State of Florida

Public Service Commission

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TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE:	December 21, 2015
TO:	Carlotta S. Stauffer, Commission Clerk, Office of Commission Clerk
FROM:	Moni Mtenga, Engineering Specialist, Division of Engineering
RE:	Docket No. 150000-OT-Undocketed Filings for 2015

Please put the attached letter from the Sierra Club regarding "Missing Alternatives from 10-Year Site Plan" in the Undocketed filings for 2015.

Thank you.

Terri Jones

From: Moni Mtenga
Sent: Monday, December 21, 2015 10:47 AM
To: Terri Jones
Subject: FW: Undocketed: 10-Year Site Plans
Attachments: 2015 12 15 Sierra Club Letter re Missing Alternatives in TYSP v fin.pdf

Terri,

This needs to filed in the undocketed docket. Thank you.

From: Diana Csank [mailto:diana.csank@sierraclub.org]
Sent: Tuesday, December 15, 2015 2:20 PM
To: Office Of Commissioner Graham; Office Of Commissioner Edgar; Office of Commissioner Brown; Office of Commissioner Patronis; Office of Commissioner Brisé
Cc: Tom Ballinger; Phillip Ellis; Moni Mtenga; lharvery@psc.state.fl.us; Paul Vickery; Records Clerk
Subject: Undocketed: 10-Year Site Plans

Dear Commissioners:

Attached please find Sierra Club's letter respectfully requesting that in advance of next April's 10-year site plan deadline, the Commission direct each utility to submit "possible alternatives to the proposed plan" as required by Section 186.801(2), Florida Statutes ("F.S."), as well as supporting information to evaluate those alternatives.

Regards,
Diana

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SIERRA CLUB

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SIERRA CLUB

December 15, 2015

Via Electronic Mail

Chairman Graham, Comm'rs. Brisé, Edgar, Brown, and Patronis
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, Florida 32399-0850

Re: Missing alternatives in 10-Year Site Plans

Dear Commissioners:

On behalf of its more than 30,000 Florida members, the Sierra Club respectfully requests that in advance of next April's 10-year site plan deadline, the Commission direct each utility[1] to submit "possible alternatives to the proposed plan" as required by Section 186.801(2), Florida Statutes ("F.S."), as well as supporting information to evaluate those alternatives. To date, utilities have not provided such alternatives analyses to the Commission.

Florida law requires that at least every two years utilities submit "10-year site plans" to the Commission that outline the utilities' plans for ensuring that they deliver Floridian's electricity in a manner compliant with state law. The Commission must study the plans using a set of 10 criteria specified by statute. If the plans comply with those criteria and meet other objectives specified under state law, the Commission is to find the plans "suitable." Otherwise, the Commission is to determine the plans are "unsuitable."

For the reasons discussed below, to fulfill its duty the Commission should direct the utilities to submit robust alternatives analyses and supporting information. If the utilities fail to do so, the Commission must reject those plans as unsuitable. Consideration of alternatives is a mandatory part of the Commission's 10-year site plan reviews under Florida law, a common practice of regulatory utility commissions nationwide, and a matter of common sense. Just as smart consumers conduct comparison shopping before making purchases, especially of big ticket items, the utilities must allow the Commission—on behalf of Florida's electricity consumers—to do so.

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[1] The Commission's Rule 25-22.071, Florida Administrative Code ("F.A.C") specifies the utilities that are subject to the 10-year site plan filing requirements.

Thus far meaningful comparisons between the utilities' proposals and alternatives have been precluded by the utilities' practice of presenting the Commission just their preferred generation plans and simply asserting that alternatives were considered but discarded as inferior. Without more information on the possible alternatives—including enough details for independent comparison of alternatives to the plans proposed by the utilities—the Commission cannot fulfill its oversight duty to ensure that Floridians are getting the best deal, as the Commission is required to do under the law. This is particularly true with respect to renewable energy and energy efficiency resources, which the Florida legislature has repeatedly and expressly asked the Commission to analyze.

The lack of robust alternatives analyses carries significant consequences. For example, the utilities have proposed to add large conventional power plants in their preferred plans. This commits significant amounts of Floridians' money to building out fossil fuel and nuclear infrastructure with payback periods measuring in the decades at a time of great change in the energy sector. It presents outsized risks, especially given an evolving regulatory environment around coal and carbon, and Florida's over-reliance on natural gas.

In contrast, Florida has an unprecedented opportunity to meet its electricity needs through low-cost, low-risk renewable energy and energy efficiency resource alternatives. This opportunity—and the need for Commission oversight to ensure that all utilities pursue it optimally—is perhaps best illustrated by the state's municipal utilities citing historic cost savings as they add in-state solar photovoltaics ("PV") to the grid at more than five times the speed (kWh of per customer) at which investor owned utilities are doing so in Florida. Indeed, across the country commissions and utilities are investing in renewable energy and energy efficiency at far greater speed than Florida's investor owned utilities, and they are doing so because it is more economical than Florida's heavy investments in natural gas. It is particularly notable that investor owned utilities such as Florida Power and Light and Duke Energy Florida are proposing so little renewable energy in Florida when in other states NextEra (FPL's parent company) and Duke are building out these resources as a cost-competitive option.

Timing is critical. Once a utility invests substantial resources into pursuing its proposed plan, it often constrains the possible alternatives that can be pursued, due in part to resource constraints and in part to the time it takes to plan, permit, and implement changes to the electric grid. Therefore, the Commission has a time-sensitive duty to require meaningful analyses and data regarding possible alternatives to the utilities' proposed plans, and further, it has a time-sensitive duty to require that those alternatives be implemented if they prove to be in the public's interest, as so many other commissions have concluded.

Section 1, below, recaps the standards governing 10-year site reviews, while Section 2 shows how, in the absence of robust alternatives analyses, the proposed plans are departing from these standards, and the Commission needs to correct course. With these comments, Sierra Club respectfully urges the Commission to take the critical first step of collecting from the utilities the

missing alternatives analyses, starting with the plans that are due in April 2016. Only with this information in hand will the Commission—and the public—be able to conduct the oversight that is required and essential to serve the interest of Florida's electric consumers.

I. The Commission is expressly required by Florida law to review possible alternatives to the utilities' proposed plans, and this necessarily requires that the utilities provide the information needed to conduct the mandatory alternatives analysis, particularly with respect to renewable energy and energy efficiency.

As Florida's electric utility regulators, the Commissioners have the primary responsibility to oversee long-term planning by the state's electric utilities.[2] This starts with collecting information during the 10-year site plan review.[3] At least every two years, Section 186.801, F.S., requires that the state's electric utilities submit "10-year site plans" to the Commission estimating their power-generating needs and the general location of their proposed power plant sites.[4] Section 186.801, F.S., unambiguously mandates that the Commission "shall review"-- "possible alternatives to the proposed plan[s]" of the utilities.[5]

Section 186.801 also provides nine other criteria that the Commission "shall review," which inform not only Commission's review of the utilities' own preferred proposals, but the alternatives that the Commission must consider. Fully one third of the nine criteria require the Commission to consider ways to advance renewable energy resource additions to the grid:

> (a) The need, including the need as determined by the commission, for electrical power in the area to be served.
>
> (b) The effect on fuel diversity within the state.
>
> (c) The anticipated environmental impact of each proposed electrical power plant site.
>
> (d) Possible alternatives to the proposed plan.
>
> (e) The views of appropriate local, state, and federal agencies, including the views of the appropriate water management district as to the availability of water and its recommendation as to the use by the proposed plant of salt water or fresh water for cooling purposes.
>
> (f) The extent to which the plan is consistent with the state comprehensive plan.

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[2] *See e.g.*, Rule 25-22.072, F.A.C., incorporating by reference Form PSC/RAD 43-E (11/97), 1 (discussing Commission's oversight responsibilities) [hereinafter "Form"].

[3] *Id.*

[4] *See* Section 186.801(1), F.S.

[5] Section 186.801(2), F.S.

> (g) The plan with respect to the information of the state on energy availability and consumption.
>
> (h) The amount of renewable energy resources the utility produces or purchases.
>
> (i) The amount of renewable energy resources the utility plans to produce or purchase over the 10-year planning horizon and the means by which the production or purchases will be achieved.
>
> (j) A statement describing how the production and purchase of renewable energy resources impact the utility's present and future capacity and energy needs.[6]

Criteria (h) requires that the Commission review the "amount of renewable energy resources" utilities currently produce or purchase; (i) requires the Commission to consider the "amount of renewable energy resources" the utilities propose to produce or purchase, and the means, and; (j) requires the Commission to consider future energy and capacity needs.

If the Commission is to fulfill its duty to review not only the utilities' preferred plans but alternatives as well and, moreover, to fulfill its duty to specifically review renewable energy resources, the Commission necessarily must be provided information about those renewable energy resources, both as proposed by each utility and as potential alternative scenarios. Failure to do so reduces the Commissions' review to a make-work exercise. The Commission—and the public—need meaningful data on renewable energy resources and conventional energy resources to critically analyze the utilities' proposals. Otherwise the Commission—and the public—lack the information necessary to perform an informed assessment of the plans that the utilities' are proposing to implement.

This is only reinforced—and expanded to include energy efficiency—by criterion (f), which requires the Commission to review each plan for consistency with the state comprehensive plan, Florida's "direction-setting document,"[7] which sets out energy goal and policies that all aim to advance energy efficiency and renewable energy resources. The plan's section on energy states:

> Goal.—Florida shall reduce its energy requirements through enhanced conservation and efficiency measures in all end-use sectors and shall reduce atmospheric carbon dioxide by promoting an increased use of renewable energy resources and low-carbon-emitting electric power plants.
>
> (b) Policies.—

[6] Section 186.801 (2)(e), F.S. (emphasis added).

[7] Section 187.101, F.S.; *see also id.* ("The State Comprehensive Plan shall provide long-range policy guidance for the orderly social, economic, and physical growth of the state.")

1. Continue to reduce per capita energy consumption.

2. Encourage and provide incentives for consumer and producer energy conservation and establish acceptable energy performance standards for buildings and energy consuming items.

3. Improve the efficiency of traffic flow on existing roads.

4. Ensure energy efficiency in transportation design and planning and increase the availability of more efficient modes of transportation.

5. Reduce the need for new power plants by encouraging end-use efficiency, reducing peak demand, and using cost-effective alternatives.

6. Increase the efficient use of energy in design and operation of buildings, public utility systems, and other infrastructure and related equipment.

7. Promote the development and application of solar energy technologies and passive solar design techniques.

8. Provide information on energy conservation through active media campaigns.

9. Promote the use and development of renewable energy resources and low-carbon-emitting electric power plants.

10. Develop and maintain energy preparedness plans that will be both practical and effective under circumstances of disrupted energy supplies or unexpected price surges.[8]

The Commission's own guidance likewise requires the utilities to provide alternatives and supporting information.[9] Per the guidance, the utilities' annual plan submittals should include planning assumptions, methodologies, and outcomes. The submittals also should show that the supply of electricity contemplated in each plan is the "lowest cost possible."[10] This showing cannot be made without sufficient information about the possible alternatives to each proposed plan to allow the Commission—and the public—to verify that this critical criterion has been met.[11]

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[8] *See* Section 187.201(11), F.S. Note, subpart (11)(b)(10) raises price and supply risks that are commonly associated with out-of-state fuel imports (coal, gas, nuclear), and for which energy efficiency, solar, or other renewable technologies are solutions.

[9] See generally Form, supra n. 2.

[10] Form at 4.

[11] *See* Sierra Club comments of Oct. 16, 2013, at 5-6 (discussing need to consider cost over the life of the investment, and to quantify the risks that could materially affect the cost, including factors that are routinely considered during IRPs, such as fuel price surges and regulatory risks) *available at* http://goo.gl/h9RHeT.

Moreover, because investments in conventional generation resources—particularly coal, natural gas, and nuclear resources—require outlays of significant amounts of Floridians' money with payback periods that can span decades, for resources with very long book lives, the lowest cost showing should account for not only the current requirements and constraints, but also a range of those likely to exist five, ten, and twenty years (or more) into the future, even if this has not been the utilities' practice. These are the "future conditions" referred to above and throughout this letter.

If the utilities fail to meet these information requirements, the Commission should find the plans unsuitable and exercise its broad powers to collect the information from the utilities.[12] The Commission should "suggest alternatives"[13] to the plans to assure that they can be classified as "suitable," consistent with the statutory directive for adding clean energy to Florida's electric grid in a coordinated, cost-effective manner.[14] Ultimately, if a utility refuses to provide information on the possible alternatives and future conditions, or refuses to adopt the Commission's suggested alternatives, the Commission can classify its plan as "unsuitable." Even if the plans may not be considered binding, such a classification can carry great weight, warning the utility that the Commission may reject its proposals in subsequent dockets until the plan's shortcomings are fixed.

II. Absent robust alternatives analysis, 10-year site plans have and will continue to undercut the Commission's ability to conduct its review consistent with the mandatory statutory criteria and the corresponding directive to oversee coordinated, cost-effective renewable energy and energy efficiency resource additions to Florida's electric grid.

As Sierra Club commented at the most recent 10-year site plan workshop, the missing information on alternatives undercuts the Commission's ability to fulfill its mandatory electric utility oversight. Information on alternatives is most meaningful when coupled with information on future conditions, as noted above. However, in past 10-year site plan submittals, this information is missing, and the most acute information gaps are as follows:

- **Retire-or-retrofit analyses for Florida's coal generation.** Due to upcoming environmental compliance deadlines and multi-billion dollar retrofits contemplated in the utilities' own incomplete compliance plans, this is particularly urgent.

- **Alternatives to the approximately 11 gigawatts ("GW") of planned natural gas generation additions.** This is urgent because of Florida's existing, financially risky over-reliance on natural gas and the utilities' failure to use, or discuss how they used, a high case for natural gas prices and other future conditions to identify their preferred generation and to eliminate alternatives.

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[12] *See* Section 366.04(2)(f), F.S. (Commission "shall have the power"—"[t]o prescribe and require the filing of periodic reports and other data as may be reasonably available and as necessary to exercise its jurisdiction").
[13] Section 186.801 (1), F.S.
[14] *See* Section 187.201(11), F.S.; *see also* Section 366.04, F.S. (directing Commission to oversee "planning, development, and maintenance of a coordinated electric power grid throughout Florida to assure an adequate and reliable source of energy for operational and emergency purposes in Florida and the avoidance of further uneconomic duplication of generation, transmission, and distribution facilities." [emphasis added]).

- **Detailed information on renewable energy and energy efficiency resources, including the results of competitive solar and wind procurements and the modeling assumptions used to assess alternatives that would allow for faster grid integration of these resources.** This is urgent because these zero-fuel cost resources offer a great value relative to fuel imports, and delay will needlessly expose Floridians to higher priced power while robbing them of clean energy's wide-ranging benefits.

A. The Commission should require the utilities to submit retire-or-retrofit analyses for Florida's coal generation to prepare for fast-approaching regulatory compliance deadlines, and to assess whether retirements are more prudent than the multi-billion dollar retrofits contemplated by the utilities.

The alternatives of retrofitting or retiring coal plants are hardly discussed in the 10-year site plans. Most plans simply defer the development or disclosure of this information. The same is true for the utilities' responses to Staff Data Requests regarding their plans. The responses even fail to identify the U.S. Environmental Protection Agency ("EPA") rules that will apply to coal plants over the planning horizon: the Greenhouse Gas Rules; the Coal Combustion Residuals Rule; the Cooling Water Intake Structure Rule; the Cross-State Air Pollution Rule and Successor Cross-State Air Pollution Rule; the Effluent Limitation Guidelines; the Mercury and Air Toxics Standard; the Regional Haze Rule; and the Startup, Shutdown, and Malfunction Rule. However, based on their incomplete regulatory compliance analyses, the utilities estimate that over the next decade coal retrofits may cost billions of dollars, as shown in Table 1 below.

Table 1, Preliminary Regulatory Compliance Cost Estimates for Coal Generation ($ Millions)[15]

Utility	Low MATS	High MATS	Low CSAPR	High CSAPR	Low CWIS	High CWIS	Low CCR	High CCR	Low Total	High Total
FPL	N/A	N/A	N/A	N/A	86.31	1068.31	N/A	N/A	225.81	1607.81
DEF*	157	165	0	0	26.6	301.6	N/A	N/A	183.6	465.88
TECO	3.9	3.9	0	0	800	800	18	18	821.9	821.9
GPC	565				35	38.1	N/A	N/A	681	684
FMPA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GRU	1.5	1.5	175	175	N/A	N/A	N/A	N/A	176.5	176.5
JEA	N/A	N/A	0	0	5	30	25	25	30	55
LE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OUC	2	2	N/A**	N/A	N/A	N/A	17.2	17.2	19.2	19.2
SEC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	600	600
TAL	N/A	N/A	<.01	<.01	N/A	N/A	N/A	N/A	<.01	<.01
Total	164.4-729.4	172.4-737.4	175.01-740	175.01-740	952.91	2238.01	60.2	60.2	**2738.01**	**4430.29**

[15] This table reflects 2015 TYSP First Supplemental Staff Data Request No. 38. (*) Duke reported capital costs only. (**) OUC notes $11 million in stranded costs associated with selective catalytic reduction, which has been postponed following the vacatur of CSAPR.

In addition, the utilities' estimates provide an incomplete picture because they do not distinguish between one-time capital expenditures and the increases to recurring operating costs and others costs associated with reduced power output and generation. This omission is illustrated in TECO's response to Staff Data Request no. 36 regarding the cost of retrofitting the coal-burning Big Bend Generating Station (including four coal-burning electric generating units) with cooling towers:

> Tampa Electric is currently finalizing its compliance strategy for the CWIS Rule and is working with the regulating authority to determine scheduling for biological, financial, and technical study elements necessary to comply with the rule. These elements will ultimately be used by the regulating authority to determine the necessity of cooling water system retrofits for Big Bend and Bayside Power Stations. Based on the final rule, requirements could include retrofitting closed cycle cooling towers at regulated facilities. Few utilities, including Tampa Electric, would be in a position, either financially or due to space (land) limitations, to implement this option. As an alternative, the regulating authority may allow for modifications of existing intake structures and circulating water equipment to reduce measured impacts. <u>If required to install closed cycle cooling at Big Bend and Bayside, the cost could run as high as one-half billion dollars per facility. Tampa Electric has not conducted a formal cost study on intake and circulator modifications. However, such modifications could easily total as much as one hundred million dollars per station</u>.[16]

The information gap regarding coal generation in all of the 10-year site plans is significant and needs to be filled: There are over 9 GW of coal generation in Florida, which are growing increasingly uneconomic for reasons that are not limited to the potential need for multi-billion dollar retrofits. This coal generation is also: (1) growing older, with several coal electric generating units well past their book lives (e.g., Crist Units 4 and 5, already 56 and 58 years old, respectively); (2) growing less efficient notwithstanding the Commission's incentive program for improving heat rates (e.g., Indiantown, with an average heat rate consistently over 13,000 Btu/kWh in 2011-2014); and (3) already more expensive relative to clean energy alternatives, as evidenced by the Orlando Utilities Commission's recent resource procurement returning solar power for 7 cents/kWh—less than energy from existing coal <u>and</u> natural gas generation (8 cents/kWh), and exerting downward pressure on rates (10 cents/kWh).[17]

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[16] TECO letter of May 15, 2015, Supplemental Data Request, Request No. 36, at 46.

[17] *See* Herman K. Trabish, Utility DIVE, *'Tipping point' for FL solar? Orlando utility buys at under fossil generation prices* (Aug. 2015) *available at* http://goo.gl/NiXNLh.

Therefore, Sierra Club respectfully urges the Commission to collect the missing information on the alternatives of retrofitting versus retiring Florida's coal generation so that the Commission can conduct its mandatory review of such alternatives. Giving the utilities a pass to provide this information piecemeal in the environmental cost recovery dockets is unlawful and unwise. Without a comprehensive look at Florida's coal generation, the Commission may soon find itself in a position where it has little choice but to approve exorbitant retrofits because there has not been sufficient planning and coordination to rapidly retire multiple coal plants while maintaining adequate reliability, even though the latter would be the least cost option.

B. The Commission should direct the utilities to submit robust alternatives analyses for the approximately 11 GW of planned natural gas generation additions, and should specifically require the analyses to account for a high case for natural gas prices, which the utilities' proposed plans have not done to date.

Despite the Commission's strategic concern about Florida's over-reliance on out-of-state natural gas imports, the utilities' plans overwhelmingly favor natural gas generation additions; approximately 11,548 MW are proposed in the 2015 10-year site plans. Yet the plans hardly discuss the possible alternatives, as illustrated by TECO's statement:

> Early in the study process, many alternatives were screened on a qualitative and quantitative basis to determine the options that were the most feasible overall. Those alternatives that failed to meet the qualitative and quantitative considerations were eliminated. This phase of the study resulted in a set of feasible alternatives that were considered in more detailed economic analyses.[18]
>
> ...
>
> Tampa Electric Company continually analyzes renewable energy and distributed generation alternatives with the objective to integrate them into its resource portfolio.[19]

The problem with these statements, without more, is that they bar the Commission—or the public—from evaluating the possible alternatives to TECO's proposed plan.

At a minimum, the Commission needs each utility to provide enough information about the alternatives considered and the screening criteria used to allow the Commission—and other stakeholders—to independently review the utilities' conclusions that those alternatives should not be pursued.

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[18] 2015 TECO TYSP, at 61 *available at* http://goo.gl/wDSd2X.
[19] *Id.* at 54 (notes to Schedule 8.1).

Additionally, to aid its review, the Commission needs more information on future conditions. A robust long-term planning analysis is needed because the book life of many investments that will be made over the next ten years will extend out well beyond those ten years, and even beyond 2050. Therefore, it is important for the Commission to develop some understanding of whether the proposed investments—or the possible alternatives—are the most compatible with future conditions and the Commission's statutory directive to spur coordinated, cost-effective clean energy additions to Florida's electric grid. To be sure, Sierra Club understands that confidence around the accuracy of modeled outcomes decreases as timeframes extend further into the future. Yet there is no uncertainty about the multi-decadal book lives and payback periods associated with many electric utility investments. If the Commission is to fulfill its duty to oversee electric utility planning, the 10-year site plan review process should incorporate and be informed by future conditions within and beyond the next ten years.

With these future conditions in mind, the proposed long-lived combined cycle natural gas plants and supporting infrastructure are clearly in tension with the state's goal of optimizing its investment in clean energy alternatives for any number of reasons, including the following:

- The proposed investments in natural gas-based resources dwarf those proposed for clean energy resources.

- Doubling down on Florida's reliance on out-of-state natural gas imports would limit the available funds for clean energy alternatives, such as renewable solar and wind energy, energy efficiency, and rapidly emerging and transformative technologies, such as storage—for decades.

- Doubling down on Florida's reliance on out-of-state natural gas imports would heighten Florida electric utility customers' exposure to expensive hedging measures in the short-term, and to even greater fuel price volatility in the long-term.

- Florida's heavy reliance on natural gas may prove to be incompatible with achieving compliance with existing and anticipated public health, safety, and environmental rules, and may leave electric utility customers on the hook for replacing some of these resources before the end of their book lives (i.e., stranded assets).

Sierra Club is particularly concerned by the utilities failure to use, or discuss how they used, a high case for natural gas prices in their plans. For example, in response to Staff Data Requests, Duke Energy Florida ("Duke") states: "DUKE ENERGY FLORIDA DID NOT DEVELOP OR UTILIZE HIGH CASE - NATURAL GAS PRICES."[20] Duke's use of all capitals in the original is apt; it is extraordinary for a utility as big and sophisticated as Duke to omit a high case for natural

[20] DEF letter of May 15, 2015, Supplemental Data Request, Appendix A.

gas prices from its planning.[21] However, Duke is not alone. Even the Florida utilities that developed such a case do not fully explain how that factored in their proposed plans or development of possible alternatives.

To fill this critical information gap, the Commission should require the utilities, starting with April 2016 submittals, to provide their high case for natural gas prices, and provide a detailed explanation of how that case and other future conditions are used to develop the proposed plans and the possible alternatives. After collecting this information, the Commission may very well find that clean energy alternatives such as energy efficiency, solar, wind, and even storage are a better deal than the planned natural gas resources. Indeed, the U.S. Energy Information Administration (EIA) concluded earlier this year: "Rising long-term natural gas prices, the high capital costs of new coal and nuclear generation capacity, state-level policies, and cost reductions for renewable generation in a market characterized by relatively slow electricity demand growth favor increased use of renewables."[22] The EIA's underlying study "focus[es] on the factors expected to shape U.S. energy markets through 2040."[23] This is exactly the long view that should inform the Commission's 10-year site plan review because the utilities are proposing to spend significant amounts of Floridians' money on resources with long book lives and multi-decadal payback periods.

C. The Commission should require the utilities to submit detailed information on the available renewable energy and energy efficiency resources, including the results of competitive solar and wind power procurements and the modeling assumptions used to identify and evaluate alternatives that would integrate these resources into the grid at faster speeds.

a. Disclosing the results of competitive solar and wind power procurements.

The 2015 plans include Florida's first-ever wind power purchase agreement (Gulf Power's 178 MW PPA) and more than 1 GW of proposed solar capacity additions, "the largest amount ever included" in the 10-year site plans.[24] This is a good start but it hardly comports with the mandatory information requirements for such plans or the statutory directive to optimize clean energy additions to the grid. As noted above, the utilities consistently fail to disclose information about the possible clean energy alternatives that they have eliminated for one reason or another from their proposed plans. A passage from Duke's plan underscores this fact:

> DEF continues to seek out renewable suppliers that can provide reliable capacity and energy at economic rates. DEF continues to keep an open Request for Renewables (RFR) soliciting proposals for

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[21] In response to Staff Data Requests, Duke provides some high-level description of the natural gas price forecast that it uses in its resource planning, but not nearly enough information to allow the Commission to evaluate the proposed plan or the possible alternatives that Duke considered. *See id.* at 29 (Response. No. 48).
[22] EIA, Annual Energy Outlook 2015 (Apr. 2015), at ES-1, *available at* http://goo.gl/92uyCB.
[23] *Id.*
[24] 2015 TYSP Review, at 3, *available at* http://goo.gl/HsIfeh.

> renewable energy projects. DEF's open RFR continues to receive interest and to date has logged over 400 responses.[25]

The 400 responses to Duke's renewable procurement are impressive, and they demonstrate that there is a robust and competitive renewable energy market. Yet the Commission can do little with Duke's statement because Duke did not enclose the responses or otherwise provide enough details about them for the Commission—and the public—to conduct their own review. Unfortunately, the same is true for the other utilities' plans.

As noted above, Commission oversight is urgently needed with respect to renewable energy and energy efficiency because of the Commission's statutory directive to advance these resources and market conditions that favor doing so as well. More specifically, zero-fuel cost resources such as energy efficiency, solar, wind and even energy storage offer a great value relative to out-of-state fuel imports (coal, natural gas, and nuclear), as discussed below, and delaying the integration of these clean energy alternatives will needlessly expose Floridians to higher priced power while robbing them of clean energy's wide-ranging benefits.[26] Indeed, there is evidence of the utilities, particularly the investor owned utilities, not optimizing their clean energy additions to Florida's grid. Perhaps most notably, Florida's municipal utilities are adding solar PV at more than five times the speed (kWh per customer) than the investor owned utilities,[27] while the latter are rapidly adding solar and wind to the grid outside Florida, showing that they too can be develop these resources cost-effectively at faster speeds.[28]

Therefore, Sierra Club respectfully urges the Commission to require all utilities to provide detailed information on, if not the actual results of, their competitive solar and wind procurements by next April's 10-year site plan deadline. Additionally, Sierra Club urges the Commission to collect more information from the utilities on their modeling inputs and outputs to verify that the utilities' are, in fact, rigorously identifying all possible clean energy alternatives (including self-builds and purchases), as detailed below.

b. Modeling realistic trajectories of improving performance and declining cost of clean energy alternatives.

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[25] 2015 DEF TYSP, 3-20, available at http://goo.gl/pC8Tbv.

[26] For a discussion of the wide-ranging benefits of energy efficiency see, for example, Sierra Club post-hearing brief of Sept. 30, 2014, *available at* http://goo.gl/6O3Obh; for the benefits of solar, wind, and energy storage, see, for example, Sierra Club comments of Sept. 9, 2015, and Sept. 25, 2015, *available at* http://goo.gl/yVBbAO.

[27] The Florida Municipal Energy Association reports that Florida's municipal utilities will install 135.7 MW AC of solar by mid-2016. Further, on a per customer basis, the municipal utilities currently have 136 kWh of PV—more than 5 times more PV than Florida's investor owned utilities; they collectively have 25.8 kWh.

[28] *See, e.g.*, UBS, *NextEra Energy, Still the Industry Leader* (Sept. 2015), at 3 ("While PTCs could yet add 500MW/yr to its baseline of 300-500MW/yr baseline without the PTCs, [NextEra] mgmt. suggests it could eventually scale the business to 1.5GW-2.0GW/yr as Carbon CPP targets become a reality (mostly wind, but some solar)") *available at* https://goo.gl/96By1E; *see also* Toni Nelson, Southern Alliance for Clean Energy, *Duke, Southern, and NextEra Go Big on Wind and Solar – Just Not in the Southeast* (Nov. 2015) (citing multi-billion dollar investments in out-of-state solar and wind resources by Duke, NextEra, and Southern Company) *available at* http://goo.gl/QL0BBS.

Given the dramatic improvements in the performance of renewable technologies and the declines in levelized cost,[29] it would be easy to underestimate the performance and overestimate the cost of renewable technologies when attempting to look out ten years or more. Trends in unsubsidized levelized costs for both wind and solar are truly dramatic: Lazard's recently released unsubsidized levelized cost of energy comparison identifies the levelized cost of onshore wind at $32-77/MWh.[30] Thin film utility scale solar is $50-60/MWh.[31] These unsubsidized ranges compare very favorably with the cost of natural gas combined cycle at $52-78/MWh.[32] Moreover, in the past six years, Lazard documents a 61% decrease in the levelized cost of wind and an 82% decrease in the levelized cost of solar photovoltaics.[33] While these trends are not strictly linear, Lazard's analysis shows that the low-end levelized cost for both wind and solar has uniformly declined year-on-year for the past six years, driven by "material declines in the pricing of system components (e.g., panels, inverters, racking, turbines, etc.), and dramatic improvements in efficiency, among other factors."[34]

As these trends are expected to continue into the future, it is important that the utilities' modeling not freeze cost and performance figures at 2015 levels for the next ten years, but instead project forward realistic trajectories of improving performance and declining cost consistent with the history of the technologies and best analysis of future performance.

c. Disclosing screening criteria and other modeling assumptions regarding clean energy alternatives.

The qualitative and quantitative screening criteria and other modeling assumptions used to eliminate clean energy alternatives from the utilities' proposed plans require Commission oversight. Sierra Club respectfully urges the Commission to take the critical first step of requiring disclosure and, as appropriate, adjusting these criteria and assumptions to ensure that the utilities develop proposed plans and possible alternatives that value clean energy fairly relative to conventional power plants.

Other IRPs in the region can be instructive in this regard. For example, in advance of its IRP next year, the Georgia Commission is working with stakeholders and the regulated utility in that state through public comments and a workshop on appropriate modeling assumptions and methodologies for valuing renewables technologies.[35]

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[29] For further information on the merits of levelized cost comparisons see, for example, Sierra Club comments of Oct. 16, 2013, at 3-4 (citing literature on IRP best practices) *available at* http://goo.gl/h9RHeT, and Sierra Club post-hearing brief of Sept. 30, 2014, at 9 (identifying institutions that develop levelized cost comparisons) *available at* http://goo.gl/6O3Obh.

[30] Lazard, Levelized Cost of Energy Analysis—Version 9.0 (Nov. 2015), 9, *available at* https://goo.gl/z0xFJw [hereinafter "2015 Lazard"].

[31] *Id.* at 5.

[32] *Id.* at 2.

[33] *Id.*.

[34] *Id.* at 10.

[35] *See* Georgia Public Service Commission, Docket No: 39732, *available at* http://goo.gl/nX3USx.

The IRP concluded by the Tennessee Valley Authority[36] in August 2015 is also instructive because it is an extremely recent, comprehensive planning effort concerning a region and generation portfolio similar to that of Florida: TVA modeled multiple different resource strategies against a series of different scenarios (such as a high-growth future, a low-growth future, and a future heavily reliant on distributed generation). TVA elected to model several strategies that emphasized renewables, and a strategy that emphasized energy efficiency. What TVA found in its modeling was that strategies that emphasized renewables and energy efficiency saw marked reductions in water use[37] and in carbon emissions, among other environmental benefits, at essentially similar overall cost to more fossil fuel-oriented strategies. What is notable is that this was against a background in which all modeled strategies involved significant shifts away from carbon-intensive generation: TVA's overall analysis showed that, no matter the scenario examined, the most economically prudent thing for the utility to do would be to decrease coal-burning in favor of lower-carbon sources of electricity, such as solar, wind, and energy efficiency.

As for Florida-specific considerations regarding clean energy resources, because the Commission has received extensive comments on the improvements in the performance and cost of solar generation, and on the terrific value of energy efficiency, Sierra Club will not repeat this information here, except to provide a very brief summary. However, there are other clean energy technologies that (also) require more attention in the utilities' plans that we will highlight.

i. Energy Efficiency

Notwithstanding the weak energy savings goals set in the FEECA docket, the utilities should continue to evaluate the alternatives to their proposed plans that rapidly ramp up energy efficiency. This is particularly important because energy efficiency continues to be a very low cost, low-risk resource that compares very favorably to natural gas combined cycle as shown, for example, in Lakeland Electric 2015 Strategy Resource Plan[38] and Lazard's levelized cost comparison.[39]

Additionally, Florida continues experiencing slowing demand and excess capacity. Total national generation is about the same today as it was in 2005 even though population and the economy have grown. Florida is consistent with these national trends despite some pockets of growth. In this low growth environment, utility planners are increasingly finding that the most needed generation sources in their portfolio are not baseload or shoulder generators that have long,

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[36] More information on TVA's IRP is available at https://goo.gl/Bk7p1u.

[37] Water use is one of the mandatory criterion of this Commission's 10-year site plan review pursuant to Section 186.801(2)(e), F.S.

[38] Lakeland Electric found that energy efficiency, solar power, and other clean energy alternatives will meet its load growth over the next 20 years more cost-effectively than all three fossil fuel expansion scenarios studied. *See* nFront Consulting LLC, "Strategic Resource Plan, Lakeland Electric," at 3-13, 3-24 (Mar. 2015), *available at* http://goo.gl/B2BmRK.

[39] *See* 2015 Lazard, at 2 (showing energy efficiency remains the lowest cost resource, at $0-50/ MWh in unsubsidized levelized cost of energy comparison).

slow response times, but resources that can be quickly added to the system, such as energy efficiency.

ii. Solar

Florida has vast solar potential that is already being developed cost-effectively, albeit slowly, with wide-ranging benefits, including, not limited to cost savings, water savings, fuel diversity, fuel price hedging, increased local economic growth, and increased reliability.[40] In fact, Florida is the least expensive market to invest in solar PV according to the U.S. Department of Energy,[41] with pricing as low as $0.7 per kWh.[42] This underscores the need for Commission oversight to ensure that all utilities are pursuing optimal levels of solar generation additions.

iii. Wind

Taller wind turbines with longer blades are already projected to enable capacity factors in excess of 60% for land-based wind in the near future: With 140 meter hub heights, the National Renewable Energy Laboratory estimates nearly 2 million square kilometers in the contiguous United States that would support capacity factors of over 60%.[43] As the map in Figure 1 below shows,[44] Florida's wind generation potential has dramatically increased as a result of these technological advancements. This underscores the need to not only incorporate recent technological advances into the utilities' plans, but also for their modeling to assume some trajectory for future improvements in performance and reductions in levelized cost for wind and solar--for both in-state generation and imports.

Indeed, Florida has access to some of the lowest cost wind resources in the country, from the Mid-West, as evidenced by Gulf Power's 178 MW wind purchase from Oklahoma—with pricing below its avoided cost.[45] A high voltage direct current ("HVDC") transmission line (Plains & Eastern Clean Line) is projected to come online by 2019 to deliver approximately 3,500 MW of additional high capacity factor, low cost wind generation to the Southeast, including Florida.[46]

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[40] *See, e.g.*, Solar Energy Industries Association--Vote Solar et al. comments of June 2015, *available at* http://goo.gl/sQOEWa; Southern Alliance for Clean Energy comments of June 2015, *available at* http://goo.gl/IJUHeu.

[41] *See* DOE, *Photovoltaic System Pricing Trends: Historical, Recent, and Near-Term Projections*, 2014 Edition (Sept. 2014), at 11 *available at* http://goo.gl/W1dJ8z.

[42] *See* Herman K. Trabish, Utility DIVE, *'Tipping point' for FL solar? Orlando utility buys at under fossil generation prices* (Aug. 2015) *available at* http://goo.gl/NiXNLh.

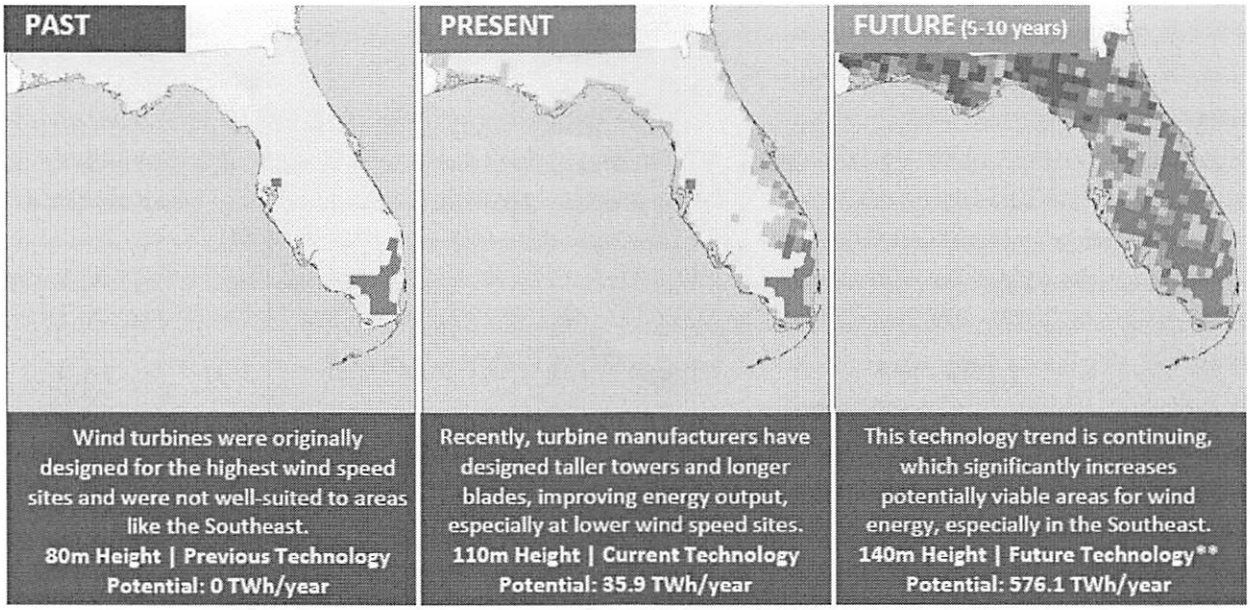
[43] NREL, United States (48 Contiguous States) – Potential Wind Capacity; Cumulative Area vs. Gross Capacity Factor, *available at* http://goo.gl/KesbYK.

[44] The map in Figure 1 is adopted from the "Florida Wind Energy Fact Sheet" prepared by The Southeastern Wind Coalition and The Southeast Wind Energy Resource Center using data from the Lawrence Berkeley National Lab, U.S. Energy Information Administration, and American Wind Energy Association. Maps estimate areas where wind energy could be economically viable (estimated gross capacity factor greater than 35%) when using available turbine technology. Not all areas shown can be developed. (**) 150 W/m2 machine. The Fact Sheet is available at http://goo.gl/TlGgQJ.

[45] *See, e.g.*, Sierra Club and Southern Alliance for Clean Energy letter of May 1, 2015 (discussing benefits of wind power purchases for Florida's electric customers) *available at* http://goo.gl/MYSsxw.

[46] Additional information on the Clean Line is available at http://www.cleanlineenergy.com/.

Figure 1, Florida Wind Energy Resource Potential



iv. Energy Storage

Similarly, 10-year site plans should address rapidly emerging and transformative renewable energy technologies, such as energy storage. Used appropriately, energy storage can increase grid efficiency, reduce the delivered cost of energy and ancillary services, increase reliability, and reduce infrastructure requirements. Compared to traditional generation or transmission resources, energy storage is typically highly accommodating with regard to sizing, siting, and permitting, so it can be located closer to load, or closer to grid congestion points, than other options. Recent energy storage procurement has shown that costs are lower than anticipated, and energy technology costs continue to fall as production and integration of resources increases.[47]

III. Conclusion

For all the foregoing reasons, the Commission has a time-sensitive duty to collect from the state's electric utilities information on the possible alternatives to their preferred generation plans, including supporting information that will allow the Commission—and the public—to critically evaluate those plans. Further, the Commission has a time-sensitive duty to require that renewable energy and energy efficiency alternatives be implemented if they prove to be in the public's interest, as so many other commissions have concluded. So that the Commission may fulfill these critical oversight duties, the Sierra Club respectfully requests that in advance of next April's 10-year site plan deadline, the Commission take the critical first step of requiring the utilities to submit the missing information regarding alternatives.

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[47] Aachen University, Battery Storage for Grid Stabilization (October 2014), *available at* http://www.iea.org/media/workshops/2014/egrdenergystorage/Leuthold.pdf.

Thank you for your consideration.

Respectfully submitted,

/s/
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