.

Thus, the window of opportunity in which to replace the regional capacity lost by retiring the Lauderdale units is projected to close as early as 2025. This window could close even earlier if either the Summer peak load is higher than is currently projected and/or there are other changes in FPL's generating units that result in less available generation. As a consequence, FPL's 2017 analysis

looked at resource options and resource plans that could provide additional capacity at a date earlier than 2025.

Q. You mentioned earlier that the 2016 analyses had used a preliminary projection of the cost to continue to operate Lauderdale Units 4 & 5. Was a more detailed projection of those operational costs developed for the 2017 analyses? If so, please discuss those costs.

A. Yes, a more detailed projection was developed for the 2017 analyses. As mentioned previously, there are two basic types of operational costs. The first type of cost is fixed O&M which consists primarily of plant staff payroll, overhead, and routine maintenance which are projected to escalate annually at a rate of 2.5% per year. The second type of cost is capital replacement which refers to capital costs for the CTs, heat recovery steam generators (HRSGs), and/or steam turbine that must be incurred periodically according to the manufacturer's instructions based on the generator's service hours. Using projections of these existing units' capacity factors and service hours, projections of on-going capital replacement costs were developed.

Replacement of the HRSGs is projected in the 2019 and 2020 time frame to coincide with steam turbine and CT outages and expenditures that are also projected for that time period. Additional major capital expenditures will be incurred in later years to ensure continued reliable and safe operation. The projected CPVRR cost of continuing to operate existing Lauderdale Units 4 & 5 for the duration of the analysis period is approximately $861 million. Based

on these more detailed cost projections, the retirement of the existing Lauderdale units looked to be even more promising than was the case in the 2016 analyses.

Q. What resource options and resource plans did FPL evaluate in the 2017 analyses?

A. The 2017 analyses focused on the most promising resource plans and resource options from the 2016 analyses which resulted in three resource plans being analyzed. Two of the resource plans assumed that the existing Lauderdale Units 4 & 5 retire in late 2018. The other resource plan assumed a "status quo" scenario in which these existing units are not retired and continue to operate. The three resource plans are presented in Exhibit SRS-3 and are summarized as follows:

- Plan 1: This is a status quo scenario that assumes no retirement of the existing Lauderdale Units 4 & 5. After a small one-year PPA in 2026, FPL's first generation addition is a 3x1 CC unit in 2027 sited at the Okeechobee site;
- Plan 2: Assumes retirement of the existing Lauderdale Units 4 & 5 in late 2018. A 2x1 CC unit (DBEC Unit 7) with a Summer capacity rating of 1,163 MW is added at the Lauderdale site in mid-2022. This results in an additional 279 MW of firm capacity being added in the Southeastern Florida region; and,
- Plan 3: Assumes retirement of the existing Lauderdale Units 4 & 5 in late 2018 (as in Plan 2). A sufficient amount of PV and batteries is assumed to

be added in the Southeastern Florida region by 2022 to approximate the incremental 1,163 MW of firm capacity that is added in the region in Plan 2 by the new 2x1 CC unit.

With the analyses of these three resource plans, FPL sought to examine the economics of new CC, PV, and battery options, and to look at the economics of the retirement of the existing Lauderdale Units 4 & 5 using the updated forecasts and assumptions.

Q: Please provide more detail regarding the solar and storage resource options that are assumed in Plan 3 including the firm capacity values used for solar and storage.

A. Plan 3 assumes that 1,033 MW of solar, plus 755 MW of storage, are in place by 2022. These resources are all assumed to be sited in Southeastern Florida in order for the resources to at least theoretically address both system and Southeastern Florida regional needs in the same way, and at a comparable level, that DBEC Unit 7 would do. The combined firm capacity from these solar and storage options is assumed to be approximately the same as the Summer MW rating of DBEC Unit 7: 1,163 MW. The solar and storage installations are assumed to be made over a several year period as shown in Exhibit SRS-3.

The 1,033 MW of solar is comprised of two types of solar installations. The first of these is universal solar and these installations are assumed to be

similar to FPL's SoBRA solar installations. However, the potential land in Southeastern Florida that is suitable for universal solar sites is both limited and generally more expensive than land costs outside of the Southeastern Florida region. The assumption used in the analyses is that a total of six such sites might be possible in the region, with five sites accommodating 74.5 MW each and one site accommodating 60 MW. Thus the amount of universal solar assumed in the analysis was approximately 433 MW. The second type of solar assumed in the analyses was distributed generation solar. These installations are assumed to be FPL-owned solar facilities that are sited on rooftops of commercial customers (such as on parking garages). The commercial customers would receive a lease payment from FPL in exchange for a 30-or-more year lease for the rooftop space. For purposes of this analysis, it was assumed that there could be a total of 600 MW of such facilities.

In regard to the storage options, it was assumed that batteries would be sited at/near FPL substations or power plants in the Southeastern Florida region to minimize costs. Each of these batteries was assumed to be able to contribute their full rated output continuously for 4 hours.

In regard to the firm capacity values assumed for these options, there were two firm capacity values for solar and one firm capacity value for storage. The first 265 MW of solar was assumed to provide a firm capacity value of 54% of the nameplate AC rating (as is the case with FPL's current SoBRA filing).

However, this amount of additional solar, when combined with projections of solar to be installed outside of Southeastern Florida in each of the resource plans, is projected to result in a shift in the timing of the remaining peak load on FPL's system that is not being served by solar. The projected shift in this "remaining" peak load is from the 4 to 5 p.m. hour to the 5 to 6 p.m. hour.[6] At this later hour of the day, the sun is lower in the sky and the MW output of solar is reduced. As a result, the projected output from any additional solar facilities beyond the first 265 MW decreases from 54% of the nameplate rating to 35% of the nameplate rating. Thus, the remaining 168 MW (433 MW – 265 MW = 168 MW) of universal solar, plus the 600 MW of rooftop solar, was assumed to provide 35% of their nameplate rating as firm capacity.

In regard to storage options, FPL currently assumes that batteries must be able to provide output continuously for at least 4 hours in order for this level of output to be viewed as firm capacity. Because FPL assumed that all of the storage options were continuous 4-hour batteries, the batteries were assumed to provide 100% of their nameplate rating as firm capacity, *i.e.*, 755 MW.

Q. Did FPL update its cost projections for solar and storage for the 2017 analyses?

A. Yes. Update capital and operating cost projections for both solar and storage

[6] Note that this shift in the peak hour for the remaining load to be served is similar to the shift in load and generation patterns seen in the "duck curve" that has been discussed in regard to large scale deployment of solar elsewhere, particularly in California

were developed prior to FPL's filing in this docket which allowed FPL's analysis to use the most current projections of solar and storage costs.

Solar and storage resources are not currently projected to have as long an operating life as a new CC unit. However, for these analyses, an optimistic-for-Plan 3 assumption was made. It was assumed that the operating life of both solar and storage would match the 40-year operating life of DBEC Unit 7. As a result, the additional solar and storage resources in Plan 3 would not have to be replaced with new solar and storage facilities at any point in time over the analysis period, thus avoiding the large capital costs of new replacement resources. In regard to on-going annual operating costs for these resources (fixed O&M, battery replenishment, etc.), it was assumed that these costs would continue through the duration of the analyses.

Q. What were the results of the economic analyses?

A. The results of these analyses are presented in Exhibit SRS-4. Page 1 of this exhibit shows the magnitude of the cost differences between the plans by presenting the projected CPVRR costs for the three plans. Page 2 of this exhibit shows the timing of the cost impacts on FPL's customers by presenting the cumulative CPVRR cost differences by year for Plans 1 and 3 compared to Plan 2. The results of the analyses are summarized as follows:

- Plan 2, featuring the planned retirement of the existing Lauderdale Units 4 & 5 in 2018, and the addition of DBEC Unit 7 in mid-2022, is

the most economic plan. It is projected to be approximately $337 million CPVRR less expensive than Plan 1 (the status quo scenario that assumes no retirement of the existing Lauderdale Units 4 & 5). Plan 2 is also projected to be approximately $1,288 million CPVRR less expensive than Plan 3 (which also assumes the retirement of the existing Lauderdale Units 4 & 5 in late 2018 and the addition of 1,033 MW of PV and 755 MW of batteries in Southeastern Florida by mid-2022).

- Plan 2 is projected to result in cost savings for FPL's customers beginning almost immediately versus either Plan 1 or Plan 3 as shown on page 2 of this exhibit.

Based on the results of these analyses, FPL concluded that the most economic choice for its customers is to proceed with the scheduled retirement of the existing Lauderdale Units 4 & 5 in late 2018, then add the 2x1 CC unit, DBEC Unit 7, at the existing Lauderdale site in mid-2022.

Q. Did FPL consider a scenario in which the in-service date for DBEC Unit 7 is delayed?

A. Yes. FPL considered scenarios of both a one-year delay and a two-year delay. In these scenarios, it was assumed that the in-service date of DBEC Unit 7 was delayed from mid-2022 to mid-2023 for the one-year delay scenario, and delayed to mid-2024 for the two-year delay scenario. In both scenarios, the retirement of Lauderdale Units 4 & 5 was also assumed to be delayed by

either one year or two years, respectively, to maintain the same roughly 4-year period in which a major Southeastern Florida generation component would be missing as is assumed in Plan 2. Projections for operational costs for Lauderdale Units 4 & 5, and construction costs for DBEC Unit 7, commensurate with the one-year and two-year delay scenarios were developed and used in the analyses of the delay scenarios.

The results of the economic analysis of the delay scenarios were that the delays were projected to increase CPVRR costs to FPL's customers by approximately $12 million for a one-year delay, and by approximately $38 million for a two-year delay. Thus, a delay of the mid-2022 in-service date of DBEC Unit 7 is projected to be uneconomic for FPL's customers.

Q. Assuming a need determination is granted for DBEC Unit 7, will FPL continue to evaluate the new CC unit?

A. Yes. As explained in the testimony of FPL witness Kingston, FPL will competitively procure models for the CTs, the heat recovery steam generator (HRSG), the steam turbine (collectively, the "Power Train Components"), and other related equipment that will comprise DBEC Unit 7, and optimize the design as a part of FPL's continuing efforts to determine which technology will provide the greatest benefits to FPL's customers.

Q. If FPL were to select an enhanced design or model for the DBEC Unit 7 Power Train Components or other related equipment, how does FPL propose to address such selection as it pertains to the determination of need requested by FPL in this proceeding?

A. FPL requests that, as a part of the FPSC's order granting an affirmative determination of need for DBEC Unit 7, the FPSC provide that its determination is not predicated on FPL's selection of a particular design or model for the Power Train Components or other related equipment necessary for operation of the unit, thus providing FPL with the flexibility through its negotiations and analyses to select the Power Train Components and other related equipment that best meet FPL customers' needs in terms of reliability and cost-effectiveness. Of course, FPL would select an enhanced design or model only if the enhanced design or model results in lower projected system CPVRR cost to FPL's customers. In the event that FPL selects an enhanced design or model other than the analyzed technology subsequent to the FPSC having granted a determination of need for DBEC Unit 7, FPL proposes to make an informational filing to the FPSC that documents the projected comparative CPVRR cost advantage of the alternate technology chosen. Such an approach was approved by the FPSC in FPL's most recent need determination docket involving the 2019 Okeechobee CC unit (FPSC Docket No. 150196-EI; Order PSC-16-0032-FOF-EI).

Q. Please summarize the benefits to FPL's customers of adding DBEC Unit 7.

A. DBEC Unit 7 is projected to benefit FPL's customers in a number of ways. First, it is projected to result in at least a $337 million CPVRR cost savings, and FPL's customers are projected to see cost savings almost immediately. Second, the unit's 1,163 MW of capacity will enhance system reliability and defer FPL's next resource need. Third, DBEC Unit 7 will result in an increase of 279 MW of highly reliable generating capacity in FPL's most heavily populated region, Southeastern Florida, which will help to maintain and enhance a balance between load and generation in the region. This also will enhance system reliability and economics. Fourth, DBEC Unit 7 will be highly efficient and is projected to reduce system natural gas usage compared to a status quo scenario in which the existing Lauderdale Units 4 & 5 continue to operate.

VIII. ADVERSE CONSEQUENCES OF NOT BUILDING DBEC UNIT 7

Q. Would there be any adverse consequences to FPL and its customers if the FPSC were not to grant an affirmative determination of need for DBEC Unit 7 in this proceeding?

A. Yes. If a determination of need for DBEC Unit 7 were not granted in this proceeding, FPL's customers will face adverse consequences in at least four ways. First, the results of FPL's economic analyses presented in Exhibit SRS-

4 show that FPL's customers are projected to receive at least $337 million CPVRR in lower costs over the life of the new 2x1 CC unit in comparison to all other alternatives analyzed. Therefore, denying the need determination for the new 2x1 CC unit would result in an adverse economic outcome for FPL's customers. Second, the 1,163 MW of capacity that is projected from DBEC Unit 7 will enhance system reliability and defer the need to add resources in future years. Denying the need determination will result in lower system reliability for FPL's customers and will result in FPL having to acquire new resources earlier than would be the case if the need determination is approved.

Third, the additional 279 MW of capacity that would be added in the Southeastern Florida region will enhance the reliability of electric service in the region. Thus, denying a need determination for DBEC Unit 7 will forego this opportunity to enhance regional reliability.

Fourth, DBEC Unit 7 will be a very fuel efficient generating unit with a projected heat rate of approximately 6,119 BTU/kWh. Once DBEC Unit 7 is in-service, it is projected that FPL's total usage of natural gas will decrease on a system-wide basis compared to the status quo scenario in which the existing Lauderdale Units 4 & 5 continue to operate. If the need determination is denied, FPL is projected to burn more natural gas by continuing to operate the existing Lauderdale units than would be the case if the need determination for DBEC Unit 7 is approved.

In summary, a decision to not grant a need determination for DBEC Unit 7 is projected to result in higher costs, lower system reliability, lower regional reliability, and higher fossil fuel usage.

IX. CONCLUSION

Q. What is your conclusion about the DBEC Unit 7 project?

A. As discussed previously, building DBEC Unit 7 with an in-service date of June 1, 2022 is beneficial for FPL's customers in various ways including economics, system reliability, regional reliability, and reducing fossil fuel usage. For these reasons, I believe the FPSC should grant an affirmative determination of need for DBEC Unit 7 with a target in-service date of June 1, 2022, based on a finding that this new 2x1 CC unit is projected to provide a variety of significant benefits to FPL's customers.

Q. Does this conclude your direct testimony?

A. Yes.

BY MR. COX:

Q Dr. Sim, did you also have Exhibits SRS-1 through SRS-4 attached to your direct testimony?

A Yes.

Q Did you have any connections to those exhibits?

A No.

MR. COX: And I recognize those were entered into the record earlier, but I just wanted to make sure there were no further corrections.

And again, those exhibits have been identified as Exhibits 2 through 5 on the staff comprehensive exhibit list.

BY MR. COX:

Q Dr. Sim, have you prepared a summary of your direct testimony?

A I have.

Q Can you please present your summary to the Commission at this time?

A Yes, I will.

Good morning, Chairman Graham and Commissioners.

FPL is speaking an affirmative determination of need decision for Dania Beach Energy Center Unit 7 in 2022 based on projections that the unit will provide

significant economic benefits for FPL's customers that begin this year, plus increase system in Southeast Florida regional reliability and reduce system use of natural gas, as well as reduced system emissions.

My testimony discusses the results of analyses that began in mid-2016 to simultaneously analyze the entire FPL system and the southeastern Florida region, consisting of Miami-Dade and Broward Counties, regarding reliability issues projected to occur in the first half of the 2020s.

During 2016, 33 different resource plans were developed to examine a wide variety of resource options, including CC and CT units sited both inside and outside of the Southeast Florida region, solar and storage located inside Southeast Florida, new transmission lines, demand side management and new pipe lines.

The most promising resource options from the 2016 analysis were then carried into 2017 at which date updated forecasts and assumptions were used to develop new resource plans to further analyze the options. The 2017 analyses focused on three resource plans.

Plan 1 is a status quo plan in which the Lauderdale Units 4 and 5 are not retired and the Dania Beach unit is not built.

In Plan 2, we assume that the Lauderdale units

are retired at the end of 2018, and then we modernized the Lauderdale site by adding the new two-on-one combined cycle, which is the Dania Beach unit, with an 1,163 megawatts summer firm capacity rating in June of 2022.

In Plan 3, we also retire the Lauderdale units in 2018, and then we add an equivalent amount of firm capacity by June 2022 from solar and storage sited in Southeast Florida.

The results of the analyses are:

Plan 2, which features Dania Beach in 2022, is projected to lower costs for FPL's customers by 337 million CPVRR dollars compared to the status quo plan, and these cost savings begin this year.

Plan 2 is also projected to lower CPVRR costs for FPL's customers by approximately 1.3 billion compared to Plan 3, which featured the solar and storage.

Plan 2 is also projected to reduce system use of natural gas, reduce system SO2, NOx and CO2 emissions, an enhance system and regional reliability compared to the status quo plan.

Therefore, because this modernization of the Lauderdale plant site is projected to provide numerous and significant benefits for our customers, FPL

respectfully requests the Commission to grant a determination of need for Dania Beach Unit 7 with an in-service date of June 2022.

Thank you.

CHAIRMAN GRAHAM: Thank you, Dr. Sim.

MR. COX: Thank you, Dr. Sim.

Chairman Graham, the witness is tendered for cross-examination.

CHAIRMAN GRAHAM: Thank you.

Before we get started, I just want to make sure that I reiterate how we cross-examine witnesses here.

Number one, there will be no friendly cross.

Number two, the witness will answer the question either yes or no and give a brief answer to it if they need to explain that yes or no. And if you need for them to restate it, or ask it a different way, or you can actually restate the question yourself if you misunderstood it or you want to clarify it, and then answer it yes or no.

If the witness goes on too long, starts to editorialize, feel free to tell them -- to cut them off. And if we need to add something afterwards, that's up to whichever attorney supported the witness to bring that up into the record later on,

or you can bring that up on cross -- I mean, on rebuttal -- not rebuttal, redirect, thank you.

And I think of that's it off the top of my head. If anything else comes up. I will let you know.

Sierra Club, your witness, please.

EXAMINATION

BY MS. KAPLAN:

Q Good morning, Dr. Sim. This is Julie Kaplan, as you know, for the Sierra Club.

A Good morning again.

Q So as we are talking, I will refer to the Dania Beach Energy Center as DBEC, is that okay?

A Yes.

Q So you have worked for FPL since 1979?

A Yes, the end of 1979.

Q And you are the Director of Resource Planning?

A Of Integrated Resource Planning, yes.

Q And you have held various managerial positions in FPL's Resource Planning Division for over two decades?

A Yes.

CHAIRMAN GRAHAM: Ms. Linda, if I can get you to pull that mic down just a little bit.

MS. KAPLAN: Sure.

CHAIRMAN GRAHAM: Thank you.

BY MS. KAPLAN:

Q You are not a lawyer?

A That's correct.

Q But you are familiar with the criteria FPL uses to develop its resource plans?

A Yes.

Q Are you familiar with the criteria that this commission uses to review FPL's resource plans?

A I believe I am.

Q Let's turn to the criteria for system reliability and adequacy.

The term peak load refers to the maximum load on an electrical power system, correct?

A Yes.

Q And the system reserve margin is a measure of system reliability, is that correct?

A It is one measure of system reliability, yes.

Q As applied to FPL's system, system reserve margin is a projection of the available resources at the time of FPL's annual peak load, correct?

A I am sorry, can you repeat the question, please?

Q As applied to FPL's system, system reserve margin is a projection of the available resources at the

time of FPL's annual peak load?

A Yes, generally I will accept that.

Q More specifically, system reserve margin is the percentage by which available resources at the time of FPL's annual peak load exceed the projected peak load?

A Not necessarily. It can exceed. It can fall under what the firm peak load is.

Q According to FPL's 2017 10-year site plan, FPL's 20 percent reserve margin criterion is designed to maintain reliable electric service for FPL's customers in light of forecasting and other uncertainty; does that sound right?

A It's, again, one of the reliability criteria that we use to gauge the reliability of the system.

Q FPL has also proposed a generation only reserve system reserve margin, correct?

A Not quite. We have -- we have not just proposed it. We have been using it now for the last three or four years.

Q According to FPL's 2017 10-year site plan, FPL's 10 percent generation only reserve margin criterion is also designed to maintain reliable electric service for FPL's customers in light of forecasting and other uncertainty, is that correct?

A Yes. Again, it is one of the reliability criteria that we use in our planning.

Q You helped develop FPL's need position for DBEC, correct?

A I am sorry, could you repeat?

Q You helped develop FPL's need petition for DBEC?

A Yes, but only in the loosest sense. I did not write the petition. I reviewed a draft, and may have answered questions that our attorneys had when developing it. So in that sense, I helped develop it.

Q The petition refers to FPL's two-system reliability criteria?

A I believe that's correct, yes.

Q The 20 percent reserve margin and the 10 percent generation only reserve margin, correct?

A I believe they both were mentioned in the petition, yes.

Q For purposes of this proceeding, you have testified that these are the relevant system reliability criteria, correct?

A They are from a resource planning perspective. There are other perspectives that the company takes when it develops resource plans.

Q Let's turn to your Exhibit SRS-2, where you

present projections of FPL's system resource needs based on FPL's two reserve margin criteria.

A I am at the exhibit.

Q These are FPL's own projections, right?

A Yes.

Q Let's refer to the top half of Exhibit SRS-2.

The top half is a table of projections under a scenario where Unit 4 and 5 at FPL's Lauderdale site retire in 2018, right?

A Yes.

Q And this scenario assumes FPL as the 2,100 megawatts of planned solar identified in FPL's 2017 10-year site plan?

A That is correct.

Q Okay. So to make sure we draw accurate inferences from your projections, according to the top half of SRS-2, 2024 is the first year when you project that FPL may not need -- meet its 20 percent reserve margin criterion, correct?

A Given the assumptions here, and the load forc -- especially the load forecast and the available generation, that is correct.

Q Therefore, in 2024, you project FPL's available resources will be 50 megawatts short of FPL's 20 percent system reserve margin, correct?

A They will be 54 megawatts short of our 20 percent total reserve margin criterion, and 91 megawatts of our 10 percent generation only reserve margin criterion.

Q And 2028 is the first year when you project a shortfall of available resources as great as the name plate capacity of DBEC?

A No, that's incorrect.

Q What is incorrect about that?

A I believe you said 2028 is the first time we show a need greater than the 1,163 megawatts. I believe that year would be 2027.

Q Now let's turn to the bottom half of Exhibit SRS-2. This is another table showing your projections of FPL's resource needs under FPL's two-year reserve margin criteria.

The bottom table reflects a scenario where both Lauderdale Units 4 and 5 continue to operate, correct?

A That's correct.

Q You did not present a scenario where just one Lauderdale unit is retired in 2018, correct?

A That is correct, for good reason.

Q You did not present a scenario where one Lauderdale unit is put into generation reserve in 2018,

correct?

A I am sorry, can you explain the term generation reserve?

Q Inactive reserve.

A That's correct. That was not the intent of this document. It was to project resource needs.

Q You have testified to FPL's projected resource needs in Southeast Florida, correct?

A I have discussed it in my testimony, yes.

Q By Southeast Florida, you mean Miami-Dade and Broward Counties?

A Yes.

Q The term regional needs in your testimony refers to potential imbalance issues in Southeast Florida, correct?

A That's correct.

Q When we spoke earlier at your deposition, you elaborated on those potential imbalance issues. You enumerated several factors that could give rise to those issues. One factor is projected peak load within Southeast Florida, correct?

A That is one factor that is used when one analyzes the Southeast Florida balance or imbalance situation.

Q Another factor is the amount of available

generation within Southeast Florida?

A That is another factor, yes.

Q The third factor is transmission import capability from outside Southeast Florida into the region?

A That is another factor.

Q You have overseen analyses of the potential imbalance issues in Southeast Florida, the analysis includes load flow analysis, is that correct?

A That's correct, but I did not oversee those analyses. Those are done by our Transmission Planning Department.

Q But you reviewed them?

A No, I did not review the analyses. I collaborated with them to determine what the results of their analyses were, and we used that in our analyses starting in mid-2016 up to the point where we filed for need in this docket.

Q And the load flow analysis includes modeling FPL's generation and transmission resources?

A Generally, yes; as well as FPL's load, as well as other utility loads which utilize our transmission system to be served.

Q So load flow analysis looks at literally thousands and thousands of contingencies on transmission

lines in order to determine that a regional imbalance situation has occurred, or is projected to occur; is that correct?

A In part, yes. It looks at contingencies, not just on the transmission system, but contingencies with our general evaluation system as well as different -- different loads.

Q In addition to megawatts and megawatt hours load flow analysis examines megabars?

A That's my understanding, yes.

Q FPL's transmission system planning group assist with load flow analysis, correct?

A I think I would more correctly term it as they perform the analyses. They don't assist with them.

Q And FPL had documentation of the load flow analysis completed before FPL filed its petition in this proceeding?

A Let me see if I can clarify the question. Do you mean we had performed those analyses before we filed for our petition?

Q You can answer that question. Yes.

A If you will accept that question, then the answer is, yes, we performed load flow analyses before we filed the petition.

Q And those analyses were documented?

A They were documented in the Siemens PTI computer model, yes.

Q FPL plans to place the Corbit Sugar Quarry, also known as CSQ Transmission Line, into service by mid-2019, correct?

A Yes, and construction is underway on that line.

Q And turning to the scenario where Lauderdale Units 4 and 5 are retired in 2018, if the CSQ Transmission Line goes into service as planned in 2019, you project no potential imbalance issues in southeastern Florida until 2025; correct?

A That was the earliest date at which the load flow analysis model projected that we would be running into significant imbalance issues, or have significant imbalance concerns.

Q CPVRR stands for Cumulative Present Value Revenue Requirements, correct?

A Yes.

Q CPVRR is a measure of cost to customers, correct?

A Yes.

Q According to calculations presented in FPL's petition, the CPVRR for Plan 2 is 65 million 394 -- excuse me -- 65-thousand-394-million, correct?

A Could you repeat that number, please?

Q 65-thousand-394-million.

A CPVRR, yes.

Q Commission staff Interrogatory 58 asked about a scenario which brings DBC on-line in 2024. That is six years after retiring Lauderdale Units 4 and 5 in 201, correct?

A Yes.

Q For purposes of our discussion, let's call this the six-year window scenario.

Staff in Interrogatory 58 asked for the CPVRR for the six-year window scenario, correct?

A It did.

Q FPL answered Interrogatory 58, correct?

A We answered both with text and with the calculation that was requested.

Q And you signed an affidavit certifying the accuracy of FPL's answer?

A Yes, of both the text answer and the numeric answer.

Q In that answer, FPL objected to the six-year window, correct?

A We said it was unrealistic. It put too much risk --

Q Excuse me, I just want to -- I just want to

move on to another question, if I may. I think it will be --

A If you will repeat the question, I will try again.

Q In that answer, FPL objected to the six-year window. I am asking just to affirm that.

A I do not --

Q Did FPL object or not?

A I do not know -- I do not recall if our attorney's objected to it. I know that we provided both a text and numeric answer.

Q Okay. You certified FPL's calculation that the CPVRR for the six-year window scenario is 65-thousand -- excuse me -- 65-thousand-367-million, correct?

A CPVRR, yes, that was the value for that unrealistic scenario.

Q In other words, the six-year window scenario could cost customers $27 million less than FPL's preferred Plan 2, correct?

A If one were to ignore it was an unrealistic situation, the answer would be yes.

Q Let's turn to FPL's other analysis of delaying DBEC.

You have testified to FPL's analysis of a

resource plan where the in-service date of DBEC was delayed by one year, to 2022, correct -- 2023?

A A one-year delay scenario?

Q Yes.

A Yes, we ran that, and that's in my direct testimony.

Q You also testified to FPL's analysis of a resource plan where the in-service date of DBEC was delayed by two years, to 2024, correct?

A That is correct.

Q But you have not testified to any analysis by FPL of the economics of delaying DBEC by more than two years, correct?

A That is correct.

Q Before Commission staff asked in Interrogatory 58, FPL had not analyzed the economics of the six-year window scenario, correct?

A That's correct, because we knew what the answer would be having done the one-year and the two-year delay.

The one-year delay was 12 million higher cost to our customers. The two-year was 38 million higher cost to our customers. A three-year would have been even higher cost to our customers.

Q Okay. In its 2017 analysis for this docket,

FPL evaluated delaying bringing DBEC into service by one year, until 2023, as we just said. In FPL's petition, a one-year delay is described as Plan 4, correct?

A I don't recall whether it was FPL called it Plan 4, or whether your witness called it as Plan 4, but we will refer to it as that. Yes, one-year delay would be Plan 4.

Q And that was also premised on Lauderdale 4 and 5 retiring one year later, in 2019?

A Yes, based on the specific guidance we received from our system operations group.

Q In its 2017 analysis, FPL also evaluated delaying DBC into service by two years, to 2024, correct?

A Yes.

Q And that was identified in FPL's petition as Plan 5, correct?

A We will refer to it as Plan 5, yes.

Q And that, likewise, was premised on Lauderdale 4 and 5 retiring two years later, in 2020?

A Yes; again, on the specific guidance from our system operators in order to minimize operational risk.

Q Plans 4 and 5 include the same four-year window between retiring Lauderdale 4 and 5 and bringing DBC on line, but move those dates forward by one and two

years respectively?

A I am sorry, could you repeat?

Q Plans 4 and 5 include the same four-year window between retiring Lauderdale 4 and 5 and bringing DBEC on line, but move those dates forward by one and two years respectively?

A Yes.

Q This four-year window corresponds to the same four-year window that was used in Plan 2?

A It does correspond -- it does match the same four-year window, but we pick up additional risk for the operators in both of those scenarios.

Q When FPL filed its petition, you had no idea whether there was any documented analytical basis for the four-year window, is that right?

A Repeat the question, please.

Q When FPL filed its petition, you had no idea whether there was any documented analytical basis for the four-year window?

A In part yes. In part no.

We had no analysis which showed that. What we had was a detailed discussion between myself, the Transmission Planning Department and the System Operations Department in which we discussed those delay scenarios. And in that discussion, we received very

specific guidance from our system operators that if we were to delay the replacement capacity that we would lose from retiring Lauderdale, and delay Dania Beach one or two years, we would be picking up additional risk.

Q So my question was just weather or not that was documented. If you could please --

A And my part of the answer was we did not document it, but it does not mean it was not thoroughly vetted. It was.

Q In fact, until at least the end of November of 2017, you are aware of any documented analytical basis for the four-year window; correct?

A That's correct, but none was needed. I am -- I work frequently with those two departments on a verbal discussion basis, and we operate very successfully that way.

Q You have described your role as directing and performing analysis that are designed to determine the magnitude and timing of FPL's resource needs and then developing the integrated resource plan with which FPL will meet those resource needs, correct?

A In part. I have also described it as looking at ways in which we can improve the economics for our customers as well as maintain and enhance system reliability.

Q In carrying out the role that I identified, can you identify any time in the past where, in a need determination proceeding, you have relied on reliability criteria to assess the magnitude and timing of FPL's re -- FPL's resource needs where there is no documented analysis for that reliability criteria?

MR. COX: Object to the compound question.

CHAIRMAN GRAHAM: Can you split that question into two pieces? If not, just repeat it.

BY MS. KAPLAN:

Q In a need determination proceeding in the past, have you relied on reliability criteria to assess the magnitude and timing of FPL's resource needs where there is no documented analysis for that analytical -- for that reliability criteria?

A The answer is no. And I don't believe that's the case in this docket either.

The reliability criteria we used, both our 20 percent minimum total reserve margin and our 10 percent minimum generation only reserve margin, as well as the load flow analyses that were performed by our transmission department, have all been well-documented, and that's what we used to develop the resource plan.

I think what you are referring to is a couple

of what ifs. What if Dania Beach were to be delayed a year? And in that, we relied on specific guidance from our System Operations Department as to how to go about that while minimizing the risk to our customers.

Q I would like to turn to staff's demonstrative exhibit entitled "Area Reserve Margin".

CHAIRMAN GRAHAM: Where is that exhibit?

MS. CSANK: Mr. Chairman, just one moment. Can we just pass that out?

CHAIRMAN GRAHAM: I think staff is passing it out now.

MS. CSANK: Thank you.

CHAIRMAN GRAHAM: We will give this number 61 and call it area reliability reserve table.

(Whereupon, Exhibit No. 61 was marked for identification.)

CHAIRMAN GRAHAM: Dr. Sim, do you have it?

THE WITNESS: Yes, I do.

CHAIRMAN GRAHAM: Sierra Club.

BY MS. KAPLAN:

Q This exhibit identifies that it is based on FPL's response to staff's Fourth Set of Interrogatories No. 76. Do you see that at the bottom?

A I do.

Q Looking at this area reserve margin

Demonstrative exhibit, if we compare megawatts provided under Plan 3 as compared to under Plan 2, we see, in 2018, 101 megawatts of capacity more than Plan 2. Does that look right?

A Let me just --

MR. COX: Can I get an objection? This is -- this is beyond the scope of his direct testimony. This is actually a discovery response that Mr. Sanchez, our Witness Sanchez sponsored. So it really doesn't even go to his direct testimony as at all.

CHAIRMAN GRAHAM: Sierra Club.

MS. KAPLAN: We think it does relate to his direct testimony. We think that it's germane to the difference between Plan 3 and Plan 2, and it's a fairly easy what way to demonstrate it because staff was able to put this document together. It's a way to demonstrate the difference in generation capacity year by year prior to 2022.

THE WITNESS: If I may add that, in resource planning, we not use this area reliability margin. It is strictly an operational calculation. I have not done these calculations. I do not use these calculations. Therefore, I would respectfully suggest that Mr. Sanchez would be the appropriate

witness to discuss this.

CHAIRMAN GRAHAM: Mr. Sanchez, you say, will be the witness that can answer this question?

THE WITNESS: Yes, sir.

CHAIRMAN GRAHAM: Okay. Let's move on to Mr. Sanchez for that specific question.

BY MS. KAPLAN:

Q Are you aware of the difference in megawatts in the years preceding 2022 between Plan 2 and Plan 3?

A I am sorry, I don't understand the question.

Q In Plan 3, FPL adds a certain number of megawatts to reach the same number of megawatts as Plan 2 in 2022, correct?

A Yes. It begins to add both DG solar, Distributed Generation Solar, as well as some storage in years earlier than 2022, if that's the point you are trying to make.

Q So if you look at SRS Exhibit 3, would that convey that there is far more capacity in 2018 due to the additional 100 megawatts of storage and the 150 megawatts of solar in Plan 3 than under Plan 2?

A I think it's a judgment call as to whether it is significantly more, but it's more. It would be 100 megawatts of storage, we would take at face value. And the DG solar, we would take at probably -- well,

less than half of that name plate rating. So ballpark, maybe 175 megawatts. If that's significantly more, then that's your judgment call.

Q And likewise, if you turn to 2022, at that point, there is at least -- okay, if you turn to 2021, there is a couple hundred megawatts or more of capacity under Plan 3 than under Plan 2?

A Yes. In the interest of moving along. There is more firm capacity in Plan 3 up to the year 2022 than there is in Plan 2, which features Dania Beach. However, Plan 3 costs -- would cost our customers $1.3 billion more than would Plan 2.

Q And these additional generation components in Plan 3 are beyond the 20 percent reserve margin that we see until 2022, is that correct?

A I am sorry, are beyond what?

Q What is required for the 20 percent reserve margin.

A They are above the minimum 20 percent reserve margin.

Q You haven't quantified the reliability benefits of exceeding the 20 percent reserve margin, correct?

A Can you explain your question a bit?

Q Have you analyzed how much benefit customers

would get as compared to -- how much benefit customers would get from exceeding the 20 percent reserve margin under Plan 3 in the years prior to 2022?

MR. COX: Objection, vague. The term benefit has not been defined.

CHAIRMAN GRAHAM: Sierra Club.

MS. KAPLAN: I used the term reliability benefits. I think that's something that has been used in other contexts in this proceeding. It's the benefits that would relate to reliability to be able to keep the power on, I suppose.

CHAIRMAN GRAHAM: Dr. Sim, can you answer that question with that definition?

THE WITNESS: I will try.

CHAIRMAN GRAHAM: Thank you.

THE WITNESS: I think it's a two-part answer.

The first part of your qu-- is I disagree with the premise of your question that we are exceeding the 20 percent reserve margin. The 20 percent reserve margin is a minimum, therefore, I don't think we can exceed it. We can have a value that's higher than 20 percent, but we are not exceeding that criteria.

Second of all, all else equal, as long as the other reliability criteria are met. I think it is

just common sense that the higher the reserve margin, the greater the reliability.

BY MS. KAPLAN:

Q Increases in generation reserves at a certain point provide diminishing returns, correct?

A Probably at some point, yes. But I don't believe we have come near that -- what that point is.

Q And have you analyzed what that point is?

A No, we haven't. But I will say that it -- the reserve margins we are looking at in this docket in certain years go 26 percent, et cetera. We have seen reserve margins in our plans in years past that have exceeded that. In fact, in the last two site plans, we have -- two-year site plans, we have had values in that same range of 26 percent. So it's fairly common.

Q Let's turn back to your Exhibit SRS-2, please.

A I am there.

Q In 2024, you have projected a 54-megawatt system reserve margin shortfall, correct?

A Based on just the 20 percent total reserve margin, yes.

Q There are many ways to meet that projected shortfall. One is to add generation in Southeast Florida, correct?

A You could add -- yes.

Q Another is to add generation outside Southeast Florida, correct?

A Yes.

Q Yet another is to purchase that power from third parties?

A Yes.

Q In other words, to meet that 54-megawatt system reserve margin shortfall in 2024, FPL is not limited to adding combined cycle technology at the Lauderdale site, is that correct?

A That's correct. And in our 2016 analyses, we looked at 33 different resource plans that looked at solar storage, DSM, combined cycles, combustion turbines both inside and outside Southeast Florida.

Q None of the plans that FPL analyzed in 2017 added 50 more megawatt -- megawatts equivalence before 2024, is that correct?

A That's correct, for good reason.

Q FPL limited the large-scale solar in Plan 3, 433 megawatts, based on the number of sites it thought were available within Southeast Florida, correct?

A I disagree with the way you phrased it.

We didn't limit it. We have a group at FPL that has been scouring the state of Florida, certainly our service territory, for sites that are suitable for

universal solar. They have, to date, and as of yesterday, they have found five sites in Southeast Florida suitable for universal solar. In our analyses, we assumed, out of a sake of conservatism, that there was a sixth site that somewhere would be found.

So we didn't limit anything arbitrarily. We identified five sites after a rather massive efforts that is ongoing to look for sites, and then we added one more just for the sake of our analyses.

Q With respect to each of those sites, the solar that FPL contemplates developing is limited to 74.5 megawatts, is that correct?

A I think that's the maximum we could build on those sites. I think one of the sites is probably, at last look, probably closer to a maximum of 60 megawatts on the site. So we assumed five sites at 74.5 and one site at 60.

Q Another reason is that if FPL goes over the 75 megawatts of solar, it's subject to the Florida bid rule, is that correct?

A That is certainly correct.

Q The Florida bid rule would require FPL to put the project out to bid, correct?

A It would.

Q And then that would allow third parties to

build on -- to bid on building the project themselves, correct?

A It would.

Q Isn't it true that the footprint of the solar on many of the sites upon which FPL has installed solar throughout its territory is smaller than the sites themselves?

A I am sorry, can you repeat?

Q Isn't it true that the footprint of the solar on many of the sites upon which FPL has installed solar is smaller than the site them -- the sites themselves?

A Let me see if I can answer your question this way: In our 2017 and 20 -- or 2017-2018 SoBRA docket, FPL Witness Brannen produced, in one of his exhibits, information that described what the size of the sites were. The total sites averaged about 9.6 acres per megawatt of solar. However, some of that land, which was required in the purchase, was land that was unsuitable for solar. They were wetlands. There might have been trees. There might have been structures on it, et cetera.

The fenced in, what I will call the working solar area, was about six acres per site. So we had to purchase the 9.6 in order to secure enough land for the universal solar sites to get 74.5 megawatts on it.

Q With respect to any of the properties that you have just described, has FPL analyzed the potential value of building solar on a larger footprint at a site?

A Let me ask a clarifying question.

Are you asking are -- would we be expanding the 9.6 acres per megawatt? Or are you asking would we extend the size of the solar facility to more than 74.5?

Q The ladder.

A We have examined it. We thought that, as Witness Brannen said in the SoBRA docket, that we had gotten to the sweet spot of economies of scale at 74.5. And it obviously has the added benefit of keeping us under the bid rule, which would add more cost and more time to the SoBRA projects, which we were trying to move expeditiously on.

Q And is that documented somewhere?

A I believe Mr. Brannen's testimony is on record in the SoBRA docket.

Q Is it documented anywhere in this proceeding?

A No. The question wasn't asked until this point. We assumed that 74.5, which we've identified as a company is the right size for solar, would be where we would -- or what we would building go forward unless we phased a site such as the one identified in Southeast Florida that could only hold a maximum of 60 megawatts.

Q Did FPL analyze solar located outside of Southeast Florida as an alternative to DBEC?

A I would say yes. We assumed that we would be building a lot of universal solar outside of Southeast Florida. In the 2016 analysis -- let's -- let's -- let me walk back to the 2016 10-year site plan.

At the beginning of 2016, we were projecting, beyond the solar we were adding in 2016, we would only be adding 300 megawatts additional of universal solar. All of that was projected to be outside of Southeast Florida.

When we got into the mid-2016, the beginning of these analyses, we had identified additional sites. We had identified that we thought solar could be built in those areas cost effectively, so we increased the 300 megawatts to 1,700 megawatts of universal solar.

Then by the time we got into the 2017 analysis and refreshed all of our assumptions, that 1,700 megawatts of universal solar outside of Southeast Florida had grown approximately 2,100 megawatts of universal solar.

So all of our analyses assume, all of the plans, that there is 2,100 megawatts of universal solar outside of Southeast Florida, and that that -- and that more solar outside of Southeast Florida would still face

the same reality that we only had a finite amount of transmission import capability into Southeast Florida. It doesn't matter whether we built another 10,000 megawatts of solar outside of the region, or 10,000 megawatts of gas or nuclear, we still couldn't get it into southeast Florida.

Q I think you have kind of gone far enough along with the question that I asked, and I would like to move on, if that's okay.

A That's fine with me.

Q Did you consider the use of smaller utility scale projects that average between two and 20 megawatts in size that could be sited on smaller plots of land than that needed for the 74.5 megawatt solar project?

A Yes. In our Plan 3, we assumed distributed generation solar that ranged from, I believe 250 kW to 500 kW, and we included that in Plan 3. In fact, we included 600 megawatts of that in Plan 3.

Q Did you ever put something like that out for bid to determine whether there would be a PPA that could meet that?

A Again, part yes, part no. We did not put out a PPA for 600 megawatts of rooftop solar.

Our engineering and construction group, which works both for NEER as well as for FPL, their sole job

is to figure out what the cost and the constraints are in regard to all types of generation resources, be it solar, be it storage, be it combined cycle, et cetera. So they have up-to-the-date, up-to-the-minute accurate market cost information regarding all of these options, and we relied on them.

MR. COX: Chairman Graham, could I just -- a clarification from counsel, the last question or two, were you referring inside or outside of southeastern Florida?

MS. KAPLAN: Inside.

MR. COX: Inside. Thank you.

BY MS. KAPLAN:

Q Did you review the transmission affect of distributed energy resources?

A I am sorry, could you repeat your question, please?

Q Did you review the transmission affect of distributed energy resources?

A Can you clarify your question, please? I don't know what you mean the transmission affects.

Q My understanding is that the development of distributed energy resources can -- and their use -- can affect the traditional trickle down model of the power grid. And so I am asking if you evaluated the potential

for distributed energy resources to impact the transmission situation vis-a-vis Southeast Florida?

A Certainly in 2016 we did when we looked at a variety of resource plans. In our iteration number three, we looked at either solar alone, or storage alone, or solar and storage alone.

We assumed that the small scale solar in Dade and Broward County would receive set dollar per kW benefits that would offset their costs. And it was a slightly different value depending upon whether it was in Miami-Dade or in -- in Broward. And those -- those numbers were developed directly from all of our demand side management work. So we used those numbers as benefits for small scale solar.

Q And did you do anything beyond that specific example?

A Yes. We assumed that there would be no negative impacts in our analyses from small scale solar on the transmission or distribution system. And there is a rather spirited debate in FPL, as well as other utilities, as to what direction those impacts go.

So we gave it the benefit of the doubt. Gave it what I will call distribute -- distribution type benefits, and assumed that there were no negative impacts at all.

Q In response to request from Commission staff, you analyzed a resource plan in which solar and storage were added to FPL's system in 2025, correct?

A That is correct. I think that's -- there Scenario H, if I recall.

Q Before the request from the Commission staff, you did not analyze any resource plan in which solar and storage resources were added in 2025, correct?

A That's incorrect.

In 2016, we looked at a variety of plans in which we had solar, or batteries, or both that -- with installation dates ranging from roughly 2020 to 2030.

Q You have also testified that you changed your analysis in 2017 and -- because the assumptions were different. So subsequent to 2017, did you review the same potential for a resource plan in which solar and storage were added in 2025 before the request from the Commission?

MR. COX: Objection, compound and confusing question.

CHAIRMAN GRAHAM: Can you split that question up, or ask it again?

BY MS. KAPLAN:

Q In 2017, before staff asked you to do so, did you analyze any resource plan in which storage and solar

resources were added in 2025?

A No, because, in my opinion, there was no need to.

Shall I elaborate?

Q No, I am just trying to --

With respect to your analysis of the 2025 solar and battery plan identified in staff's discovery request, isn't it true that that was less comprehensive than your analysis of Plans 1 to 3 in your 2017 analysis?

A Can you define what you mean by less comprehensive?

Q Did you analyze the solar and storage in 2025 for different levels of fuel costs?

A I don't believe that we did. But, again, the -- with medium fuel in environmental two which is our medium environmental compliance cost, that plan was at least $370 million worse for customers than bringing in Dania Beach in 2022.

MS. KAPLAN: If I may take a short break to review my outline just to see if I can --

CHAIRMAN GRAHAM: Sure, take a couple of minutes.

MS. KAPLAN: Okay. Thank you.

BY MS. KAPLAN:

Q You agree that storage costs are declining, correct?

A Yes, and we factored that in to our analysis.

Q And that storage is projected to have reliability benefits?

A Yes, and we reflected that in our analysis.

Q Isn't it true that you don't consider reduced load growth a risk worth considering in choosing a generation resource because, in your opinion, eventually load will catch up?

A Yes. Florida's a growth state, FPL's service territory is a growth territory. With -- almost without exception from the inception of the company, load has been growing at a fairly significant clip.

Q So with respect to this docket, FPL didn't consider the potential for higher or load growth -- higher our lower load growth in evaluating plans?

A No, again, because there was no need. Of much bigger concern to us is the risk of missing fuel cost or missing environmental compliance cost. Those are the elements we looked at in scenarios.

Q Okay. That's kind of going beyond my specific question.

A It was a bonus.

Q FPL projects the DBC will operate for over 40

years, until 2061, correct?

A Yes, that's our expectation.

Q If FPL had to retire DBC early, for whatever reason, customers would be stuck paying for DBEC anyway?

A In that unlikely scenario, yes, that would be the case. But I don't view that as a realistic scenario given the location of the unit, and given the efficiency of the unit.

Q When FPL submitted its petition on October 20th, 2017, you were not aware of commitments by municipalities in FPL's service area to transmis -- to transition to 100 percent clean energy, is that correct?

A Can you repeat the question again?

MR. COX: Objection. I think it's beyond the scope of this docket.

CHAIRMAN GRAHAM: Let's hear the question again.

MS. KAPLAN: When FPL submitted its petition on October 20th, 2017, you were not aware of commitments by municipalities in FPL's service area to transition to 100 percent clean energy?

I think that is relevant. I think --

CHAIRMAN GRAHAM: I will let the witness answer the question if he can.

MS. KAPLAN: Thank you.

THE WITNESS: I will answer this in two parts. I think two parts are needed.

I was not aware of the Sierra Club's campaign for 100 under which municipalities have signed documents saying they have a target of getting to 100 percent renewables by certain dates. That is correct.

However, the second part of the answer is, I don't view what you call a commitment to be what I would term a commitment after reading the -- the Sarasota document. To me, it's -- that document says we are setting a target. It commits no funds that I can see in that document towards reaching that goal --

BY MS. KAPLAN:

Q But nonetheless --

A -- and therefore, I do not see it as a commitment. I see it as they set a target, and that's it.

Q However you see it, at the time the petition was filed, you were not aware that those municipalities had expressed a goal --

MR. COX: Objection, asked and answered.

CHAIRMAN GRAHAM: I agree.

Let's move on.

BY MS. KAPLAN:

Q Do you know the number of mayors in FPL's service area who have signed a commitment to transition away from fossil fuels to clean energy?

A I do not.

Q Do you know that the mayor of Dania Beach, Tamara James, has signed a Ready For 100 pledge?

A I am aware of that.

Q Did you know she signed her pledge in July of 2017?

A I don't know any more about it than she has signed it. I think Ms. Kingston, among our witnesses, would be the appropriate one to follow up with on that.

Q Did you take that into consideration with respect to filing the DBC need petition?

A If I wasn't aware of it, no, I didn't take it into account. If I had been aware of it, I wouldn't take it into account because -- same way I would not take into account an individual citizen planning on reducing their load through putting solar on the roof, perhaps cutting themselves off from the grid entirely. We plan for, ballpark, five million customer accounts, and we seek to do what is best for the total customer good.

Q Do you know that the Mayor of Broward County

has signed the Ready For 100 pledge?

A No. And in the interest of time, I am aware of the Dania Beach Mayor and the Sarasota Mayor, and those are the only specific examples I know.

Q You have been in meetings in which External Affairs personnel and Customer Service personnel have been present, correct?

A Over what timeframe? The answer is yes, but do you have a specific timeframe in mind?

Q The timeframe from the period of the summer through now?

A Summer of 2016?

Q 2017.

A Yes, there has been at least one meeting in which I was at that External Affairs was present.

Q And at that meeting, those personnel would have been aware of expressed desires by municipalities to receive service from a certain type of resource option, is that correct?

A That's correct. And, in fact, at that meeting, that was one of the subjects we discussed. This was after you brought out the -- or your peers here had brought up the campaign for 100, and we -- at one meeting, we asked an External Affairs representative to be present so we could ask them questions about it.

Q And when was that meeting?

A Sometime after, either the first or second of the three depositions you -- we had together.

Q And prior to that time, did you ever have a meeting with external affairs people when the preference of municipalities with respect to clean energy was discussed?

A Well, you had previously asked me from the summer of 2017 on. And, no, from the summer of 2017, I only recall the one meeting in which an External Affairs representative was present.

Q And starting in 2016, did you have any other meetings with External Affairs related --

A There were a few, but in none of those meetings were -- was this subject discussed.

Q Were there any other meetings prior to the one you mention with External Affairs where this subject was discussed relative to the DBEC?

MR. COX: Objection, asked and answered.

MS. KAPLAN: I said other meetings as opposed to with External Affairs.

CHAIRMAN GRAHAM: I will allow it.

THE WITNESS: No. As I explained before, the first time I heard reference to your campaign for 100 was when it was brought up by Ms. Csank in

the -- in the deposition, either the first or the second deposition. I would have been aware of it prior to that if I had been in an earlier meeting at External Affairs and this subject had been discussed, but that was not the case.

BY MS. KAPLAN:

Q Do you agree that diversification of generation resources improves fuel diversity?

A I will ask you to please clarify what you mean by diversification of, I think generation resources is what -- how you termed it?

Q Correct.

A If you could clarify what you mean by that.

Q Utilities use different resources for their generation, from solar, to wind, to fossil fuels, that's what I mean. I am referring to that.

A Okay. Thank you.

In general, yes, I would agree. And that's one of the reasons why FPL is pursuing -- or has pursued, not only solar, but dual fuel capable units, nuclear capacity, et cetera. So fuel diversity is one of the things we consider in our resource planning work.

Q FPL relies on gas for about two-thirds of its capacity, is that correct?

A Let me answer yes, but clarify. I think it's

about two-thirds of our energy mix, or megawatt hours that we serve, about two-thirds of it come from -- from natural gas.

Q FPL projects -- strike that one.

DBEC is projected to supply more megawatt hours over its life than if Lauderdale 4 and 5 were running for the same length of time?

A Yes, because it is, in part, a larger unit; and more importantly, it's a much more efficient unit. So we will run that unit and back down generation from other facilities, including other gas-fired facilities.

Q One way to assess meeting fuel diversity is by looking at the megawatt hours supplied by generation, is that correct?

A In general, yes, I will accept that.

Q Do you agree that that's a proper way to measure fuel diversity?

A It is certainly one way in which one can look at fuel diversity.

Q FPL's grid is more reliant on gas than any other grid in the U.S. or Canada, correct?

A I am not familiar with all of the grids in the United States and Canada, but I would say FPL would certainly be among those most reliant upon natural gas. And that is why one of the advantages of the Dania Beach

unit is it will reduce system use of natural gas.

Q If FPL added solar or energy storage, it would be reducing its reliance on gas, correct?

A It would, and that was looked at with our Plan 3, in which we put an equivalent amount of firm capacity in solar and storage on our system.

MS. KAPLAN: No further questions.

CHAIRMAN GRAHAM: Thank you.

OPC.

MS. CHRISTENSEN: I have some exhibits.

CHAIRMAN GRAHAM: Sure. Staff, if you would help her. Thank you. Thank you.

Ms. Christensen, do you have an order you want to take these two up?

MS. CHRISTENSEN: Yes, we will be -- or I will be referring to the excerpt from the 2013 through '17 10-year site plans first. And if I can get that marked as a hearing exhibit.

CHAIRMAN GRAHAM: We will mark that as 62.

(Whereupon, Exhibit No. 62 was marked for identification.)

MS. CHRISTENSEN: And the other exhibit is, as indicated on the cover sheet, an excerpt from previously marked hearing Exhibit 52 that was already admitted into the record, specifically

staff Interrogatory No. 60. So I don't think we need to remark it, it's just for convenience of questioning.

CHAIRMAN GRAHAM: We will go ahead and mark it for convenience. We will decide if we want to enter it later. We will call that 63.

(Whereupon, Exhibit No. 63 was marked for identification.)

MS. CHRISTENSEN: Okay.

CHAIRMAN GRAHAM: Is that a concern?

MS. CHRISTENSEN: No. No. No. It's already been entered into the record as part of hearing Exhibit 52, but we can remark it as a separate exhibit as well.

CHAIRMAN GRAHAM: Okay.

EXAMINATION

BY MS. CHRISTENSEN:

Q Good morning, Dr. Sim.

A Good morning.

Q I wanted to refer you to page 18 of your direct testimony that you filed in this proceeding. Okay. And --

A Sorry, I am there.

Q Okay. Great. Thank up.

And on page 18, at the top, you talk about the

2016 10-year site plan; is that correct?

A Yes.

Q Okay. And you testified that FPL projected a need to add new resources to its system by 2024 to meet FPL's system reliability criteria, is that correct?

A That's correct, as of March -- or excuse me, April 1st of 2016.

Q Okay. And you would agree that FPL's 2016 10-year site plan projected an addition of an unsited CC unit in 2024 as a placeholder in the resource plan because no decision regarding how to address this need was required at that time; is that correct?

A That's correct. That's what my testimony says.

Q Okay. And you also testified that FPL showed a regional imbalance that was projected for the same time, which was the reason you were looking -- which is what you were looking into in 2016, is that correct?

A At approximately the same time, yes.

Q Okay. And then based on that 2016 analysis, FPL determined that it would build the Corbit Sugar Quarry line, is that correct?

A Not quite. The 2016 analysis identified lines that would be needed for each of the 33 resource plans that we examined. The Corbit Sugar Quarry line showed

up in many of those lines. Now --

Q And so is that a yes? Is that when you determined to build the Quarry Sugar Query line (sic)?

A No. I am trying to answer your question as to did our 2016 analysis determine that we would build the CSQ line, to paraphrase your question. And the answer is no. All that we were looking at in these 2016 analysis, and it kept popping up as a line that would be needed for import capability.

There were parallel analyses going on in the company on the transmission side, and they were looking at such things as critical infrastructure, and the Corbit Sugar Quarry line was being looked at there as being something that was vital for the company to add.

At the end of 2016, we showed, from the resource planning side, that the CSQ line was very useful to the company from a resource planning standpoint. The transmission planning side was looking at this as critical infrastructure. And I think when our executives looked at the results of the two analysis, they said, yes, this is something we need to add. And then the question was when do we need to add it. And then the critical infrastructure side of the discussion led us to say, we need to add this by mid-2019.

Q Okay.

A And that decision then informed our 2017 analyses as moving forward.

Q Okay. But was that decision-making process conducted during the 2016 timeframe?

A I don't know exactly when the executives made the decision. I was informed of it in early 2017. So I do not know if they made the decision in late 2016 or if they made it in early 2017, but it was somewhere in that fairly narrow range of time.

Q Okay. And the analysis that would have supported that decision would have been conducted during 2016, correct?

A The analysis on the resource planning side, yes, was the 2016 analysis.

Q And on the 20 -- on the transmission side, it would have been in that same 2016 timeframe as well?

A That's my understanding, yes.

Q Okay. And as you testified, I think just a moment ago, the QS -- or the CSQ line goes into service, you said, mid-2019, that's correct?

A Yes.

Q Okay. I think I heard several times today you referred to 20 percent reserve margin as a minimum. Are you referring to its use for resource planning purposes,

or need determination purposes, or both?

A Both. It is a reliability criteria we use for our resource planning, and because it's a reliability criteria, it comes into discussion and play in need filings.

Q Okay. Now, let me ask you to turn your attention to what has been marked for identification as Exhibit 62.

As you can see before you there is excerpted information from the 2013 to 2017 10-year site plans. Are you familiar with those documents?

A I am familiar with our 10-year site plans, but I am not familiar with a 2013-2017 10-year power plan site plan, unless you are excerpting from multiple site plans, which it appears you are.

Q Okay.

A So I am familiar with those site plans.

Q Okay. And I am going to ask you some questions about the individual site plans.

Let me have you first refer to the excerpted portion of the 2013 site plan. And as you will see, that has the cover letter, the cover page from the 10-year site plan. And then what I am going to be addressing for this in the remainder of the question is Table ES-2, which is the projected capacity changes and

reserve margins for FPL. Do you see that table for 2013?

A Yes, page 12 at the bottom of the page?

Q Correct.

A Yes.

Q Okay. And you would agree that the 2013 10-year site plan showed a reserve margin for 2013 of 28 percent, is that correct?

A Summer are reserve margin, 28 percent.

Q Okay. And the reserve margin -- you would agree that the reserve margin, and I am just going to be looking at the summer reserve margin, is above summer peak load, is that correct? The reserve --

A It's above firm summer peak load, yes.

Q Okay. Now, let's turn to the 2014 10-year site plan. And you will see the cover letter, the cover of the 10-year site plan and then ES-1, which is the projected capacity and firm purchase power charges.

Would you agree that the reserve margin for 2014 summer reserve is 28 percent as well?

A That was what was projected for 2014, yes.

Q Okay. And flipping through to 2015, you see the letter, the cover page, and then getting to the Table ES-1, you would also agree that the summer reserve margin that was projected for 2015 was 26.7; is that

correct?

A That's correct.

Q Okay. And for 2016, skipping through the letter, the cover page to ES-1 table showing summer reserve margin. In that case, the reserve margin was 22 percent, is that correct?

A That is correct.

Q Okay. And then finally, for the past 10-year site plans that I am referring to, skipping from the letter, cover page and finally to the Table ES-1 that was provided with the 10-year site plan, you see that 2017 has a summer reserve margin projected for 21.3 percent; is that correct?

A That's correct.

Q Thank you. And that's all for that exhibit.

Now, I would like to refer you to what has been marked for identification as hearing Exhibit No. 63, which was an excerpted portion of a previously entered hearing exhibit, specifically staff Interrogatory No. 60 for the next set of questions.

And I am going to ask you to flip through this exhibit until we get to the page identified as Tab 4 of 5, which is the second page from the back. And let me know when you are there.

A I am there.

Q Okay. Now, this looks at the reserve margin for the retirement of Lauderdale Units 4 and 5 in 2018, and the placement of a Dania Unit 7 in 2024, is that correct?

A That's correct, as shown in the upper left-hand corner of the table.

Q And you are familiar with this discovery response?

A Yes.

Q Okay.

A And I am also familiar that we consider this an unrealistic plan.

Q Well, I understand you have that caveat, but I am going to ask you questions about it anyway.

So let me turn your attention to what it says regarding 2017 as the reserve margin with demand response. Do you see that column?

A Yes. I believe it says 21.3 percent.

Q Okay. And I want to go through the years subsequent to that. And so just following along the same column, it shows a 21.4 percent reserve margin in 2018, is that correct?

A That's correct.

Q Okay. And looking at 2019 under this scenario, it projects a 20.3 percent reserve margin in

2019; is that correct?

A That's correct.

Q And continuing down that line, if I am looking at it correctly, in 2020 the reserve margin goes up to 21.3 percent as shown in this projection, correct?

A Yes.

Q Okay. And for 2021 and 2022, they show a reserve margin of 21.7 percent, is that correct?

A That's correct.

Q Okay. And finally in 2023, which would be the year prior to the Dania Beach Unit 7 going into service under this scenario, the reserve margin remains 21 percent, is that correct?

A That is correct.

Q Okay. Now, you would agree, just looking at the reserve margins that were provided by FPL, that none of those reserve margins under this scenario, which is the retirement of Ft. Lauderdale Units 4 and 5 in 2018 and the Dania Beach unit entering service in 2024, show a reserve margin that goes below 20 percent; is that correct?

A Yes.

Q Okay.

A From a resource planning view, that's what it shows.

Q Okay.

A That's only one perspective of system reliability.

Q And you are the resource planner, is that correct?

A I am the resource planner.

Q Okay.

A And I recognize that that is only one perspective of system reliability.

Q Okay. And I am sure we will be talking to Mr. Sanchez later.

So let me turn your attention to Tab 5 of 5, and I just wanted to draw your attention to this response.

Under this scenario, Units 4 and 5 are retired in 2018. And this scenario looks at reserve margins with solar and storage coming in in 2025, is that correct?

A Yes, this was Scenario H from staff's request.

Q Okay. In looking at that scenario, in 2024, under the reserve margin column with demand response, it shows a 20.2 percent reserve margin, is that correct?

A That is correct.

Q Okay.

A And again, we consider this an unrealistic

plan, because it is unreliable for our customers from an operational perspective.

Q But in response to the question, you would agree that it shows the reserve margin is, again, yet again, above 20 percent for the resource planning perspective, correct?

A Using only one of several important perspectives, yes, that's what it shows.

Q Okay. Now, referring to page 35 of your testimony, you discussed -- I am sorry, let me let you get there.

Okay. On page 35, you discuss the economic analysis of the three plans you evaluated, is that correct -- or that's where that discussion begins?

A Yes, on line 14.

Q Okay. And you projected a 337 CPVRR benefit under Plan 2, which is the Ft. Lauderdale Units 4 and 5 retire in 2018, and the Dania Unit 7 is placed into service in 2022, more than 4 and 5 Ft. Lauderdale units remaining in-service over that same timeframe; is that correct?

A That was -- I am sorry, that was rather long-winded. If I -- let me try to answer with what I think the question was.

It showed that Dania Beach, in 2022, was

337 million CPVRR less expensive than Plan 1, which keeps Lauderdale 4 and 5 operating.

Q And that would be over the same timeframe, correct?

A Yes.

Q Okay. And again, in your economic analysis, you show a $1.2 million CPVRR benefit, or savings to customers, under FPL's proposed plan, which is the Dania Unit 7 unit into service in 2022 over a solar battery placement option in 2022; is that correct?

A I believe the number that you quoted, or at least the way I understood it, is incorrect. I believe you said 1.2 million. It is 1,288 million less expensive than that Plan 3.

Q Okay. I stand corrected on the -- on my reading of the number.

Now, each of the plans you evaluated maintained a four-year period between the retirement of Ft. Lauderdale Units 4 and 5 and the power replacement in 2022, is that correct?

A Yes, based on the specific guidance of our system operations folks.

Q Okay. And just for clarity, when you discuss your delay scenarios under -- on page 36, and I think it goes on to page 37, those scenarios also maintained that

four-year pause period, correct?

A Yes. That's what I was just referring to, the delay scenarios.

Q Okay. So you did not do -- and I just want to make sure -- any sort of economic analysis if the pause period was five years; is that correct? In other words, if Dania Beach -- if the Ft. Lauderdale units were retired in 2018, and Dania did not come into service until 2023, did you do an economic --

A Yes, that is correct --

Q Okay.

A -- there was no economic analysis. We were originally requested to do that as one of the scenarios by staff, and they withdrew that and said just one scenario of two years of additional delay, please run the analysis for that. So we did that analysis.

Q Okay. But you would agree -- well, the 20 -- the delay of two additional years, you would agree that that showed a economic customer savings on a CPVRR basis, correct?

A Yes.

Q Okay.

A With an unrealistic resource plan compared to a realistic resource plan, instead of saving $337 million, you would take on additional risk and you

would gain --

Q Sir, I just --

A -- 27 million more.

Q -- asked whether or not it actually on an economic value basis.

And I just want you to confirm that if you delayed it a single year, you would also show a net economic benefit to customers on a CPVRR basis?

A Can you clarify what you mean "an additional year"?

Q If it was -- if the two-year -- the additional two years was reduced to a one-year period, it would still show a net economic CP -- CPVRR benefit to customers, correct?

A I suspect that it would.

Q Okay.

A Again --

MS. CHRISTENSEN: Thank you. I have no further questions.

CHAIRMAN GRAHAM: Thank you.

Staff.

MR. MURPHY: Staff has no questions.

CHAIRMAN GRAHAM: All right. Commissioners.

Commissioner Brown.

COMMISSIONER BROWN: Thank you, Chairman.

A few questions, first starting with follow-up from Sierra Club's cross.

You said part yes and part no to a question that they asked regarding procuring competitive solar PPAs. And I think you referenced that FPL has accurate market information to be able to evaluate resources. Can you elaborate a little bit more on that yes and no answer that you provided?

THE WITNESS: I will certainly try to.

Let's take solar first. As evidenced by his testimony, Bill Brannen's testimony in the recently concluded SoBRA docket, we went out for both the 2017 and the 2018 universal solar installations and we put out to bid every component; the solar panels, the inverters, the step-up transformers, even to the construction of the site.

I believe he referenced on the order of nine to 10 different parties submitted bids to competitive solicitations. And we were able to choose, I believe, the lowest priced bid in all of those categories, and then proceeded to install the SoBRA facilities, four of which just went into service a short time ago. The other four will be in service by March, I believe. And we are currently going through the same sort of

competitive solicitation for all the components for our 2019 SoBRA.

In regard to storage, we went out for competitive solicitations for the -- let me refer to it as the 50-megawatt pilot program that the Commission authorized as part of our most recent base rate case. So those solicitations are in play right now. And we expect the first of those facilities to go in roughly around March as well:

So those are recent solicitations that we have performed which informed our analyses for the cost of solar and storage in all of the analyses that led up to our filing in this docket.

And as mentioned in my direct testimony, the particular group at FPL whose job it is to develop those cost estimates are constantly talking to vendors, to other utilities, to all providers of those facilities in order to maintain a current up-to-date market view of not only what the current costs are but the current direction of those costs.

COMMISSIONER BROWN: Thank you, Dr. Sim.

I think that's excellent, and I think FPL should continue do that. But with regard to some of the testimony that was provided by Maggie Clark here earlier today from the National Solar Trade

Association, she referenced Georgia and Colorado, and their ability to get PPAs through competitively bidding out projects at $36 per megawatt hour. Is that realistic?

THE WITNESS: I wouldn't be able to answer that, Commissioner, without seeing what those numbers represent.

One can quote X number of dollars per megawatt hour and it can mean quite different things depending upon the length of time over which the prices are supposed to cover; what -- what type of services it is to cover, et cetera.

But also, from a resource planning standpoint, dollars per megawatt hour actually tells me relatively little. I want to know the firm capacity of the resource. I want to know the degradation of the resource, if any. I want to know the, I guess the capacity factor of that resource; how often it can provide energy, and at what times of the day, what times of the season it can provide it.

So dollars per megawatt hour value is one I tend to dismiss as not being very meaningful.

COMMISSIONER BROWN: Thank you.

A different line of question. You said that

adding -- I thought you said that adding the Dania Beach Energy Center would reduce reliance, actually, on natural gas. Can you elaborate on that?

THE WITNESS: Yes, Commissioner.

One of the staff interrogatories asked for a projection of natural gas use for Plan 1, Plan 2 and Plan 3. And what that shows is that we would be reducing our natural gas usage in total on our system with Plan 2 compared with the status quo plan, Plan 1.

COMMISSIONER BROWN: But obviously not Plan 3?

THE WITNESS: No, Plan 3 reduces natural gas a bit more. To put it in perspective, Plan 2 is roughly a one-percent reduction in natural gas use on our system, and Plan 2, which is 1.3 billion more expensive is just under two percent reduction in our system of natural gas usage.

COMMISSIONER BROWN: Okay. Turning on to a series of questions regarding the reserve margin. I am trying to get an understanding of what -- what triggers Florida Power & Light to determine when a need determination is needed with the reserve margin. What's that critical part -- point? Is it anything below 20 percent? Is it without demand

response? Is it with demand response? When does FPL make that determination?

THE WITNESS: I think there is several aspects of it that come into play.

Number one, we -- we definitely are driven from a resource planning standpoint by our two reserve margin criteria. We are no longer driven by loss of load probability. So when our 20 percent minimum total reserve margin or our 10 percent minimum generation reserve margin shows that we are going to fall either below 20 percent or below 10 percent, that tells us that we have a resource need.

We also look, as in this case, if there is a possibility to come in perhaps earlier than the year in which we are projecting to violate either of those reliability criteria, does it make sense to go forward with a need filing if there is significant benefits for our customers? And I believe that is the situation in this case.

Significant economic benefits for our customers. Lowering of natural gas. Lowering of emissions. And we can do it in a way that does not jeopardize the reliability, from an operational standpoint, in Southeast Florida.

COMMISSIONER BROWN: Thank you.

And in the opening statements by Sierra Club, I believe they referenced either delaying -- potentially delaying the Dania -- the need, or building up Dania in an incremental fashion. Has FPL looked at that, the ladder scenario?

THE WITNESS: I believe the closest -- the answer I believe is yes.

In staff Scenario H, they asked us to look at retiring Lauderdale in 2018 and then not adding capacity until 2025. And we, in following their instructions, it was, I believe, 433 megawatts of solar in that year and about 225 megawatts of batteries.

We looked at the analysis, we provided the results, and it came out to 370 million CPVRR worse than building Dania Beach in 2022.

COMMISSIONER BROWN: But what was the reasoning?

THE WITNESS: The reasoning was that there are additional costs on the system that would be incurred due to a fairly small amount of capacity. 433 megawatts at roughly 50 percent firm capacity value plus 225 megawatts got us to roughly 460 megawatts of firm capacity.

So there are other resources that would have to be brought in to make up the differential between an 1,163-megawatt unit and about 460 coming in in 2025. And those additional resources that had to be brought in had significant costs with them.

COMMISSIONER BROWN: Okay. So similarly, delaying Dania Beach by a year or two results in additional CPVRR costs of 12 million and 38 million, respectively, one-year and two-year delays. What are the reasons for those increase in costs?

THE WITNESS: The -- the ration -- well, there are three aspects, or three -- three cost impacts, let me put it that way.

One is there is just you are delaying the capital costs for -- let's call it a two-year delay. You are delaying the capital costs, so just the discounting reduces those capital net present value costs. There is some increase due to just inflation on the cost to -- the overnight cost to install the capacity, but that is more than overcome by the discounting. So you are gaining some fixed cost savings that way.

The second item is you are picking up a fuel

penalty. By not putting this very fuel efficient unit on the system, you are forcing our other less efficient units to run more, so you are picking up a fuel penalty, which is a cost.

And the third component is in order to minimize your operational risk, we would continue to run Lauderdale 4 and 5 for two more years before we would retire it.

COMMISSIONER BROWN: Thank you.

And would Dania Beach then be, if it gets approved by this commission, would it be the cleanest, most efficient generation that FPL has on the system?

THE WITNESS: I think, in terms of our fossil fuel units, certainly yes. It would not be as clean as our nuclear or our solar.

COMMISSIONER BROWN: Obviously, natural gas.

THE WITNESS: Yes.

COMMISSIONER BROWN: Thank you.

No more questions.

CHAIRMAN GRAHAM: Commissioner Clark.

COMMISSIONER CLARK: Yes, Chairman, a couple of quick questions.

I want to go back to one of the questions that Commissioner Brown asked about the potential cost

associated with delaying. You mentioned in there that you actually -- you gain some savings by eliminating some of the cost up front, by some of your capital costs up front, that outweighs the inflation and the potential other costs that you would incur in 2022, if you delayed the plant until then?

THE WITNESS: Let me see if I can clarify with a simple example.

Let's suppose we have $100 expense in 2022. That cost is going to be a little bit higher in '23 and '24 just due to escalation, maybe two-and-a-half, three percent, but we are discounting now a 2024 cost back two years at roughly a seven-and-a-half percent discount rate. So the escalation is -- is more than overcome by the discounting.

COMMISSIONER CLARK: Okay. I got that one.

My two questions, the reliability on DSM, and looking at the reserve margins that are calculated with and without demand response, what are you seeing -- and looking at the numbers, they look like they remain relatively stable. Are those actual realities when it comes to DSM programs, and what the trend is looking like toward the

reliability in the value of DSM?

THE WITNESS: Let me answer the question this way: I don't believe we are looking at DSM now any differently than we have over the past 10, 20 years. We adjust our numbers for what the projected kW reduction is at our peak hour due to ongoing monitoring of our programs. So we are constantly updating and fine-tuning those numbers.

COMMISSIONER CLARK: But are you seeing a trend toward less reliability of the amount of kW reduction you are getting out of DSM?

THE WITNESS: In general, no; but in the last couple of years, we ran into a situation where, primarily in the Miami-Dade County area, we were not getting what we thought we were getting from our residential load control program. And what we found after investigating the reason for this was that over the years, as we had hooked load control transponders on to air conditioning equipment, as air conditioners failed and contractors went in and replaced it, they were not rehooking up the transponders.

So we have undergone a concerted effort over the past couple of years to find those locations, offer to either rehook up the transponders or to

have the customer drop out of the program. And we have changed our software to where we can now remotely determine when a transponder has been disconnected at a particular customer's location.

So temporary problem essentially solved. We have lost a few megawatts as customers opted, well, I don't really want to sign up for the program again; but overall, the problem has been resolved.

COMMISSIONER CLARK: So you are saying that your demand response numbers are verifiable on coincident peak?

THE WITNESS: Yes. That is the effort we undertake, not only through individual monitoring, but Mr. Sanchez will tell you that he tests the system by activating the load control programs on a periodic basis to test what his computer models say he should get, and he sees what he actually got in terms of load dropping.

COMMISSIONER CLARK: My second question has to do with economic benefits.

In looking at the potential for this plant to come on-line early, I assume that you used the lease cost dispatching method for generation, you are going to dispatch generation assets, whatever is the least cost to produce at that time. If you

are using the new combined cycle units at Dania Beach, the other resources that you are displacing at that time, what happens to the power that you can generate with those units during that time?

THE WITNESS: Well, what happens is, assuming Dania Beach comes on, it's highly efficient. We would be running it, on average, probably 90 percent of the -- of the hours of the year, almost full availability.

And what happens is, because we are dispatching that over more hours of the year, we are backing down less efficient units on our system, including less efficient gas units, which is why we end up with a reduction in system natural gas.

The capacity of those other units is still there. If Mr. Sanchez and his group needs them to meet higher than expected load, et cetera, he will, of course, bring them into play.

COMMISSIONER CLARK: Can you sell that additional firm capacity? Can you sell that as firm capacity?

THE WITNESS: Perhaps. I think of any of our witnesses, Witness Stubblefield might be able to better answer that question than I would. She

works in the Energy Management and Trading Department. And although that's certainly not her area of expertise within that department, she's a little closer to it than I am.

COMMISSIONER CLARK: Then I guess I will save my follow-up questions for her then.

Thank you.

THE WITNESS: Thank you.

CHAIRMAN GRAHAM: Redirect?

MR. COX: Thank you, Chairman Graham.

FURTHER EXAMINATION

BY MR. COX:

Q Dr. Sim, you recall towards the start of the questioning from Sierra Club counsel some questions about SRS-2, your Exhibit SRS-2. And in particular, there was a question I want to ask to follow up with you on. You were asked about, did you look at a scenario in your analysis where you would just retire one of the two units for Lauderdale, do you recall that question?

A Yes, I recall that.

Q And you -- your answer, I think, was there was good reason, but you weren't allowed to provide the reason for why you didn't analyze the scenario with just one unit being retired. Could you -- could you provide that reason?

A Yes. We did talk to our power generation division regarding, does it make any sense to retire one and not retire the other? And the answer is, it really doesn't, because the units are operated as -- are maintained as a group. And the savings from retiring one of them would be fairly small compared with the savings from retiring both of them. So for that reason, we did not go forward and look at retiring just one of the units.

Q Also during that discussion, you were asked some questions about maintaining the balance of load and generation in southeastern Florida. Do you recall that discussion?

A Yes, generally.

Q Okay. Has this issue been discussed by FPL in the past in the 10-year site plans that it's filed?

A Yes, both in site plans and in need filings.

We have addressed this as a concern for planning at FPL since our 2003 10-year site plan, and in every year thereafter. It was a factor that was kind of front and center I think for the first time in a need filing in our Turkey Point 5 filing, which I believe was in 2004. And then it resurfaced again in 2011 with our Port Everglades modernization. We actually had a specific witness who testified to that in that docket.

Q Thank you.

I would like to turn to a different topic that was discussed with the counsel for Sierra Club regarding Staff Interrogatory No. 57. I don't have the exact exhibit number that that was contained in, but they were discussing Staff Interrogatory No. 57 with you. Do you recall that discussion?

A Yes, in general.

Q And you were asked some questions about delay analyses that were done for -- that were identified as Plans 4 and 5. Do you recall those questions?

A In general, yes.

Q Okay. So I think you mentioned that a four-year -- a four-year period was used from retirement to bringing the new unit on line based on guidance you received?

A In part. The four-year timetable is the fastest we could retire the unit, dismantle it and then build a new unit on the site.

In regard to that, when the system operators first heard about this, Mr. Sanchez in particular, he asked, can you do that faster? Can you build this unit by 2021? And our construction folks said, I don't think that's possible. I think probably by June of 2022 is the earliest we can do that. But even at that point,

the system operators were pushing to get this done as quickly as possible in order to minimize risk on their system.

Then when we got further out in 2017 in the analyses, and we wanted to look at a one- and a two-year delay, Mr. Sanchez, as well as the transmission planners, gave specific guidance that what we need to do is to minimize the time between when you retire Lauderdale and when you build the new unit, and anything other than a 2018 retirement and a 2022 retirement increases risk.

If the unit is delayed, you can minimize some of the front end, meaning the 2018-2019 risk of higher than expected loads and problems with generation by maintaining a four-year window, but you are pushing out the risk another year at the -- at what I will call the front end, because in 2023, your load is likely to be higher than it was in 2022. There is more uncertainty in the load forecast. There is just more operational risk.

And if you were to take the situation even further, retire in 2018 and then delay the Dania Beach unit to 2024, you have got the worst of all worlds. You have no protection from continuing to operate the Lauderdale units --

MS. CHRISTENSEN: Objection. I think this goes beyond the scope of his direct testimony, and is probably better directed at the system's operator Witness Sanchez, who is coming to testify in rebuttal.

CHAIRMAN GRAHAM: I agree.

BY MR. COX:

Q So just to clarify one thing that you did say doctor there, Dr. Sim. You did say that the minimum amount of time needed to construct the new plant from when it's retired is what?

A It's just under four years.

Q Okay. Thank you.

Do you recall some discussions of Staff Interrogatory 57, in particular of Part H, that dealt with a retirement of Lauderdale Unit 4 and 5 in 2018 and installing utility scaled solar and battery in 2025, 459 megawatts, you were asked questions about that by Sierra Club's counsel?

A Yes.

Q And I believe that's in Staff Exhibit 52 that was entered into the record.

And you said that scenario was unrealistic?

A Yes.

Q Could you explain why that scenario is

unrealistic?

A I think I was just doing that when the objection was raised.

Q Could you just briefly summarize why you viewed that as unrealistic?

MS. CSANK: Objection.

CHAIRMAN GRAHAM: That was already objected to.

BY MR. COX:

Q You were also asked some questions about SRS-2. Does FPL's resource planning reflect system growth beyond the year 2025?

MS. CSANK: Objection, leading.

BY MR. COX:

Q What is FPL's system growth beyond 2025?

A On SRS-2, Column 5, shows what the projected peak load is. And it is growing continually from year to year.

MR. COX: I am just about done, Chairman.

CHAIRMAN GRAHAM: Sure.

BY MR. COX:

Q You were asked some questions by Sierra Club counsel about your 2017 analyses that supported this need determination filing?

A Yes.

Q And I think you answered a question but weren't given an opportunity to explain why in terms of this solar and storage in 2025, why you had not analyzed that scenario previously. Could you explain why you had not analyzed that previously, which is I think consistent with 57-H that we are talking about?

A Yes. We had done significant analysis in 2016 that looked at solar and storage over a variety of timeframes. It was considerably less economic than were a number of other items, such as the early analysis in 2016 of the Dania Beach modernization.

What we sought to do in our 2017 analysis is, having examined Plan 1, the status quo plan, and examined Plan 2 with the -- with Dania Beach coming in, we recognized that Dania Beach was providing a certain level of reliability and was 337 million better than the status quo.

We set out to design a plan that would attempt to match, in terms of reliability, what Dania Beach would provide our customers, and see how the economics of solar and storage, without the need to build gas pipelines, and without the need to build expensive additional transmission lines would fair. What we wanted was an apples-to-apples, head-to-head comparison, and that's what Plan 3 got us. And it showed that it

was 1.3 billion more --

MS. CSANK: Mr. Chairman --

THE WITNESS: -- expensive than Dania Beach.

MS. CSANK: -- I would like to launch an question. The call of the question was quite different. I have, you know, listened to Dr. Sim for a while. He hasn't established the parity between Plans 1 and 2, and so for him to now go on and describe Plan 3 is far away from what, respectfully, Mr. Cox was asking about, which is an entirely different scenario.

CHAIRMAN GRAHAM: I will allow the answer.

MR. COX: Chairman Graham, just one point of order, I guess. Are we allowed to have two different counsels making objections when a witness is on the stand?

CHAIRMAN GRAHAM: Yes.

MR. COX: We are, okay. Thank you.

CHAIRMAN GRAHAM: Is that all the redirect?

MR. COX: No. I am sorry, I had a few more questions. I thought he was about to answer. I thought you said you would allow him to answer.

CHAIRMAN GRAHAM: I said I will allow his answer.

MR. COX: Oh, you allow his answer. I am

sorry. I am sorry. I apologize.

BY MR. COX:

Q Okay. You were also asked some questions about use of solar to produce reliance on natural gas by Sierra Club's counsel --

A Yes.

Q -- do you recall that?

In answer to your question, how would you apply cost-effectiveness to your analysis on that -- on that answer?

MS. CSANK: Objection. I find the question ambiguous. Could Mr. Cox please clarify?

MR. COX: Sure, I can clarify.

BY MR. COX:

Q Again, you were asked to discuss solar and how it would reduce reliance on natural gas, use of solar on FPL's system?

A Yes.

Q Would the solar need to be cost-effective?

A Yes. We would not attempt to add solar, or any other resource, if it wasn't projected to be cost-effective.

Q Okay. Turn to the last -- just a couple -- a couple of questions. Sorry, we're on OPC's questions here. I am finished with Sierra Club's.

The minimum reserve margin, 20 percent minimum reserve margin, you discussed that in relation to 10-year site plans with Exhibit 60 with counsel for Office of the Public Counsel -- I am sorry, 62. I apologize. That was 62, the excerpts from the 10-year site plan?

A Yes.

Q So -- and she went through the various ES-1 and ES-2 exhibits for the various years and noted the reserve margin for various years, do you recall that discussion?

A Yes.

Q Is the -- is the 20 percent minimum reserve margin a cap on FPL's reserve margin?

A No, it's the minimum. It's the floor.

And as her questioning of me pointed out, we have, in the site plans from 2013 on, on many occasions projected for many years to have reserve margins at least as high as what we are projecting for 2022, with the Dania Beach unit.

MR. COX: That's all my questions. Thank you, Chairman.

CHAIRMAN GRAHAM: Thank you.

Okay, exhibits. We have already done all of Dr. Sim's exhibits except for 61. We are going to

hold off until Sanchez for that one.

And 62 and 63, OPC.

MS. CHRISTENSEN: Yes, I would ask to move in Exhibits 62 and 63.

CHAIRMAN GRAHAM: Any objections to those exhibits?

MR. COX: No objections.

CHAIRMAN GRAHAM: Okay. We will enter 62 and 63 into the record.

(Whereupon, Exhibit Nos. 62 & 63 were received into evidence.)

CHAIRMAN GRAHAM: All right. Let's take a five-minute break.

Florida Power & Light, if you would bring up your Witness Feldman, and we will be ready in five minutes.

(Brief recess.)

CHAIRMAN GRAHAM: We are going to go with this witness as close to one o'clock as we can go a, maybe a minute or two over. We will find a good stopping point.

Florida Power & Light, let's have your next witness.

MR. COX: Thank you, Chairman Graham. FPLA calls its next witness, Richard Feldman.

Whereupon,

RICHARD FELDMAN

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

EXAMINATION

BY MR. COX:

Q Mr. Feldman, have you been sworn in for this hearing?

A Yes, I have.

Q Could you please state your name for the record?

A Richard Feldman.

Q Who is your current employer, and what is your business address?

A My current employer is Florida Power & Light, 700 Universe Boulevard, Juno Beach, Florida.

Q What is your current position with FPL?

A My title is Production Analysis Lead.

Q And did you cause to be filed on October 20th, 2017, 18 pages of direct testimony in this proceeding?

A Yes, I did.

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

A No, I do not.

Q If I were to ask you the same questions today as contained in your prefiled testimony, would your answers be the same?

A Yes, they would.

MR. COX: Chairman Graham, FPL would request that Mr. Feldman's prefiled direct testimony be inserted into the record as though read.

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

(Whereupon, prefiled direct testimony was inserted.)

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Richard Feldman, and my business address is 700 Universe Boulevard, Juno Beach, Florida 33408.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL or the Company) as a Production Analysis Lead in the Load Forecasting group of FPL's Finance department.

Q. Please describe your duties and responsibilities as a Production Analysis Lead.

A. I am responsible for developing the models and analysis supporting FPL's official peak demand, energy, and customer forecasts that are used in FPL's Ten Year Site Plans (TYSP) and long-term planning. I produce reports for management on a regular basis and provide variance analysis on these forecasts. I also oversee the work of more junior analysts.

Q. Please describe your educational background and professional experience.

A. I hold a bachelor's degree (B.B.A.) in economics from the University of Miami, and I completed my coursework and thesis towards a master's degree in economics from the University of Miami, along with additional graduate course work in statistics. I am also a certified Six Sigma Black Belt. As a Six Sigma Black Belt, I am trained in the use of statistical tools and techniques to

document and improve existing processes. I am also tasked with assisting others in improving their processes through the use of Six Sigma methodologies and tools.

I began my career with FPL in 1982 as a Load Research Analyst. I have since held a variety of positions in the areas of market research and economics and forecasting. I spent over ten years working for FPL Energy Services where I conducted tariff analysis and developed an electric pricing model for the Northeast U.S. I also managed an FPL real-time electric pricing program, and was the product manager for FPL Energy Services' insurance products and retail natural gas business, where I developed a retail natural gas pricing model and had profit and loss responsibility for the natural gas business. I assumed my current position in 2009.

Q. Have you previously testified on the Load Forecast before the Florida Public Service Commission?

A. Yes. I testified on the Load Forecast before the Florida Public Service Commission (FPSC) in Docket No. 150196-EI. This docket was for the determination of need regarding the Okeechobee Clean Energy Center.

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring Exhibits RF-1 through RF-3, which are attached to my Direct Testimony.

Exhibit RF-1 Total Average Customers

Exhibit RF-2 Summer Peak Load (MW)

Exhibit RF-3 Calendar Net Energy for Load (GWh)

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present and describe FPL's load forecasts, methodologies, and assumptions. These long-term forecasts include projections of customers, summer peak, and net energy for load. These forecasts are inputs into the evaluation of FPL's Dania Beach Clean Energy Center Unit 7 (DBEC Unit 7).

Q. Please summarize your testimony.

A. My testimony addresses FPL's customer growth forecast, summer peak demand forecast, and the net energy for load forecast. In my testimony, I explain how these forecasts are developed and why they are reasonable. FPL is expected to experience continued growth in its customer base through 2030. By 2030, the cumulative increase in customers from 2016 is expected to exceed 900,000. Summer peak demands are also projected to experience continued growth. Although the percentage growth rates projected for the summer peak are somewhat lower than those experienced historically, the absolute increases will remain significant. By 2030, the summer peak is projected to reach 28,422 megawatts (MW), an increase of 4,564 MW relative to the 2016 summer peak, which equates to a cumulative increase of approximately 19%. I also discuss the growth in the summer peak demand expected in Southeastern Florida and the significance of this load relative to the total FPL system load. The load in Southeastern Florida is nearly the size of Duke Energy Florida's (DEF) entire system and is part of one of the largest

Metropolitan Statistical Areas (MSAs) in the United States. Finally, I explain that a 9.0% cumulative increase in FPL's net energy for load is also expected between 2016 and 2030, a net increase of nearly 11,000 gigawatt-hours (GWh).

II. FPL'S EXISTING CUSTOMER BASE

Q. Please describe FPL's service territory.

A. FPL's service territory covers approximately 27,650 square miles within peninsular Florida, which ranges from St. Johns County in the north to Miami-Dade County in the south, and westward to Manatee County. FPL serves customers in 35 counties within this region.

Q. How many customers receive their electric service from FPL?

A. FPL currently serves approximately 4.9 million customer accounts, as shown on Exhibit RF-1. This amounts to a population of approximately ten million people.

Q: Geographically, where is the largest concentration of FPL's load?

A. The largest concentration of load is in Southeastern Florida. Although FPL's service area covers 35 counties, two counties, Miami-Dade and Broward, account for 44% of the Company's summer peak load.

Q. What is the current economic outlook for Florida?

A. Florida's economy continues to experience a broad based expansion. Florida has seen positive job growth for the last seven years with the unemployment

rate in Florida falling to its lowest level since mid-2007. The tourism and manufacturing sectors have experienced particularly strong growth over the past year. The real estate market continues to improve with positive growth in the number of housing starts as well as in housing prices. Population growth has also been strong with Florida adding more than 300,000 people to the state in each of the last three years, making Florida the third most populous state in the nation.

III. LOAD FORECASTING PROCESS AND RESULTS

Q. Please describe FPL's forecasting process.

A. FPL relies on econometrics as the primary tool for projecting future levels of customer growth, net energy for load, and peak demand. An econometric model is a numerical representation, obtained through statistical estimation techniques, of the degree of relationship between a dependent variable, *e.g.*, the level of net energy for load, and the independent (explanatory) variables. A change in any of the independent variables will result in a corresponding change in the dependent variable. On a historical basis, econometric models have proven to be highly effective in explaining changes in the level of customer or load growth.

Q. How does FPL determine the independent variables that should be used to forecast customer growth, net energy for load, and peak demand?

A. FPL has found that population growth, the economy, energy efficiency codes and standards, and weather are the primary drivers of future electricity needs. Accordingly, the models used to forecast customer growth, net energy for load, and peak demand rely on independent variables representing these various drivers. As discussed later in my testimony, the models used to forecast customer growth, net energy for load, and demand vary in terms of the specific independent variables used. However, a consistent set of assumptions regarding population growth, the economy, federal and state energy efficiency codes and standards, and weather are used throughout the load forecast.

Q. What sources does FPL rely on for projections of these independent variables?

A. The projected population growth and economic conditions are from IHS Markit, a reputable economic forecasting firm. The weather factors are obtained from WSI, a division of The Weather Company, the world's leading provider of weather data and information. Estimates of the impact of energy efficiency codes and standards are provided by ITRON, one of the leading consultants on energy issues.

IV. CUSTOMER GROWTH FORECAST

Q. Please explain the development of FPL's customer growth forecast.

A. The growth of customers in FPL's service territory is a primary driver of the growth in the level of net energy for load and peak demand. In order to project the growth in the number of customers, FPL utilized the August 2016 population projections from IHS Markit, the most current projections available at the time the forecast was developed.

Q. What is FPL's projected customer growth?

A. The number of customers is expected to grow, averaging an annual increase of 1.2% between 2017 and 2030. As shown in Exhibit RF-1, by 2030, the number of customers is expected to exceed 5.7 million. The cumulative increase in customers from 2016 is expected to reach over 900,000. This level of growth in customers is consistent with IHS Markit's population projections.

Q. Is FPL's customer forecast reasonable?

A. Yes. The forecast incorporates the most recent IHS Markit population projections available at the time the forecast was developed, relies on the sound and proven forecasting methods previously reviewed and accepted by the FPSC, and is consistent with historical trends in customer growth.

V. SUMMER PEAK DEMAND FORECAST

Q. What are the factors that affect FPL's summer peak demand?

A. FPL's peak demand has been a function of a larger customer base, weather conditions, economic growth, and energy efficiency codes and standards.

Q. What weather information does FPL utilize?

A. FPL utilizes information from four weather stations scattered throughout its service territory. Composite estimates of the hourly temperatures representative of the FPL system as a whole are developed by weighting the values by weather station with the proportion of sales served in that area.

Q. How are weather conditions incorporated into the summer peak per customer model?

A. The summer peak per customer model is calibrated using historical data on two weather series: the maximum temperature on the day of the summer peak and the sum of the cooling degree hours two days prior to the peak day. In forecasting these weather variables, FPL relies on a normal weather outlook. Normal weather is based on historical averages over the last twenty years.

Q. How are economic conditions incorporated into the summer peak per customer model?

A. The impact of the economy is captured through a variable based on Florida real household disposable income. Real disposable income is based on the real (inflation-adjusted) level of income in Florida adjusted for taxes. Florida's real household disposable income is provided by IHS Markit.

Between 2017 and 2030, Florida's real household disposable income is expected to increase at an average annual rate of 1.4%, which is the same rate experienced between 1990 and 2016.

Q. How is the impact from energy efficiency codes and standards incorporated into the summer peak per customer model?

A. A variable is included for the impact of energy efficiency codes and standards based on end-use estimates developed by ITRON, a leading expert in this area. Included in ITRON's estimates are savings from federal and state energy efficiency codes and standards, including the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and the savings occurring from the use of compact fluorescent and LED bulbs. This reduction is inclusive of ITRON's end-use engineering estimates and any resulting behavioral changes. By 2030, after accounting for the reserve margin, the cumulative reduction to the summer peak, since 2005, from energy efficiency codes and standards are expected to reach 5,735 MW. For perspective, this is larger than TECO's entire summer peak demand. It should be noted that the savings from energy efficiency codes and standards discussed here do not include the impact from incremental utility sponsored demand-side management (DSM) programs. As discussed in Witness Sim's Direct Testimony, the impact of incremental DSM is addressed in the resource planning process.

Q. What assumptions regarding the impact of energy prices were used in the summer peak per customer model?

A. The CPI for Energy, averaged over three months, was incorporated into the summer peak model as a proxy for energy prices. The CPI for Energy is provided by IHS Markit. As overall energy prices fall, more income is available for the purchase of other commodities including electricity.

Q. How is the output from the summer peak per customer model incorporated into the summer peak forecast?

A. The output from the summer peak per customer model is multiplied by the forecasted number of customers. The result is a preliminary estimate of the forecasted summer peak. The forecasted summer peak is then adjusted for the impacts from incremental wholesale loads, plug-in electric vehicles, private solar, and the economic development rider and existing facility economic rider.

Q. What is FPL's projected summer peak demand?

A. FPL's summer peak demand is presented in Exhibit RF-2. As shown on this exhibit, FPL projects an annual increase of 1.3% in the summer peak demand between 2017 and 2030. While the projected percentage growth is lower than the long term rate experienced historically, the absolute level of growth remains very large. An annual increase of 339 MW is projected between 2017 and 2030. By 2030 the summer peak is projected to reach 28,422 MW, a cumulative increase of 4,564 MW relative to the actual 2016 summer peak.

Q. Is FPL's summer peak demand forecast reasonable?

A. Yes. The forecast incorporates the most recent weather and economic assumptions and includes the most updated research on the impact of energy efficiency codes and standards. The summer peak model relies on sound and proven forecasting methods previously reviewed and accepted by the commission. The model coefficients for all of the variables have the expected sign (+/-) and are statistically significant. This indicates that the variables influencing the summer peak demand have been properly identified and their predicted impact is statistically sound. Additionally, there is no observable pattern in the residuals. Overall, the summer peak model has excellent diagnostic statistics. Finally, the summer peak forecast is consistent with historical trends in summer peak load growth.

Q. Is FPL's load distributed evenly throughout its service territory?

A. No. Much of FPL's load is located at the tip of the Florida peninsula, in Miami-Dade and Broward counties. In fact, Miami-Dade and Broward counties, which I will refer to as Southeastern Florida, contribute a disproportionate share of FPL's load, accounting for 44% of FPL's system summer peak. This represents a load of more than 10,000 MW.

Q. Please provide some perspective regarding the load in Southeastern Florida and its geography.

A. The summer peak load in Southeastern Florida is nearly as large as Duke Energy Florida's (DEF) entire system. The load in Southeastern Florida is also much more concentrated. Whereas DEF's service territory covers

approximately 20,000 square miles, Southeastern Florida, with nearly the same load, spans only 3,100 square miles. This clearly illustrates the size and concentration of load that exists in Southeastern Florida.

I would also like to provide some perspective on the population in Southeastern Florida. Based on 2016 Census estimates, the Miami-Ft. Lauderdale-West Palm Beach Metropolitan Statistical Area (MSA) ranks as the eighth largest MSA in the United States and the largest in Florida. It is nearly twice the size of the second largest MSA in the state, Tampa-St. Petersburg-Clearwater. To summarize, Southeastern Florida has a very high concentration of load in one of the largest MSA's in the country and, by itself, is roughly the size of DEF's entire service territory in terms of load.

Q. What is the forecast load growth in Southeastern Florida?

A. The load in Southeastern Florida is expected to grow by over 1,600 MW between 2016 and 2030. During this time period, customers are expected to increase by more than 297,000.

VI. NET ENERGY FOR LOAD FORECAST

Q. How does FPL forecast energy sales?

A. FPL forecasts energy sales using an econometric model for total net energy for load. Net energy for load is a measure of electric sales that takes into account the MWh FPL generates and the net flow of interchange sales into

and out of the FPL system. An econometric model for net energy for load is more reliable than models for billed energy sales because the explanatory variables can be better matched to usage. This is so because the net energy for load data do not have to be attuned to account for billing cycle adjustments, which might distort the real time match between the production and consumption of electricity.

Q. What inputs does the econometric model use to forecast net energy for load?

A. FPL has found that the customer base, weather, the economy, and energy efficiency codes and standards are the principal factors influencing net energy for load. Accordingly, a net energy for load per customer model has been developed incorporating these variables. The model output is multiplied by the number of customers to derive a preliminary net energy for load forecast.

Q. How are weather conditions incorporated into the net energy for load per customer model?

A. The weather variables included in the net energy for load per customer model are monthly cooling degree hours using a base of 72°F and monthly winter heating degree days using a base of 66°F. In addition, a second measure of heating degree days is included using a base of 45°F in order to capture the additional heating load resulting from sustained periods of unusually cold weather as occurred in January 2010.

Q. How are economic conditions incorporated into the net energy for load per customer model?

A. A composite variable based on Florida real per capita income weighted by the percent of the state's population employed is used as a measure of economic conditions.

Q. How is the impact from energy efficiency codes and standards incorporated into the net energy for load per customer model?

A. A variable is included for the impact of energy efficiency codes and standards based on end-use estimates developed by ITRON. This variable is calculated as a net energy for load per customer impact of energy efficiency codes and standards and is inclusive of ITRON's end-use engineering estimates and any resulting behavioral changes. From 2005 to 2030, the cumulative reduction to net energy for load due to energy efficiency codes and standards are expected to reach 17,324 GWh.

Q. What is FPL's projected net energy for load?

A. The projected net energy for load is shown in Exhibit RF-3. FPL is projecting a 0.8% annual growth rate in net energy for load between 2017 and 2030. This projected annual growth in net energy for load reflects the impact of continued economic and population growth. The absolute level of increase in GWh, however, is expected to be lower than that experienced historically. The forecast shows an annual increase in net energy for load of 1,033 GWh between 2017 and 2030, resulting in a cumulative increase of 13,429 GWh.

Q. Is FPL's net energy for load forecast reasonable?

A. Yes. The forecast incorporates the most recent weather and economic assumptions and includes the most updated research on the impact of codes and standards on energy sales. The net energy for load forecast relies on sound and proven forecasting methods previously reviewed and accepted by the commission. The model coefficients for all the variables have the expected sign (+/-) and are statistically significant. This indicates that the variables influencing net energy for load have been properly identified and their predicted impact is statistically sound. Additionally, there is no observable pattern in the residuals. Overall, the net energy for load model has excellent diagnostic statistics. Finally, the forecast is consistent with historical trends in net energy for load growth.

Q. Is FPL's net energy for load forecast consistent with the forecast for summer peak demand?

A. Yes. Both forecasts rely on the same set of assumptions regarding population, weather, and economic growth and rely on similar modeling techniques. Additionally, similar out-of-model adjustments are made to both forecasts.

Q. Does the 2017 TYSP forecast use a methodology and drivers consistent with previous forecasts?

A. Yes, FPL's forecasts use consistent methodologies and rely on similar drivers as previous forecasts. Econometric modeling is the tool used in developing each of these forecasts. Additionally, the same basic drivers obtained from the same independent experts are used as explanatory variables in each of

these forecasts. Each TYSP forecast uses the best and most current assumptions available at the time the forecasts were developed, and result in models that have sound model statistics. Each forecast was reasonable for planning purposes at the time the forecasts were employed. As part of FPL's on-going commitment to process improvement, minor modifications are made at times to take advantage of more current data and recent learnings in order to make improvements to the models. However, the primary drivers of future electricity needs and the forecast methodologies remain the same in all forecast vintages.

Q. What are your conclusions regarding the load forecast.

A. FPL's customers and load are expected to experience continued growth. Load in Southeastern Florida will see significant load growth. These loads, located at the tip of the Florida peninsula, are expected to grow by over 1,600 MW between 2016 and 2030.

Q. Does this conclude your direct testimony?

A. Yes.

BY MR. COX:

Q Mr. Feldman, I think this was discussed earlier, but you did have Exhibits RF-1 to RF-3 attached to your direct testimony?

A That's correct.

Q And we did note corrections for the record to those two exhibits, RF-2 and RF-3. And the three exhibits have been identified and admitted in the record as Exhibits 6 through 8 on the staff comprehensive exhibit list.

A Correct.

Q Mr. Feldman, have you prepared a summary of your direct testimony?

A Yes, I have.

Q Could you please present your summary to the Commission at this time?

A Yes.

Good afternoon, Chairman Graham and Commissioners. The purpose of my testimony is to present and describe FPL's load forecast methodologies and assumptions that were utilized in the analysis that led to the FPL selection of the proposed Dania Beach Clean Energy Center Unit 7. Specifically my testimony supports the company's forecast of customers, summer peak demand and energy sales.

My testimony will discuss the significant load growth expected in FPL's service territory and in the southeastern Florida region. I will also explain how these forecasts were developed and why they are reasonable.

Our for is cast show that the FPL system is expected to experience continued growth in its customer base and in its summer peak demand through 2030. While the forecast growth rates are below what FPL has experienced historically, FPL's absolute customer growth and load growth are expected to be significant over the forecast horizon.

The cumulative increase in customers from 2016 to 2030 is expected to exceed 900,000. Summer peak demands are expected to reach 20,422 megawatts by 2030, an increase of more than 4,500 megawatts from 2016 summer peak.

The forecast also projects a nine percent cumulative increase in energy sales between 2016 and 2030. That's a net increase of nearly 11,000 gigawatt hours.

Southeastern Florida, which is comprised of Miami-Dade and Broward Counties, represents 44 percent of FPL's summer peak load. For perspective, the current load in southeastern Florida is nearly the size of Duke

Energy Florida's entire system. This region is also expected to experience significant load growth. The load in southeastern Florida is expected to grow by over 1,600 megawatts between 2016 and 2030.

In developing these forecasts, FPL utilized the most current information available and relied on inputs developed by leading industry experts. Our forecasts are supported by statistically verified models using methodologies that have been reviewed and accepted by this commission in past cases.

In summary, FPL's load forecasts call for continued growth at both the system level and for southeastern Florida that will, over time, lead to substantially higher levels of customers' peak demand and energy sales. FPL's load forecasts are appropriate for use in evaluating FPL's proposed Dania Beach unit and should be approved for use in this proceeding.

Thank you.

Q Thank you, Mr. Feldman.

MR. COX: Chairman Graham, the witness is tendered for cross-examination.

CHAIRMAN GRAHAM: Sierra Club.

EXAMINATION

BY MR. LENOFF:

Q Good morning, Mr. Feldman --

A Good morning.

Q -- I guess good afternoon.

A Yes.

Q So in your testimony, you state that you use population projections from IHS market to forecast the number of FPL customers, correct?

A That's correct.

Q And the IHS data is from August 2016?

CHAIRMAN GRAHAM: Sir, can you pull that microphone down a little bit? You are hard to hear.

MR. LENOFF: Better?

CHAIRMAN GRAHAM: Yes.

MR. LENOFF: Thank you.

BY MR. LENOFF:

Q And the IHS data is from 2016, is that correct?

A Yes, that is correct. That's the latest forecast available at the time the forecast was completed.

Q And have you considered more recent data for purposes of this docket?

A What do you mean "considered more recent data"?

Q Have you -- for your analysis that you have

done for purposes of this docket, have you used data on -- to forecast the number of FPL customers that is more recent than the August 2016 data that we just discussed?

A No, I have not.

Q Okay. So you don't know if your figures are out-of-date or -- or, you know, have been superseded by different numbers?

A Well, there will be a new official forecast coming out in February. That will have more up-to-date population numbers.

Q So would you recommend that the Commission wait until that forecast comes out to make its determination on the need for the plant?

A No, I would not.

Q Okay. So -- but your figures that you used could potentially be out-of-date based on those numbers?

A I wouldn't use the word out-of-date. The figures might change. They might be higher and they might be lower. At this time, I don't know what the difference will be between a more current forecast and the one used in this case.

Q Okay. So your prefiled testimony states, and I believe you mentioned this in your opening, that the peak load in Southeast Florida is expected to grow 1,600

megawatts between 2016 and 2030, correct?

A That's correct.

Q And do you expect that load growth to occur all at once?

A It will occur over the 14-year time period from 2016 to 2030.

Q And it will occur all at once during that period, or how will it occur during that period?

A I believe during that time period, the compounded annual growth rate is about 1.1 percent per year.

Q Okay. So you expect it to grow about 1.1 percent every year?

A Roughly 1.1 percent.

Q All right. And so just to maybe put some numbers to -- we established that you expect it to grow by about 1,600 megawatts, and you say that there is 14 years between 2016 and 2030. That's a little bit over 100 megawatts per year, is that correct?

A That math sounds about right.

Q Okay. The summer peak per customer model that you discuss in your testimony includes an input for the impact of energy efficiency, is that correct?

A Yes, that's correct.

Q And that input, you state in your testimony,

is based on end-use estimates developed by Itron, is that correct?

A Yes. It's based on analysis -- on models developed by Itron for each energy efficiency program.

Q Okay. And the estimates from Itron include savings from federal and state energy efficiency programs --

A Yes, that's correct.

Q -- that's correct?

And that data includes -- and that includes data from places outside of Florida, isn't that correct?

A I am sorry, could you repeat that?

Q The data -- the estimates from Itron include savings from federal and state energy efficiency programs which is data that is sourced, at least in part, from places outside of Florida?

A Yes, it is, but Itron takes those data and -- and applies it to an FPL system.

Q Can you -- what was that first word that you said? You -- what was the verb? Can you repeat your answer?

A Yeah. Itron basically takes the national mandated energy efficiency standards and applies it to FPL's system to get estimates of the impact on FPL's system of energy efficiency programs.

Q And they do that using data from outside of Florida?

A Some data are national, yes.

Q Okay. And in coming up -- in coming up with the forecast of peak load and net energy load in your testimony, you used data from the past to make projections about the future, correct?

A That's correct.

Q And is there a better way to make projections about the future without using data from the past?

A Without one knowing the future, I believe that's the best way to predict what -- the future is based on historical relations of the data.

Q So you would say that using data from the past is the best way to predict what's going to happen in the future?

A Yes, I think so.

Q Okay. So you forecast load for a given year three years in advance of that year, correct? So if we are forecasting a load for year X, you will forecast the load for year X three years prior; is that correct?

A In part that's correct, yes; but we forecast -- the forecast begins in the -- in the follow -- in the next year, and it goes out sometimes 60 years.

Q Okay.

A So it's not just three years out. We cast one year out, two years out, three years out.

Q All right. So you do do it for three years beforehand, though, correct?

A Yes.

Q Okay. And when doing so, forecasting three years out, you repeatedly have a larger forecast error than when you forecast load for closer to the year which you are forecasting, is that correct?

A In general, that's correct. It's not always the case, but typically you have more uncertainty -- uncertainty the farther out in time one goes.

Q All right. And that error, you would say, is how much of -- when you say in general, can you -- can you please give me a -- why did you qualify it with in general?

A Because there are some years, if -- if we look at previous 10-year site plans, there could be times when the forecast five years out from one forecast is more accurate than the forecast that was done in subsequent years.

Q Okay.

A It's just -- I mean, in general, yes, that's correct. The further out you go the more uncertainty,

but that's not always the displace.

Q Okay. In the -- for the years 2013 through 2016, when you forecasted those -- the load in those years, your forecast error -- you forecasted -- I will break it down.

A Okay.

Q You forecasted the load in -- for the years 2013 through 2016, correct?

A Correct.

Q And you did that -- you made that forecast three years prior to those years?

A So you are saying the forecast that was done in 2010 --

Q For 2013 --

A -- for 2014?

Q Correct. Yes.

And in those years, when you performed those forecasts three years prior for those years, your forecast error was larger than when you forecasted for 2013 through 2016 closer to the date which you were forecasting?

A If I understand your question, again, this goes back to more uncertainty the further out in time one is forecasting, is that your question?

Q I am focusing specifically on FPL's recent

history of forecasting -- or your recent history of forecasting.

A I don't have those numbers in front of me, so I would hesitate --

Q Can I use -- can I have one -- use an exhibit, then?

A Sure.

Q Can we do that? Give me one moment.

MR. LENOFF: Chairman, how would you like --

CHAIRMAN GRAHAM: Staff, can I get some help?

MR. LENOFF: Thank you.

CHAIRMAN GRAHAM: Thank you.

We will number this Exhibit 64.

MR. LENOFF: Thank you, Mr. Chairman.

(Whereupon, Exhibit No. 64 was marked for identification.)

CHAIRMAN GRAHAM: Mr. Feldman, do you have it?

THE WITNESS: Yes, I do.

CHAIRMAN GRAHAM: Thank you.

BY MR. LENOFF:

Q So, Mr. Feldman, you recognize the document that I just handed to you that's been marked as Exhibit 64?

A Absolutely.

Q Yeah. And it is the Response to Staff's

Second Interrogatory No. 45 from -- is FPL's response, that's correct?

A This is -- that's correct.

Q All right. And so if we turn to the page two of two, we can see FPL's response. And maybe this is clearer than my questions.

A Okay.

Q For -- if we look at, for 2013, the forecast error rate was 1.7, is that correct?

A Three years out, that's correct.

Q Three years out. Thank you. Yes.

And that number -- that 1.7 percent forecast error is larger than the forecast error for the years closer to 2013 for two years prior, one years prior and zero years prior?

A That's correct.

Q Okay. And for 2015, does the same relationship hold where the forecast error three years out is larger than the error closer to 2015?

A That is correct; however, year two forecast variance is smaller than year one and year zero.

Q Okay.

A So that's what I was saying before. It's not always the case that the further out in time --

Q I understand. I am just going to, you know --

And so for 2016, the same relationship holds again where the forecast error three years prior to 2016 is larger than any of the forecast errors for closer to 2016?

A Yes, that's correct.

Q In fact, it's at least double the forecast error of any of those other years?

A For 2016 three years out, the forecast that was done in 2014, right, is much larger than the other errors.

Q Right.

A And since this forecast was done, we have examined that model and made adjustments to it.

Q Okay. Thank you.

You sent this very recently, didn't you? That's okay.

You did not calculate, in this response to staff's interrogatory, the absolute average forecast error for these different years?

A In terms of megawatts?

Q So if I look -- if I look down to the bottom row, I see an average error, that's right, for three years prior, two years prior, one year prior and zero years prior?

A Correct. Yes.

Q But you did not calculate the absolute average in response to this?

A I believe -- I believe the last column is the absolute average.

Q No, I don't think so. I think that's -- What is an absolute average?

A Basically, you -- you ignore the -- the sign on the error. It can be positive or negative. You assume it's all positive error and take an average of that. So it's the absolute error.

Q So I have actually calculated this myself, so let's -- can we just take three years prior, and because it turns out to be a nice round number. Can you tell me what the absolute average is for your forecast made three years prior?

A For which year?

Q For all years, forecast made three years prior for all four years shown on this chart.

A Looks like it would be six percent divided by four years.

Q Right. So that's 1.5 percent? So that's not the number shown in the row that's, you know, on the sheet that says average?

A Well, the absolute average for three years is not shown on this sheet.

Q Right. But we just established that that number is 1.5 percent?

A Oh, I am sorry. Correct. Yes.

Q And, I mean, I am happy to go through the calculations for each of these -- you know, for forecasts made two years prior, one year prior, zero years prior, but can we agree that the absolute average for forecasts made three years prior would be larger than for two years, one years and zero years?

A When you take an absolute average, typically it is going to be larger. I think you see that --

Q I am asking the -- we just calculated the absolute average for three years prior would be 1.5 percent, right?

A Correct.

Q If we were to calculate -- let's calculate the average -- the absolute average for two years. And, you know, not to be pedantic, but we will say .8 plus .1 plus .5 plus .9 is 2. --

A 2.4.

Q Right, 2.4. We would divide that by four, and that gets us to about .55, .56, something like that?

A .6.

Q Right. That's larger than 1.5?

A No.

Q I am sorry, 1 -- thank you, right. 1.5 is larger than the --

A Yes.

Q -- what we just calculated, the absolute average for two years.

Can we agree that the absolute average for forecasts made three years prior would be larger than the forecast made one years prior and zero years prior as well, the absolute average of those?

A Without doing the math, I suspect that might be true.

Q Let's do the math.

A Okay.

Q .8 plus .9 plus 1.1 plus .7 is 3.5; is that correct?

A Yes.

Q And then we decide that by four, we get about 1.9?

A Correct.

Q All right.

A So it's about one point --

Q I am sorry, not one point -- what is 3.5 divided by four? It's like -- it's .9, I believe.

CHAIRMAN GRAHAM: There is a calculator right there on the desk.

MR. LENOFF: There is, yeah.

THE WITNESS: Thank you. What was the total you got for one year?

BY MR. LENOFF:

Q For one year, I got 3.5 --

MR. LENOFF: I apologize, Mr. Chairman, you know, for this math.

CHAIRMAN GRAHAM: Sure.

BY MR. LENOFF:

Q 3.5 divided by four, I get a little under 0.9. It's going to be less than one, isn't it, 3.5 divided by four is less than one?

A 0.9, correct.

Q And for zero years, I get 3.9 divided by four, which, again, is going to be less than one?

A Correct.

Q Okay. So the absolute average that we calculated for forecasts made three years prior to the date which is being forecast is larger than the absolute average forecasts made two years prior, one year prior and zero years prior?

A Correct.

Q Okay. So I hope there is no more math in my questions. I have just a few more questions, if I can find where my outline went to.

Do you agree that when FPL is forecasting load five years prior to the date forecasted, that FPL is even worse at accurately predicting load at one forecasting three years prior?

A I don't believe I have the data to agree with that.

Q You -- but in general --

A Again, the further out you go in time, the more uncertainty there is, and in general, the bigger the forecast variance is.

Q Okay. So I am going to use another exhibit that does not require us to do math.

CHAIRMAN GRAHAM: Staff.

We will number this Exhibit 65.

(Whereupon, Exhibit No. 65 was marked for identification.)

MR. LENOFF: Thank you, Mr. Chairman.

CHAIRMAN GRAHAM: What's the title for this exhibit?

MR. LENOFF: The title for this exhibit, Mr. Chairman, is Order Number 2016-0032. It is an excerpt from that commission order.

CHAIRMAN GRAHAM: All right. We will call it excerpt from order 2016-0032.

CHAIRMAN GRAHAM: Mr. Feldman, do you have

that in front of you?

THE WITNESS: Yes. Yes, I do.

CHAIRMAN GRAHAM: Sierra Club.

MR. LENOFF: Thank you, Mr. Chairman.

BY MR. LENOFF:

Q Mr. Feldman, you see the -- on page -- what is labeled page eight of this exhibit, you see the table in the middle titled "Table 1: Accuracy of FPL's Summer Peak Demand and Forecasts?"

A Yes, I do.

Q Do you have any reason to doubt the accuracy of the numbers that are included in this commission order?

A No, I don't.

Q Okay. And helpfully, the Commission established the absolute average error for us in this table for forecasts made years prior, and can we agree that the absolute error -- absolute average error for forecasts that are made five years prior to the forecast produced year is larger than the forecast error for any forecast made closer to the year for which -- that is being forecast?

A That's correct. That's not really surprising.

Q Okay.

A Especially when you take an average of so many

site plans and so many forecast errors. Again, you have times where the longer, the further away from the actual is going to have a smaller error; but, in general, like I said, the further out you go, the more uncertainty the larger the errors.

Q And can you read at the top of the page, do you agree that it says, an average, paren, open paren, AVG, close paren, error with a negative value indicates an under-forecast, comma, while a positive value represents an over-forecast?

A Yes, that's correct. At FPL, we do it -- we do it the other way around, but I understand calculating it this way.

Q Thank you for that clarification.

And can we look close to the bottom of Table 1 at the row labeled AVG error average -- which I, you know, would you --

A Sure, I understand.

Q That we -- we can agree that that, you know, means average error, you know, or is implied there.

Do you see the average error forecasts made five years prior is 3.52 percent?

A Correct.

Q And that's an over-forecast, then, of 3.52 percent -- an average over-forecast of 3.52 percent?

A That's correct.

Q Do you know the -- what 3.52 percent represents on FPL's -- what -- what 3.52 percent represents on FPL's system, how much peak demand that is?

A Well, I can do the math. But let me just point out one other thing, is that these -- these years that we are looking at here for forecast error includes the impact of the great recession, where the forecast errors were much larger than what we've seen recently, and what we've seen before that. So these numbers are kind of inflated due to the recession.

Q All right. So I -- I appreciate that clarification.

Can we look at the year 2011?

A Sure.

Q You see that FPL, for its forecast five years prior, over-forecasted by 12 percent?

A That is correct.

Q And for the subsequent year, 2012, its forecast error five years prior was 13.68 percent?

A That is correct. And those were forecasts done in 2006, 2007, before the recession; and I don't think any utility anticipated the impact or magnitude or duration of the recession. So most utilities have

forecasts even bigger than that.

Q Mr. Feldman, did I just hear -- you just told me that the forecast was made in 2006 and 2007, right? But when I look at 2012, I see that the next column over tells me that it's 2008 to 2012 10-year site plans; is that correct?

A Correct.

Q So then would you like to change the statement that you just made about 2006 or 2007?

A I was looking at the 2010-2011. That's correct. When you look at the 2011 and 2012 actual years, they were done in 2007 and 2008. Again, we didn't make adjustments to the forecast in 2009 --

MR. COX: Chairman, could we -- Chairman, could we let our witness answer the question? He keeps getting cut off by counsel.

CHAIRMAN GRAHAM: I think counsel is just trying to stop him from editorializing, but --

MR. LENOFF: Thank you.

CHAIRMAN GRAHAM: Please.

MR. LENOFF: Sure. No, I think that that's all of my questions. So thank you for your time, Mr. Feldman.

THE WITNESS: Sure. Thank you.

CHAIRMAN GRAHAM: Okay. Looks like a good

time to stop for lunch.

Right now we got five after 1:00. We will start back up again at five after 2:00, and OPC will have the floor.

We are adjourned -- or recessed, or whatever the verb. We are taking a break.

(Lunch recess.)

(Transcript continues in sequence in Volume 2.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA)
COUNTY OF LEON)

I, DEBRA KRICK, Court Reporter, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED this 22nd day of January, 2018.

DEBRA R. KRICK
NOTARY PUBLIC
COMMISSION #GG015952
EXPIRES JULY 27, 2020