

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition to determine need for Seminole combined cycle facility, by Seminole Electric Cooperative, Inc.	DOCKET NO. 20170266-EC
In re: Joint Petition to determine need for the Shady Hills combined cycle facility, by Seminole Electric Cooperative, Inc. and Shady Hills Energy Center, LLC.	DOCKET NO. 20170267-EC DATED: APRIL 4, 2018

**POST-HEARING STATEMENT OF ISSUES AND POSITIONS AND INCORPORATED BRIEF OF PETITIONERS, SEMINOLE ELECTRIC COOPERATIVE, INC., AND SHADY HILLS ENERGY CENTER, LLC.**

Petitioners, Seminole Electric Cooperative, Inc., (“Seminole”) and Shady Hills Energy Center, LLC (“SHEC”) (collectively, “Petitioners’), pursuant to the requirements of the Order Establishing Procedure (Order No. PSC-2018-0018-PCO-EC) and Prehearing Order (Order No. PSC-2018-0151-PHO-EC), hereby submit this Post-Hearing Statement of Issues and Positions, and Incorporated Brief.

**EXECUTIVE SUMMARY**

The Commission should grant the petitions for determination of need for the Seminole Combined Cycle Facility (“SCCF”) and the Shady Hills Combined Cycle Facility (“SHCCF”) because the analyses presented in the testimony and exhibits of the Seminole and SHEC witnesses demonstrate that the two combined cycle facilities are needed to meet the electrical demands of Seminole and its Member Cooperatives and otherwise satisfy all of the criteria set forth in section 403.519, Florida Statutes. Seminole’s analyses demonstrate that the resource plan that includes the SHCCF coming into service in late 2021, and the SCCF coming into service in late 2022, concurrent with the removal from service of one of Seminole’s existing coal units at the Seminole Generation Station (“SGS”), is the most cost-effective alternative for meeting Seminole’s capacity needs, and will enable Seminole to maintain system reliability and fuel diversity at a reasonable cost.

Seminole is a not-for-profit rural electric cooperative that is owned by its nine Member-Cooperatives through a Board of Trustees composed of delegates of its Member-Cooperatives, who collectively serve approximately 1.6 million people and businesses in 42 of Florida's 67 counties. Seminole only makes wholesale sales to its Members; it does not make retail sales. Seminole does not earn a return on equity and it does not have an incentive to build new power plants. It exists to provide reliable and cost-effective electric service to its Members. [T.53-54; T.66-67; T.78 (Ward); Exhs.3/29, at pp.11-12 of 153].

Based on its continuing evaluation of its Members' electricity needs, Seminole projects a need for 901 MW of additional generating capacity by the end of 2021. This projected need results primarily from the expiration of power purchase agreements ("PPAs"), including the expiration of a 150 MW PPA on December 31, 2020, followed by the expiration of two more PPAs totaling 750 MW of capacity in May, 2021. Because an additional 300 MW PPA expires the following year, along with expected load growth, Seminole's projected need increases to 1,265 MW by the end of 2022. Although Seminole and its Members utilize renewable energy sources and conservation measures to the extent reasonably available, and Seminole has included a 40 MW solar photovoltaic PPA within the selected portfolio, there are no cost-effective renewable energy resources or conservation measures available to offset the need.

Seminole's Board of Trustees selected the resource plan that includes the SCCF and the SHCCF facilities to meet Seminole's capacity needs based on the results of a multi-stage resource planning process. That process included extensive economic analyses of self-build options and over 200 power purchase alternatives, including numerous renewable energy proposals, identified during a Request for Proposal ("RFP") process, as well as careful consideration of non-economic attributes and risk factors. Seminole's analyses demonstrate that the resource portfolio that includes the SCCF, along with the removal from service of one of

Seminole's existing coal units, and the tolling agreement with SHEC for the SHCCF is the most cost-effective alternative to meet Seminole's capacity needs and would result in projected net present value ("NPV") savings of approximately \$363 million as compared to the next ranked alternative resource portfolio over the study period. By maintaining the operation of one SGS coal-fired generating unit, Seminole will continue to have a diversified fuel portfolio. Moreover, Seminole is implementing a natural gas transportation plan for the new units that will enhance the diversification of Seminole's delivered gas supply. For these reasons, the SCCF and SHCCF are not only the most cost-effective options for meeting Seminole's need; they will provide adequate electricity at a reasonable cost and they also will contribute to the reliability and integrity of Seminole's power supply system.

### **STANDARD OF REVIEW**

The Commission's decision regarding an application for a determination of need is an integral part of the overall site certification process as set forth in Chapter 403, Florida Statutes. The Commission is the sole forum for a determination of need. If a need determination is granted, the process continues with reviews by the Department of Environmental Protection and other state and local agencies. Final certification requires the approval of the Governor and Cabinet presiding as the Siting Board based on their review of the total record.

In making its determination of need, Section 403.519, Florida Statutes, requires that the Commission take into account the following:

... 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....

While the need determination statute makes it clear that each of these factors must be taken into consideration, the statute does not prescribe what importance or weight should be given to each. See Order No. PSC-2010-0409-FOF-EM, issued June 28, 2010, in Docket No. 20090451-EM, In re: Joint petition to determine need for Gainesville Renewable Energy Center in Alachua County, by Gainesville Regional Utilities and Gainesville Renewable Energy Center, LLC, at p.4. Therefore, the Commission has broad authority to determine how each of these may be weighed and the discretion to determine the need for a power plant based upon one or more of the above criteria, so long as each has been considered as a component of the final decision. Id. (citations omitted).

Ultimately, the Commission’s “decision on a need determination petition must be based on the facts as they exist at the time of the filing with the underlying assumptions tested for reasonableness.” Order No. PSC-2016-0032-FOF-EI, issued on January 19, 2016, in Docket No. 20150196-EI, In re: Petition for determination of need for Okeechobee Clean Energy Center Unit 1, by Florida Power & Light Company, at p.24.

### **ISSUES AND POSITIONS<sup>1</sup>**

**Issue 1A:**     **Is there a need for the proposed Seminole Combined Cycle Facility, taking into account the need for electric system reliability and integrity, as this criterion is used in Section 403.519(3), Florida Statutes?**

**Seminole:**     \* Yes. Seminole has demonstrated a reliability need for 901 MW of additional generating capacity by the end of 2021 and 1,265 MW by the end of 2022, as well as a need for the additional capacity to be provided by the SCCF and SHCCF because it will displace higher cost coal-fired generation. \*

**Issue 1B:**     **Is there a need for the proposed Shady Hills Combined Cycle Facility, taking into account the need for electric system reliability and integrity, as this criterion is used in Section 403.519(3), Florida Statutes?**

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<sup>1</sup>For purposes of brevity, the discussion following the statement of issues and positions apply to both issues #A and #B, except were specifically indicated (with regard to Issues 3A and 3B and Issues 6A and 6B).

**Petitioners:** \* Yes. Seminole has demonstrated a reliability need for 901 MW of additional generating capacity by the end of 2021 and 1,265 MW by the end of 2022, as well as a need for the additional capacity to be provided by the SCCF and SHCCF because it will displace higher cost coal-fired generation. \*

Seminole uses standard utility industry planning practices and tools which utilize both deterministic and probabilistic approaches for planning a resource mix that satisfies a Reserve Margin criterion of 15% and achieves a Loss of Load Probability (“LOLP”) of one day in ten years. The Reserve Margin is the additional amount of capacity that a utility maintains above the forecasted peak demand. Reserves are necessary to accommodate generator outages, load forecast uncertainty, and abnormal weather. The Reserve Margin considers only the forecasted peak demand versus the amount of generation resources, but the LOLP criterion takes into account load shape, unit sizes, unit availability, and capacity mix when calculating the probability of a utility not adequately meeting load. These reliability criteria help to ensure that sufficient generation capacity is available to meet Seminole’s Members’ forecasted needs. [T.442 (Diazgranados)].

Seminole’s power supply planning process begins with the development of the peak demand and energy forecasts (“load forecasts”) for each of Seminole’s nine Members, which are aggregated into a single Seminole load forecast. Seminole adheres to a generally accepted methodology currently employed within the electric utility industry to forecast number of consumers, energy and peak demand. Each Member-Cooperative is modeled separately, since each service area exhibits unique growth and geographical characteristics. Seminole produces monthly forecasts for each Member system. If rate classification data are available, class level forecasts are developed and reconciled to match Member-total level forecasts. Model assumptions are collected from Members, government agencies, universities, and other third party providers. [T.285 (Wood); Exh.64].

The Seminole load forecast's coincident peak demands are used to determine the amount of capacity needed to meet the Members' forecasted demand plus an additional 15% to satisfy Seminole's Reserve Margin. A gap analysis is then used to identify deficiencies between forecasted requirements and current available capacity. [T.442-43 (Diazgranados)]. Seminole's current gap analysis shows that, by the end of 2021, Seminole will need 901 MW of generation to meet its Members' energy needs along with its Reserve Margin requirements. Seminole's future capacity need results primarily from the expiration of purchased power agreements ("PPA"), including expiration of a 150 MW PPA with Duke Energy Florida ("DEF") on December 31, 2020, followed by expiration of a 200 MW PPA with Florida Power & Light Company ("FPL") on May 31, 2021, and expiration of a PPA with Southern Power Company for three of its Oleander peaking units (with total capacity ratings of 550 MW winter and 460 MW summer) in May of 2021. Seminole's need will grow to 1,265 MW in 2022 due to expected load growth and the expiration of a 300 MW PPA with DEF. [T.442-43 (Diazgranados); Exhs.21, 45].

Although the Intervenors' witness, Dr. Sotkiewicz, has never actually prepared or been responsible for preparing a load forecast for an electric utility [T.610 (Sotkiewicz)], he opined, based on his analysis of historical error in Seminole's load forecasts for 2003 through 2012, that "Seminole's forecasting cannot be used as a basis for supporting the need for the combined capacity of the SCCF and SHCCF." [T.578 (Sotkiewicz)]. Dr. Sotkiewicz did not offer an alternative load forecast [T.610] or suggest any improvements to Seminole's load forecasting methodology [Exh.95 (Quantum Response to Staff Interrogatory No. 2)]. Instead, he suggested that "[t]he Commission should invite Seminole to correct its forecasting methodologies and come back to the Commission with appropriate need petitions in the future." [T.600 (Sotkiewicz)].

As explained in the rebuttal testimony of Seminole witnesses Wood and Hong, however, there are a number of problems with Dr. Sotkiewicz's error analysis, and his invitation to improve Seminole's load forecast methodology has already been accepted.<sup>2</sup> Importantly, Dr. Sotkiewicz's error analysis focused on load forecasts that *predated* significant improvements to Seminole's load forecasting models and methodology. As Seminole's Manager of Load Forecasting, Mr. Wood, explained, like other utilities, Seminole experienced consistent forecast error during the period covered by Dr. Sotkiewicz's analysis due to the magnitude of the Great Recession and the onset of federally mandated energy efficiency codes and standards. For that reason, Seminole made significant improvements to its forecasting models and methodology beginning in 2014 [T.625-26, 634, 655-57 (Wood); Exh.64]. Major improvements to Seminole's load forecasting models and methodology included: removal of outdated model variables and revising the end-use and load factor model (2014); ending the practice of forecasting usage-per consumer and transitioning to modeling and forecasting total energy requirements (2015); ending the practice of modeling and forecasting load factor in order to calculate demand (2015); acquiring weather data from 25 weather stations in Florida and Georgia, an increase from only 8 stations previously employed (2015); incorporating Itron data (based on the EIA National End-

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<sup>2</sup> Dr. Sotkiewicz's error analysis is fundamentally flawed for several reasons. First, as discussed in the text above, his analysis focuses on forecasts that predate significant improvements to Seminole's forecast methodology and, therefore, has no bearing on the accuracy of Seminole's current forecast. Second, Dr. Sotkiewicz fails to provide any historical context or comparison. As discussed in Mr. Wood's rebuttal testimony, when Dr. Sotkiewicz's approach is applied to two other Florida utilities, it yields similar error rates during the period in question, when many utilities were experiencing forecast error due to the Great Recession and onset of federal energy efficiency standards. [T.628-29; Exh.65]. Third, Dr. Sotkiewicz failed to properly account for the lag time between preparation of the load forecasts presented in Seminole's Ten Year Site Plans ("TYSPs") and the filing of the TYSPs, as well as the fact that Lee County Electric Cooperative ("LCEC") withdrew as a Seminole Member during the period in question. [T.627-28]. When Dr. Sotkiewicz's analysis is corrected to properly account for forecast origin and the withdrawal of LCEC, Seminole's historical forecast error for the period in question is reduced by almost half, from Dr. Sotkiewicz's estimate of 39% to approximately 21%. [T.629-31; Exh.66].

Use Modeling System) into energy and demand models to control for trends in building shell efficiency, end-use appliance saturation, and efficiency (2016); and developing incremental, additional behind-the-meter distributed solar generation forecasts for Members and their end-use consumers (2017). [T.655-57, 625-26 (Wood); Exh.64]. Those changes have resulted in significant reductions in Seminole's load forecast since 2013. [Exh.112].

To evaluate Seminole's current load forecast methodology, Mr. Wood performed ex post analyses of Seminole's forecasts from 2015-2017. These analyses demonstrate that Seminole is no longer consistently overestimating demand.<sup>3</sup> [T.631-32 (Wood); Exh.97 (Wood Depo. Exh.4)]. Furthermore, the Mean Absolute Percentage Error ("MAPE"), a widely-used error measure in forecasting, for the 2017 ex post analysis of Seminole's demand model ranged from 2.3% to 3.5%. [T.632 (Wood); Exh.67]. As explained by Dr. Tao Hong, a widely recognized load forecaster, these error rates are reasonably low and compare favorably to a load forecast that Dr. Hong presented in an award-winning paper to IEEE (Institute of Electrical and Electronics Engineers) Power and Energy Society's Power Systems Planning and Implementation Committee. [T.671-72 (Hong); Exhs.68, 69]. Moreover, based on his review of Seminole's current load forecasting methodology, including model assumptions, data inputs and variable selection processes, Dr. Hong opined that Seminole's load forecast is reasonable for purposes of this proceeding. [T.672-75, 677-78 (Hong)].

Aside from load-forecasting, Intervenors also claim that the SCCF and SHCCF are not needed and would cause "uneconomic duplication" because "Peninsular Florida reserve margins are projected to be entirely adequate to meet all reliability criteria through at least 2026 without either the SCCF or the SHCCF" [Order No. PSC-2018-0151-PHO-EC, at p.7 (Intervenors' Basic

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<sup>3</sup> For example, the actual winter-peak demand for 2017-18 was 3,932 MW [T.340 (Wood)], which was higher than Seminole's "high" forecast of 3,856 MW. [Exhs. 3/29, at pp.46-47].



Position)], but this argument ignores the fact that Seminole only has access to any such excess Peninsular Florida capacity through the wholesale marketplace. As further discussed below, Seminole tested the marketplace through the RFP process and ultimately developed a balanced portfolio that includes existing capacity resources located within Peninsular Florida that were determined to be cost-effective. Specifically, the selected portfolio includes a 15-year PPA for a firm system sale of peaking and intermediate sources from DEF for up to 450 MW each year through 2030 and up to 300 MW each year thereafter, with a delivery start date of June 1, 2021. [T.507 (Taylor)]. Intervenors can cite no Commission precedent for the proposition that Seminole must rely on excess Peninsular Florida capacity (assuming it would exist), in lieu of new generation resources, without regard to cost-effectiveness or other relevant considerations, such as transmission impacts.

Based on the evidence of record, Seminole has demonstrated that its load forecast is reasonable and that, when projected peak demand is considered in conjunction with the expiration of PPAs and Reserve Margin requirements, Seminole has a reliability need of 901 MW by the end of 2021 and 1,265 MW by the end of 2022. Although the combined output of the SCCF and SHCCF is larger than this projected reliability need, as further discussed below, Seminole's economic analyses demonstrate the resource plan that includes the SCCF and SHCCF, along with the removal of service of an existing 664 MW coal unit, is the most cost-effective alternative for meeting Seminole's reliability needs. In similar circumstances where utilities have demonstrated savings associated with the displacement of higher cost fuel and purchased power generation with lower cost generation, the Commission has found a need for additional capacity beyond what may be strictly required to meet reliability needs. See e.g., Order No. PSC-2018-0150-FOF-EI, issued on March 19, 2018, in Docket No. 20170225-EI, In re: Petition for determination of need for Dania Beach Clean Energy Center Unit 7, by Florida

Power & Light Company (finding need for proposed combined cycle unit based in part on “a need to retire the Lauderdale 4 and 5 Units early which results in the system reliability need to add capacity”); Order No. PSC-1997-0659-FOF-EM, issued June 9, 1997, in Docket No. 19961512-EM, In re: Petition to determine need for proposed electrical power plant in St. Marks, Wakulla County, by City of Tallahassee, at p.8 (recognizing that “[s]ystem fuel benefits from the early retirement of Purdom Units 5 and 6 outweigh the up front capital cost of full construction”); Order No. PSC-2007-0119-FOF-EI, issued February 8, 2007, in Docket No. 060642-EI, In re: Petition to determine need for expansion of Crystal River 3 nuclear power plant, for exemption from Bid Rule 25-22.082, F.A.C., and for cost recovery through fuel clause, by Progress Energy Florida, Inc., at p.3 (recognizing “economic need, not reliability need” for nuclear uprate project that was expected to displace higher cost fossil fuel and purchased power generation and thereby “result in substantial fuel savings that provide a net benefit to customers”).

**Issue 2A:**     **Are there any renewable energy sources and technologies or conservation measures taken by or reasonably available to Seminole Electric Cooperative, Inc., which might mitigate the need for the proposed Seminole Combined Cycle Facility?**

**Seminole:**     \* No. As a winter-peaking utility, Seminole experiences its highest demand when solar energy is not a viable capacity source. As such, additional renewable energy is not reasonably available to mitigate Seminole’s need. Seminole’s wholesale rate structure provides price signals that encourage Members to implement conservation measures aimed at reducing Seminole's system peak. Despite the conservation savings achieved by its Members, Seminole needs additional capacity and conservation measures are not reasonably available to mitigate that need. \*

**Issue 2B:**     **Are there any renewable energy sources and technologies or conservation measures taken by or reasonably available to Seminole Electric Cooperative, Inc. and Shady Hills Energy Center, LLC, which might mitigate the need for the proposed Shady Hills Combined Cycle Facility?**

**Petitioners:** \* No. As a winter-peaking utility, Seminole experiences its highest demand when solar energy is not a viable capacity source. As such, additional renewable energy is not reasonably available to mitigate Seminole's need. Seminole's wholesale rate structure provides price signals that encourage Members to implement conservation measures aimed at reducing Seminole's system peak. Despite the conservation savings achieved by its Members, Seminole needs additional capacity and conservation measures are not reasonably available to mitigate that need. \*

### **Renewable Energy Sources and Technologies**

Seminole's generating mix already includes reasonably available renewable resources, including biomass, landfill gas-to-energy, waste-to-energy, and solar resources. [T.56, 69 (Ward); Exhs.3/29, pp.16-17]. As part of its need evaluation process, Seminole solicited proposals for additional renewable energy resources. [T.402; Exhs.3/29, pp.140-41]. However, the results of Seminole's economic evaluations show that additional renewable energy resources, including proposals for solar, wind and battery storage, would not be cost-effective as compared to SCCF or SHCCF. [T.59, 71 (Ward); T.404 (Peters); Exhs.19, 43]. Moreover, Seminole is a winter-peaking utility that experiences its highest end-use demand on winter mornings and nights when solar energy is not a viable capacity source to offset peak demand. [T.59, 71 (Ward)]. For these reasons, additional renewable energy resources or technologies are not reasonably available to mitigate the need for either the SCCF or SHCCF. Nevertheless, in recognition of the energy value and summer capacity value of solar, Seminole has included 40 MW of solar in the selected resource plan. [T.59, 72 (Ward); T.449 (Diazgranados); T.506-07 (Taylor)]. In addition, the inclusion of short-term PPAs and more flexible gas-fired generation in the selected portfolio will enable Seminole to add renewable technologies, such as solar-with-storage, through the next decade if those technologies become cost-competitive. [T.132 (Ward); T.722 (Taylor)].

### **Conservation Measures**

As a wholesale supplier of electric energy to its Member-Cooperatives, Seminole is not directly responsible for demand side management (“DSM”) programs. However, Seminole’s wholesale rate structure provides Members price signals that reflect Seminole’s cost of supplying power in aggregate. Under this rate structure, Seminole’s demand charge to each of its Members is applied to each Member’s demand at the time of Seminole’s peak. This encourages Members to concentrate their load management efforts on controlling Seminole’s overall system peak rather than their separate peaks. In addition, Seminole’s wholesale rates to its Members include time-of-use fuel charges to reflect the differences in fuel costs incurred by Seminole to serve its Members during the peak and off-peak periods. Each Member may use these price signals to evaluate the cost-effectiveness of DSM and conservation measures for its own circumstances. To ensure Members have the opportunity to achieve maximum load-management benefit, Seminole’s system operators develop and implement a coordinated load management demand reduction strategy in real time to notify Members when Seminole’s monthly billing peak is expected to occur. [T.292 (Wood); Exhs.3/29, at p.66 of 153].

Seminole also assists its Members in evaluating and implementing DSM measures. In 2008, Seminole and its Members jointly formed an Energy Efficiency Working Group to coordinate and further-promote energy conservation and efficiency initiatives. The function of this group is to promote conservation, efficiency and DSM programs through the sharing of information, member-consumer education, and joint assessment of energy efficiency technologies. Seminole also has sponsored its own conservation/efficiency initiatives, which included giving light emitting diode light bulbs (“LEDs”) to member-consumers during Member meetings and administering an LED bulk purchase program for Members. Seminole provides Members with materials that can be distributed to end-use member-consumers including

educational brochures, manufactured housing weatherization brochures, videos on energy efficiency home auditing, and a video on Cooperative Solar. Seminole also remains active in upgrading utility system efficiency at administration and generation facilities. [T.293 (Wood); Exhs.3/29 at p.66-67 of 153].

Because Seminole and its Members are not subject to the requirements of the Florida Energy Efficiency and Conservation Act ("FEECA"), they do not have Commission-approved DSM goals, programs or plans. [T.293 (Wood)]. However, Seminole's Members participate in a variety of utility system efficiency and DSM programs, including distribution system voltage reduction, load management distributed generation and interruptible rate programs which help reduce Seminole's load during peak periods. Seminole's Members also offer a variety of programs and services to end-use member-consumers in order to promote energy conservation and cost savings. Member programs include: Distribution System Voltage Reduction; Commercial Coincident Peak Power Rates; Commercial Interruptible Rates; Commercial Customer Load Generation; Time-of-Use Rates; Residential Pre-Pay; LED/CFL Efficient Bulb Giveaway; LED Outdoor and Street Lighting; Residential Energy Smart Rebates; Energy Audits; and Utility System Energy Efficiency Projects. [T.294-95 (Wood); T.372-74 (Hines); Exhs3/29 pp.67-68 of 153].

In 2016, Seminole engaged Advanced Energy and Tierra Resource Consultants ("AE/Tierra"), an energy and natural resource consulting firm, to help quantify the energy efficiency and DSM savings achieved by Seminole and its Members. [T.296 (Wood)]. AE/Tierra estimated that Seminole and its Members are achieving 12,353 MWh in annual savings and approximately 85 MW in peak savings. [T.374 (Hines); Exhs.16/40, pp. 5-6].

In its 2016 RFP, Seminole welcomed proposals for demand side options, but did not receive any DSM proposals. [T.402; T.403; Exh.2/39, p.140 of 153]. In order to help Seminole

further evaluate whether DSM measures may be reasonably available to mitigate the projected need, Seminole also engaged AE/Tierra to identify potential new programs and to evaluate their cost-effectiveness. [T.374-76 (Hines); Exhs.17, 41]. None of the additional measures evaluated by AE/Tierra satisfied the Rate Impact Measure (“RIM”) test traditionally relied upon by the Commission in evaluating the cost-effectiveness of DSM measures. [T.375 (Hines); Exhs.17, 41]. Nevertheless, Seminole is planning to implement one of the identified measures (a Smart Thermostat pilot program) of particular interest to Members. Seminole also is committed to working with its Members to implement recommendations made by AE/Tierra to help improve program tracking and increase future savings by enhancing current efforts and adding new measures to existing programs when appropriate. [T.296-97 (Wood)].

The DSM and conservation savings actually achieved by Seminole’s Members are reflected in Seminole’s load forecast, yet Seminole will still need 901 MW of additional capacity beginning in 2021. To put this in perspective, in Order No. PSC-14-0696-FOF-EU, the Commission established DSM goals for the utilities subject to FEECA. Based on those goals, the largest electric utility in the State of Florida, FPL, is expected to achieve Commission-Approved DSM Goals of approximately 526 MW in summer demand reduction and 324 MW in winter demand reduction, over the course of a ten-year period from 2015 through 2024. As an additional point of comparison, TECO, which is comparable in size to Seminole in terms of consumers and annual peak demand, is expected to achieve Commission-approved DSM Goals of approximately 56 MW in summer demand reduction and 78 MW in winter demand reduction, over the course of the same ten-year period. Based on these Commission-approved DSM goals even large, vertically integrated utilities comparable to and larger than Seminole’s size with centralized staff and resources to offer DSM programs directly to their customers cannot cost-

effectively achieve 901 MW peak demand reductions through DSM and conservation programs over the course of the next four years. [T.297-98; Exhs. 3/29, p.70 of 153].

Even if additional DSM savings were theoretically achievable, the selected resource plan that includes the SCCF and SHCCF would still be Seminole's most cost-effective alternative based on the results of Seminole's "low load" sensitivity analysis. The low load forecast sensitivity is intended to reflect reductions in loads due to a combination of potential factors as compared to the base case, including but not limited to changes in economic conditions, decreased customer counts, mild weather, increased utilization of customer-owned distributed generation resources, and increased energy efficiency. The low load forecast sensitivity may be considered as a proxy for Seminole's Members' member-consumers achieving increased levels of demand and energy reductions due to DSM or conservation as compared to the base case load forecast. Because the selected resource plan is the most cost-effective alternative even considering the low load forecast, there is no reasonable basis to conclude that DSM or conservation measures are reasonably available to Seminole or its Members that would mitigate the need for SCCF and SHCCF. [Exhs.3/29, p.66 of 153]. Further, as explained by Seminole witness Hines, who has over 25 years of experience in DSM program design, implementation and evaluation, there is an order-of-magnitude difference between the potential amount of reasonably available DSM savings and the amount of Seminole's need. [T.394 (Hines)].

**Issue 3A:**     **Is there a need for the proposed Seminole Combined Cycle Facility, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519(3), Florida Statutes?**

**Seminole:**     \* Yes. SCCF is a highly efficient combined cycle unit, which yields lower production costs than other options. Locating SCCF at SGS provides substantial cost benefits by enabling SCCF to share existing infrastructure and transmission capacity. The results of Seminole's RFP and resource planning processes show that SCCF, together with removing a coal unit from service and SHCCF, is the

most cost-effective alternative to meet Seminole's needs, resulting in \$363 million of projected NPV savings. \*

The SCCF involves construction and operation of a new state-of-the-art natural gas-fired “two-on-one” (“2x1”) combined cycle generating facility and onsite associated facilities on an approximately 32 acre parcel adjacent to the existing SGS plant. The SCCF will consist of two combustion turbine generators (“CTG”), two heat recovery steam generators (“HRSGs”), and one steam turbine generator (“STG”). Seminole has selected the advanced, large-frame GE Model 7HA.02 CTG for the SCCF. When operated in combined cycle mode, these large CTGs create the most efficient electric generating technology currently available for utility-scale power plants. The facility is expected to have a “gross nominal” output of 1,183 MW and a “net nominal” output of 1,050 MW, the latter of which it is anticipated to achieve across the entire range of ambient conditions typically experienced in Palatka, Florida. [T.164 (Kezell); Exh.3, pp.20-23 of 153].

The SCCF will utilize existing infrastructure, including the cooling water supply and wastewater discharge pipelines to the St. Johns River and the intake and discharge structures in the river. The new electrical switchyard for the SCCF will be an extension of the existing SGS switchyard and electricity generated by the SCCF will be transmitted to the Florida transmission network through the existing 230 kV transmission lines running west from the SGS site. [Exh.3, p.19 of 153].

Seminole has significant experience with the construction and operation of combustion turbines and combined cycle facilities, having developed the 2x1 combined cycle Midulla Generating Station (“MGS”) in Hardee County in 2002 and having installed ten additional simple cycle gas turbines at MGS in 2006. [T.165 (Kezell)].



Seminole estimates the capital cost of constructing the SCCF to be approximately \$727 million, including plant structures, equipment, construction, interest during construction, and other owner's costs.<sup>4</sup> [T.172 (Kezell); Exh.3, p.30 of 153]. Although the Intervenor's witness, Dr. Sotkiewicz, questioned Seminole's cost estimates as low compared to the estimated costs of FPL's proposed Dania Beach Energy Center ("DBEC") and other estimates for generic units, Mr. Kezell explained in rebuttal that there are a number of company-specific, project-specific and site-specific factors that can adequately account for the disparity in the cost estimates for SCCF and DBEC.<sup>5</sup> [T.694-700 (Kezell)]. Likewise, the generic estimates cited by Dr. Sotkiewicz also fail to take into account locational differences that can greatly affect the costs of specific units. [T.700-02 (Kezell)].

As Mr. Kezell explained in rebuttal, Seminole's project cost estimate for the SCCF is based in large part on an executed fixed-price contract for power island equipment ("PIE") and a near-final fixed-price contract for Engineering, Procurement, and Construction ("EPC") services (within 1% of total agreed upon price). The PIE and EPC contracts, both of which were competitively bid, together will comprise approximately 80% of the SCCF's total installed cost.

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<sup>4</sup> Seminole also estimates approximately \$54 million of costs for potential network upgrades needed on FPL's and DEF's transmission systems to facilitate delivery of power from the SCCF. [T.258 (DeMelo)]. These costs were included, along with the estimated costs of the SCCF and associated gas lateral, in Seminole's economic analyses. [T.447 (Diazgranados); T.724 (Taylor)].

<sup>5</sup> For example, Dr. Sotkiewicz failed to recognize that FPL's estimate includes \$45 million more for AFUDC (allowance for funds used during construction) because FPL includes a return on equity ("ROE") in addition to interest during construction ("IDC"). Seminole's estimate only includes IDC because, as a not-for-profit cooperative, Seminole does not earn ROE. This alone accounts for 45% of the difference between the SCCF and DBEC cost estimates. [T.695-96 (Kezell)]. Other factors that contribute to the difference in cost estimates include differences in design that likely increase the cost of the DBEC, a shorter construction schedule for the DBEC which likely increases costs, higher labor costs in South Florida where DBEC will be located as compared to Palatka where the SCCF will be located, site differences between the restricted urban area where DBEC will be located and the relative undeveloped area adjacent to the SGS where SCCF will be located, as well as other project-specific factors. [T.696-700 (Kezell)].

[T.693-94 (Kezell)]. Based on the evidentiary record, there is no valid reason to question the reasonableness of Seminole's estimate.

As further discussed in regard to Issues 5A and 5B below, based on the competitive market RFP process, as well as Seminole's internal resource planning process, the selected resource plan, which includes the SHCCF coming into service in late 2021, is the most cost-effective alternative for meeting Seminole's capacity needs, resulting in projected NPV savings of approximately \$363 million as compared to the next ranked alternative portfolio over the study period. Although Seminole's wholesale rate may increase slightly immediately after the new units come into service, the record demonstrates that the selected resource plan, which includes the SCCF, will result in the lowest wholesale rates over the course of the study period. [Exh.103, p.20 (Bates Page SECI001619)].

For these reasons, the record demonstrates that the estimated costs for the SHCCF are reasonable and the SHCCF will help satisfy the need for adequate electricity at a reasonable cost.

**Issue 3B:**     **Is there a need for the proposed Shady Hills Combined Cycle Facility, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519(3), Florida Statutes?**

**Petitioners:**   \* Yes. SHCCF is a highly efficient combined cycle unit, which yields lower production costs than other options. The location of SHCCF provides substantial cost benefits by enabling SHCCF to share existing infrastructure and operational staffing. The results of Seminole's RFP and resource planning processes show that SHCCF, together with SCCF and removing a coal unit from service, is the most cost-effective alternative to meet Seminole's needs, resulting in \$363 million of projected NPV savings. \*

The new SHCCF will include a new state-of-the-art natural gas-fired 573 MW (winter), "one-on-one" ("1x1") combined cycle generating unit and onsite associated facilities. The SHCCF will consist of one CTG, one HRSG, and one STG. The CTG will be the advanced, large-frame GE Model 7HA.02. The SHCCF will be designed, constructed, owned and operated

by SHEC on a portion of the existing Shady Hills power plant site located in Shady Hills, Florida, approximately 30 miles north of Tampa, Florida. [T.23-24 (Mathur); Exh.29, p.31 of 153].

Locating the SHCCF at the Shady Hills site enables the project to take advantage of nearby access to existing utility infrastructure, including a high-pressure gas transmission line via an existing gas lateral which was originally sized in anticipation of an expansion, a nearby high voltage electric transmission line, and reclaimed water from Pasco County's reuse water system, including the adjacent Shady Hills wastewater treatment plant. Additionally, by co-locating the SHCCF with the existing simple cycle facility, there are opportunities for operational synergies across the two facilities and the option to share certain other existing infrastructure. Utilizing the remaining space available at an existing generating facility site enables the Project to maintain a consistent use with other land use in the area, which includes an industrial park, generation and transmission facilities, a landfill, cement mix operations, and a potential future Seminole operations control center. [T.25 (Mathur)].

The SHCCF will sell its electric capacity, energy and ancillary services to Seminole pursuant to a tolling agreement. SHEC is a wholly-owned, indirect subsidiary of GE Capital US Holdings, Inc. ("GECUSH"), which is in turn a wholly-owned, indirect subsidiary of GE. GE Energy Financial Services ("GE EFS"), a business unit of GECUSH, will design, construct, own and operate SHEC. GE EFS has over 35 years of experience managing energy assets through multiple economic cycles, and a global portfolio that spans conventional and renewable power, and oil and gas infrastructure projects. GE EFS invests globally across the capital spectrum in essential, long-lived, and capital-intensive energy assets that meet the world's energy needs. [T.20-22 (Mathur); Exh.29, p.31 of 153].

The tolling agreement between Seminole and SHEC has a term of 30-years from the anticipated commercial operation date of December 1, 2021. Under the tolling agreement, Seminole will have the right to schedule the dispatch of the plant, provide fuel for such scheduled operation, and receive the power produced. Seminole will make fixed payments related to the demonstrated capacity of the Project, and make other variable payments when the plant is dispatched per Seminole's schedules. The terms of the tolling agreement provide Seminole with security of power supply at a competitive price for 30 years. [T.22 (Mathur); Exh.94]. Even Intervenors' witness characterized the costs associated with the tolling agreement as "favorable compared to other options." [T.588 (Sotkiewicz)].

As further discussed in regard to Issues 5A and 5B below, based on the competitive market process, as well as Seminole's internal resource planning process, the resource plan that includes the SCCF coming into service in late 2022, along with the removal from service of one of the existing SGS units, and the SHCCF coming into service in late 2021, is the most cost-effective alternative for meeting Seminole's capacity needs, resulting in projected NPV savings of approximately \$363 million as compared to the next ranked alternative portfolio over the study period. Although Seminole's wholesale rate may increase slightly immediately after the new units come into service, the record demonstrates that the selected resource plan, which includes the SHCCF, will result in the lowest wholesale rates over the course of the study period. [Exh.103, p.20 (Bates Page SECI001619)].

For these reasons, the record demonstrates that the SHCCF will help satisfy the need for adequate electricity at a reasonable cost.

**Issue 4A:**     **Is there a need for the proposed Seminole Combined Cycle Facility, taking into account the need for fuel diversity and supply reliability, as this criterion is used in Section 403.519(3), Florida Statutes?**

**Seminole:**     \* Yes. Seminole seeks to maintain a diversified portfolio of owned and purchased generating assets with a variety of fuel types, sources and delivery options. This enables Seminole to manage fuel price stability and reliability. Seminole’s decision to maintain the operation of an existing coal-fired unit will continue to provide diversification in Seminole’s fuel portfolio. Additionally, Seminole is implementing a natural gas transportation plan to enhance the diversification and reliability of delivered gas supply. \*

**Issue 4B:**     **Is there a need for the proposed Shady Hills Combined Cycle Facility, taking into account the need for fuel diversity and supply reliability, as this criterion is used in Section 403.519(3), Florida Statutes?**

**Petitioners:**     \* Yes. Seminole seeks to maintain a diversified portfolio of owned and purchased generating assets with a variety of fuel types, sources and delivery options. This enables Seminole to manage fuel price stability and reliability. Seminole’s decision to maintain the operation of an existing coal-fired unit will continue to provide diversification in Seminole’s fuel portfolio. Additionally, Seminole is implementing a natural gas transportation plan to enhance the diversification and reliability of delivered gas supply. \*

Seminole seeks to maintain a diversified portfolio of owned and purchased generating assets with a variety of fuel types, supply sources and delivery options. Such a portfolio functions as a tool to manage fuel price stability and reliability. The SCCF and SHCCF will be solely fueled by natural gas, but they will serve to replace expiring purchased power generating resources that were also predominately natural gas-fired. Seminole’s decision to maintain the operation of one SGS coal-fired generating unit will provide continued diversification in Seminole’s fuel portfolio. In addition, Seminole’s inclusion of a 40 MW solar PPA in its final recommended portfolio represents an important strategic addition to the cooperative’s supply portfolio and provides fuel diversity benefits. Further, Seminole is implementing a natural gas transportation plan that includes contracts with four different counterparties for a variety of solutions to enhance the diversification of its delivered gas supply by providing access to

multiple natural gas production basins. For these reasons, the selected portfolio is not expected to significantly impact fuel diversity or supply reliability. [T.211, 219 (Wagner)].

The addition of the SHCCF and SCCF, along with Seminole's decision to remove one of the existing SGS coal units from service, will result in a decrease in the percentage of coal-fired generation in Seminole's overall portfolio from approximately 35% in 2023 to approximately 19% due to the removal of the coal unit and an increase in the percentage of natural gas-fired generation from approximately 61% to approximately 75%. [T.462 (Diazgranados)]. This increase in the percentage of natural gas-fired capacity is commensurate with other generating utilities within Peninsular Florida [T.127 (Ward); Exh.111, p.25 (FRCC forecasted fuel mix)], as well as the trend among utilities across the country who are re-evaluating their coal-fired assets.<sup>6</sup> [T.725-26 (Taylor)]. While this does not represent an increase in fuel diversity with respect to the type of fuel utilized, Seminole's gas transportation plan includes incremental service on two interstate pipelines, one intrastate pipeline, and gas supply bundled with transportation capacity, to complement its existing portfolio of FGT and Gulfstream transportation service. This plan will enhance the diversity and reliability of Seminole's natural gas supply by providing access to gas supplies from multiple production basins. [T.211, 219, 241 (Wagner)]. Additionally, by adding high efficiency combined cycle generation that will displace less efficient purchase power and coal-fired generation, the selected CPP/CC portfolio will reduce Seminole's overall fuel exposure on a MMBtu basis. [T.241 (Wagner)]. As Mr. Taylor also explained at the hearing, because combined-cycle units are more operationally flexible than coal-fired units, the addition of the SCCF and SHCCF could lead to more fuel diversity by allowing Seminole to consider

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<sup>6</sup> See e.g., Order No. PSC-2017-0415-AS-EI, issued on October 24, 2017, in Docket No. 20170123-EI, In re: Petition for approval of arrangement to mitigate unfavorable impact of St. Johns River Power Park, by Florida Power & Light Company (approving settlement agreement related to early shutdown of coal units projected to result in \$183 million in CPVRR savings).

incorporation of renewable plus storage technologies, which currently tend to have limited duration on the order of four hours, as those technologies become potentially cost-competitive.

[T.722-23, 727 (Taylor)]

The Commission has recently approved need determinations for new combined cycle facilities despite projected increases in the utilities' reliance on natural gas-fired generation. In Order No. PSC-14-0557-FOF-EI, issued on October 10, 2014, in Docket No. 20140110-EI, In re: Petition for determination of need for Citrus County Combined Cycle Power Plant, by Duke Energy Florida, Inc., for example, the Commission granted a need determination for DEF's new Citrus County natural gas-fired combined cycle facility notwithstanding the fact that, by replacing coal-fired and nuclear generation, the new unit would cause DEF's projected energy generation from natural gas to increase from 56.6% to 66.2%. In doing so, the Commission recognized that "the diversification of DEF's fuel supply provides the benefits of reduced fuel cost volatility and fuel supply reliability associated with fuel diversity." Id. at p.15; see also, Order No. PSC-16-0032-FOF-EI, issued on January 19, 2016, in Docket No. 20150196-EI, In re: Petition for determination of need for Okeechobee Clean Energy Center Unit 1, by Florida Power & Light Company at p.20 (Noting that fuel diversity is just one factor for consideration, when granting need determination for FPL's Okeechobee combined cycle unit even though the project would "increase [FPL's] its dependence on natural gas and will not improve its overall fuel diversity"). The Commission should follow this precedent and thereby allow Seminole and its Member-Cooperatives to take advantage of the significant cost savings associated with adding new natural gas-fired generation and the strategic decision to remove one of its coal units from service. Otherwise, Seminole would be placed in a rate disadvantage compared to other Florida utilities, and Seminole's Member customers would be unequally financially burdened in

comparison to other Florida consumers due to the inability to replace a coal unit with more efficient and cleaner natural gas-fired generation. [T.725-26 (Taylor)].

Although Intervenors attempt to raise fuel supply reliability as an issue because the SCCF and SHCCF are currently expected to fire only natural gas, the record demonstrates that adding dual-fuel capability would not be cost-effective and is not necessary to maintain fuel supply reliability. In that regard, Seminole hired Black & Veatch to evaluate the need for dual-fuel capability. [T.169 (Kezell)]. As explained in Black & Veatch's report, the need for backup fuel can appropriately be evaluated on a fleet-wide basis rather than an individual plant basis and it should also take into account that natural gas supply impact events typically occur in Florida concurrently with transmission system impacts. [T.169 (Kezell)]. Analysis of dual-fuel usage at Seminole's MGS and several other dual-fuel facilities with which Seminole has or has had PPAs reveals negligible run time on fuel oil other than testing runs, with the last significant run time on fuel oil occurring in 2010. [Exh.10, p.23 of 27]. Moreover, natural gas impact events for Seminole typically occur concurrently with transmission impacts. [Exh.10, p.24 of 27; T.169 (Kezell)]. During such events, Seminole's system is anticipated to be capable of meeting the load and can deliver energy generated either from diesel as a backup fuel or from coal or other resources until the natural gas availability is restored to its normal level. [T.169 (Kezell)]. Furthermore, approximately 40% of Seminole's currently committed resources have dual-fuel capability and Seminole also has access to 122 MW of widely distributed Member owned diesel fired generators (another 3% of committed resources) that can be called upon in times of necessity. [T.168 (Kezell)]. The net effect of adding the SCCF and SHCCF on Seminole's overall system dual-fuel capability only amounts to a reduction of approximately 200 MW or about 5% of Seminole's overall system capacity. [T.244 (Wagner)]. On the state level, for the natural gas-fired combined cycle and combustion turbine units in the FRCC, approximately 77%



of the total portfolio are equipped with dual-fuel capacity and dual-fuel capability is expected to remain relatively stable in the near future. [Exh.10, p.23 of 27]. Thus, as Black & Veatch concluded, considering “the environmental and permitting impacts with dual fuel operation, the reliable nature of the natural gas supply in Florida, and the cost to add fuel oil to the facility, the incremental benefit to add fuel oil as backup for the [SCCF] facility would not result in a commensurate benefit to the [Seminole] system.” [Exh.10, p.26 of 27]. See Order No. PSC-14-0557-FOF-EI, issued on October 10, 2014, in Docket No. 20140110-EI, In re: Petition for determination of need for Citrus County Combined Cycle Power Plant, by Duke Energy Florida, Inc. (approving need determination for single-fuel, gas-fired combined cycle unit).

**Issue 5A:** Will the proposed Seminole Combined Cycle Facility provide the most cost-effective alternative available, as this criterion is used in Section 403.519(3), Florida Statutes?

**Seminole:** \* Yes. Seminole’s analyses demonstrate that the resource plan containing SCCF is the most cost-effective alternative to meet Seminole’s capacity needs and would result in projected NPV savings of approximately \$363 million as compared to the next ranked alternative over the study period. An independent evaluation conducted by Alan Taylor of Sedway Consulting, Inc., confirms that the selected resource plan that includes SCCF is the most cost-effective alternative. \*

**Issue 5B:** Will the proposed Shady Hills Combined Cycle Facility provide the most cost-effective alternative available, as this criterion is used in Section 403.519(3), Florida Statutes?

**Petitioners:** \* Yes. Seminole’s analyses demonstrate that the resource plan containing the SHCCF tolling agreement is the most cost-effective alternative to meet Seminole’s capacity needs and would result in projected NPV savings of approximately \$363 million as compared to the next ranked alternative over the study period. An independent evaluation conducted by Alan Taylor of Sedway Consulting, Inc., confirms that the selected resource plan that includes SHCCF is the most cost-effective alternative. \*

Although Seminole is not subject to the Commission’s “Bid Rule” (Rule 25-17.082, F.A.C.), in March 2016, Seminole issued a competitive RFP for potential power purchase

options to meet its projected capacity needs. [Exhs. 3/29, pp. 138-53 of 153]. The response was robust, with Seminole receiving over 200 proposals from most of the major market counterparties in Florida and the Southeast. [T. 404, 410 (Peters)]. The proposals included offers to provide generation from renewable sources, including solar, wind and battery storage, as well as existing and new gas-fired facilities, and system offers for both intermediate and peaking generation. [T.404 (Peters); Exhs.19, 43].

To evaluate the large number of RFP responses, Seminole brought together subject matter experts (“SMEs”) from various parts of the company, encompassing the following areas of responsibility: supply management, transmission, fuels (including natural gas, coal, and fuel oil), contract administration, power marketing, treasury services, accounting, system operations, and environmental services. The SME group first reviewed all of the proposals to determine if the proposal had all of the required information, such as appropriate qualifications, economics, scheduling rights, and transmission information. [T.404-05 (Peters)]. Seminole then performed an initial economic screening using bus bar cost analysis (i.e., the total cost to operate a resource on a \$/MWh basis) of all alternatives within a stratification (base, intermediate, or peaking). Seminole compared each proposal’s busbar cost in their designated stratification to narrow down uneconomic and outlier offers. Seminole then removed both the offers with undesirable economics based upon the busbar analysis results and any offers that posed significant operational and transmission risks. [T.405 (Peters); T.445 (Diazgranados)].

Contemporaneously with the RFP process for purchase power options, Seminole initiated a bidding process for the power island equipment (PIE) to be installed at the SCCF and a separate bidding process for EPC services in order to develop accurate self-build cost estimates which would then compete with market alternatives. [T.166 (Kezell); Exhs.3/29, pp.50-51 of 153].

Seminole continued to narrow the remaining list of potential alternatives down by evaluating the way they would interact with Seminole's entire portfolio. All remaining alternatives, including self-build options, were modeled and analyzed using System Optimizer, an ABB tool that is an industry-recognized utility model used to develop an optimal resource mix to satisfy future needs. The model simulates how each generating resource, potential resources along with existing resources, will be used to serve the forecasted peak demand and energy requirements in the load forecast. System Optimizer's inputs include the demand and energy forecast, Reserve Margin requirements, fuel price forecast, plus the individual resource's cost and performance characteristics (e.g. fixed cost, variable cost, heat rates, forced outage rates, and maintenance schedules). [T.446 (Diazgranados); Exhs.3/29, p.50 of 153].

Seminole ran multiple iterations through System Optimizer. The first iteration was to develop a portfolio for the need starting in winter of 2022 with all resources available ("SGS 2x1 Portfolio"). Seminole then developed a limited build portfolio which allowed one 1x1 combined cycle unit to be built ("Limited Build Risk: Shady Hills Portfolio"). Seminole also developed a no build portfolio consisting of only PPAs ("No Build Risk: All PPA Portfolio"). In addition, due to the regulatory uncertainty and long-term economics of coal-fired generation, Seminole developed a portfolio taking into account the removal of one coal unit from service ("CPP/CC Portfolio"). [T.446 (Diazgranados); Exhs.3/29, p.50 of 153].

Once the optimal portfolio candidates were identified via System Optimizer, Seminole used Planning and Risk ("PaR"), another industry-recognized utility model from ABB, to further evaluate the production cost. PaR is a detailed production cost model, which commits resources in each hour over the thirty-three year study period from 2018-2051 based on costs and operational constraints. The operational constraints are similar to those in System Optimizer but more extensive, including such constraints as minimum up and down times, must run

requirements, and natural gas pipeline flow limits. The production costs from PaR along with any capital and transmission cost increases for network upgrades are loaded into the corporate financial model to develop the annual revenue requirements. [T.447 (Diazgranados); Exhs.3/29 pp.50-57 of 153].

As presented to Seminole's Board of Trustees in September 2017, the results of Seminole's PaR modeling showed that the CPP/CC Portfolio, which includes the SHCCF beginning at the end of 2021 and the SCCF beginning at the end of 2022, concurrent with the removal from service of one of the two existing 664 MW SGS coal units, was the least cost portfolio, with projected cost savings in terms of NPV revenue requirements of approximately \$355 million as compared to the next-ranked portfolio over the study period from 2018-2051. Seminole also performed multiple sensitivity analyses to assess uncertainties concerning load growth, fuel prices, the potential for additional solar resources, and the potential imposition of carbon taxes. The results of these analyses support the conclusion that the CPP/CC Portfolio provides the most cost effective solution for Seminole's need. [T.448-49 (Diazgranados); Exhs. 3/29, p. 58 of 153; Exhs.24, 48].<sup>7</sup>

After Seminole's Board of Trustees approved the 2018 Budget in October 2017, Seminole updated the economic analyses to incorporate the new budget assumptions, as well as a new load forecast and updated fuel price forecast. The updated economic analyses confirm that the CPP/CC portfolio remains the most cost-effective alternative, with projected NPV cost

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<sup>7</sup> For example, while Seminole's base case analysis was based on the conservative assumption that there will no carbon tax [T.559 (Taylor)], Seminole ran three "carbon tax" scenarios, assuming low, mid, and high carbon costs. [T.448 (Diazgranados)]. The results of those analyses show that the projected savings associated with the CPP/CC portfolio would increase by approximately \$300 million CPVRR for each tier of the carbon cost sensitivity cases. [Exhs.24, 28].

savings of approximately \$363 million over the study period as compared to the next ranked portfolio. [T.450-51 (Diazgranados); Exhs.3/29, pp. 55-57 and 64-65 of 153; Exhs.25, 29].

Seminole also contracted with Mr. Alan Taylor of Sedway Consulting to review Seminole's overall RFP evaluation process and to conduct an independent economic evaluation using Sedway's Response Surface Model ("RSM") and Revenue Requirements Model ("RRM"), as he has done for several Florida utilities who have conducted resource solicitations and ultimately brought need determination cases before the Commission. [T.508-10; T.505 (Taylor)] Mr. Taylor concluded that the process treated proposers fairly and that Seminole's economic evaluation methodology and assumptions were appropriate. [T.510 (Taylor)]. Moreover, his independent analysis confirms that the resource plan selected by Seminole represents the most cost-effective alternative to meet Seminole's projected needs for 2021 and beyond. [T.519-21 (Taylor); Exhs. 27, 51].

The Intervenors provided no evidence, nor is there any evidence in the record, to suggest that Quantum Pasco Power's response to Seminole's RFP is more cost-effective than either the SCCF or SHCCF. Instead, the Intervenors point to the fact that the "No-Build/All-PPA" portfolio would cost approximately \$69 million less in CPVRR terms than the selected resource plan over the first ten years of the study period, and suggest that the Commission focus solely on the short-term and ignore the \$363 million of cost savings that the selected resource plan would provide over the long-term 30-year planning horizon.<sup>8</sup> As Mr. Taylor explained at hearing, the short-term "savings" cited by the Intervenors is to be expected given the fact that revenue requirements for new units decline over time, whereas most PPA pricing structures are flat or escalating over time. [T.710-11 (Taylor)]. Moreover, as Mr. Taylor further explained, the

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<sup>8</sup> It should be noted that the "No Build Risk-All-PPA" portfolio to which Intervenors repeatedly refer does not include Quantum's proposal. [T.709 (Taylor)].

Intervenor’s exclusive focus on the short-term can yield an incomplete and incorrect conclusion about which resource is in the customers’ best interests over the long term because delaying decisions can remove low cost options from consideration and, if the costs of remaining options rise due to inflation or other factors, the result could be much higher costs for ratepayers. [T.711, 716-17 (Taylor)]. This risk of delay is particularly relevant today in light of the potential for increased inflation as the Federal Reserve and other central banks adjust their monetary policies following the past decade of monetary stimulus. [T.713 (Taylor)].

Even Intervenor’s witness Sotkiewicz admits that “most utilities use a 30-year time horizon,” but he argues that his analysis of Seminole’s load forecasting error “militate[s] toward using a shorter analysis in these cases.”<sup>9</sup> [T.590 (Sotkiewicz)]. For the reasons discussed above with regard to Issues 1A and 1B, Dr. Sotkiewicz’s analysis does not support rejection of Seminole’s load forecast, much less abandonment of the long-term planning horizon routinely used by utilities and this Commission in need cases, which generally comports with the life of the generation options under consideration. [T.710 (Taylor); Exh.78 (Seminole Response to Staff Interrogatory No. 40)]. In any event, the record demonstrates that Seminole did consider cost-effectiveness over the short-term as part of the portfolio scoring process which included an economic rating for both short-term (10 year) and long-term (30 year) net present value revenue requirements. [Exhs.3/29, pp.62-63 of 153]. In the end, the selected CPP/CC portfolio was not only the most cost-effective alternative over the long-term planning horizon, but also the most

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<sup>9</sup> Mr. Taylor confirmed that Florida utilities typically utilize long-term planning horizons approximating 30 years for evaluation cost-effectiveness: “Within, I have provided independent evaluation services in numerous RFPs issued by Florida Power & Light, Duke Energy Florida, and Tampa Electric over the last decade, and every evaluation focused on the CPVRR of evaluated portfolios of resources over a 25-year to 35-year planning horizon in determining the least-cost plan for the utilities’ customers.” [T.710; see also T.716].

risk-managed portfolio based on the results of the scoring process conducted by Seminole's multidisciplinary evaluation team. [T.57-58 (Ward)].

Dr. Sotkiewicz also seeks to have the Commission focus exclusively on the short-term by asserting that deferral of project investments would reduce CPVRR impacts because Seminole's discount rate (at 6%) is higher than reasonable escalation rates for combined cycle facility construction costs (in the 2.0%-2.5% range). [T.591-92 (Sotkiewicz)]. As Mr. Taylor explained at hearing, while this is mathematically true in a theoretical sense, it ignores the real world considerations that were factored into Seminole's power supply decisions. Specifically, although general inflation has been low for so long that it is tempting to view it as a permanent macroeconomic condition, there has been a great deal of monetary stimulus undertaken by the Federal Reserve and other nations' central banks over the last decade that could translate into significant price inflation for the materials and labor that go into constructing power plants. Thus, in practice, the theoretical benefits of deferring capital investment can be negated by a rise in escalation/inflation rates. [T.713 (Taylor)].

Based on the evidentiary record, Seminole has demonstrated that the selected CPP/CC portfolio, which includes a blend of new and existing resources in the form of PPAs, the SHCCF tolling agreement, and the SCCF, along with the strategic decision to remove from service one of its coal units, is the most cost-effective alternative over the type of long-term study period routinely used by Florida utilities and this Commission in prior need determination proceedings. Intervenors have presented no evidence to the contrary. Moreover, Intervenors have presented no credible evidence or legitimate policy reason for the Commission to focus exclusively on the short-term and ignore the substantial cost savings that the selected resource plan would provide over the long-term 30-year planning horizon.

**ISSUE 5C: Did Seminole Electric Cooperative, Inc. accurately and appropriately evaluate reasonable alternative scenarios for cost-effectively meeting the needs of its customers over the relevant planning horizon for the SCCF?**

**Petitioners:** \* Yes. When removing a coal unit was assumed in Seminole’s economic analyses, the model selected new units as components of portfolios it identified as potentially cost-effective. Similarly, Mr. Taylor’s independent analysis identified new units as components of the most cost-effective plan. No evidence of record suggests an “All-PPA” portfolio would be cost-effective under any scenario. Additionally, an All-PPA portfolio would force Seminole to rely on resources in balancing areas where the power is not needed. \*

**ISSUE 5D: Did Seminole Electric Cooperative, Inc. accurately and appropriately evaluate reasonable alternative scenarios for cost-effectively meeting the needs of its customers over the relevant planning horizon for the SHCCF?**

**Petitioners:** \* Yes. When removing a coal unit was assumed in Seminole’s economic analyses, the model selected new units as components of portfolios it identified as potentially cost-effective. Similarly, Mr. Taylor’s independent analysis identified new units as components of the most cost-effective plan. No evidence of record suggests an “All-PPA” portfolio would be cost-effective under any scenario. Additionally, an All-PPA portfolio would force Seminole to rely on resources in balancing areas where the power is not needed. \*

Seminole’s RFP and resource planning process, as well as Mr. Taylor’s independent review, accurately and appropriately evaluated reasonably available alternative scenarios for cost-effectively meeting the needs of Seminole customers. As discussed above, Seminole evaluated over 200 proposals in response to its RFP and developed reasonable portfolios for evaluation using System Optimizer, a standard system planning tool utilized throughout the utility industry. [T.410 (Peters); T.445-46 (Diazgranados)]. There is no basis to suggest that the type of all “No Build-All-PPA” portfolio advocated by Intervenors would be cost-effective under any scenario, whether or not a coal unit is assumed to be taken out of service. [T.480 (Diazgranados)]. Additionally, such an All-PPA portfolio would force Seminole to rely on PPA sources in balancing areas where the power is not needed to serve Seminole load; thereby requiring Seminole to wheel it to a different balancing area. This would increase costs and raise



reliability concerns given the fact that Seminole is a transmission-dependent wholesale provider. [T.138 (Ward); T.431-32 (Peters)].

The Intervenors argue that Seminole should have favored a short-term “All-PPA” scenario because it allegedly would allow Seminole to take advantage of “potential improvements” and “reductions in costs” of solar and solar-with-storage technology over the next five to ten years. [Order No. PSC-2018-0151-PHO-EC, at pp. 19, 20 (Intervenors’ Positions on Issues 5C & 5D)]. However, this argument ignores that fact that the selected CPP/CC portfolio includes PPAs with optionality that provide Seminole the ability to decrease the PPA capacity on an annual basis and add additional renewable energy resources, including solar-with-storage, to its resource mix if they become more cost-effective over the near term. [T.132 (Ward)]. Additionally, as Mr. Taylor explained, because the selected resource plan introduces more flexible gas-fired generation into Seminole's portfolio, it will provide an opportunity for Seminole to consider the incorporation of renewable and renewable-plus-storage technologies through the next decade as those become potentially cost-competitive. [T.722 (Taylor)].

Intervenors similarly argue Seminole should have favored a short-term “All-PPA” scenario because it would allow Seminole to take advantage of “possible” advances in Combustion Turbine/Combined Cycle (“CT/CC”) technology and “possible” reductions in CT/CC costs over the next five to ten years. [Order No. PSC-2018-0151-PHO-EC, at pp. 19, 20 (Intervenors’ Positions on Issues 5C & 5D)]. Once again, however, this argument ignores the risk of significant price inflation for the materials and labor that go into constructing power plants. [T.713 (Taylor)]. The record shows that Seminole has executed a contract for the PIE for the SCCF and is in the final stages of negotiating an EPC contract (within 1% of total agreed upon priced) that together will comprise approximately 80% of the SCCF’s total installed cost. [T.693-93 (Kezell)]. The record further shows that Seminole and SHEC have executed a tolling

agreement that establishes Seminole's costs for the power to be delivered by the SHCCF. [Exh.94]. In contrast to the relative price certainty of the SCCF and SHCCF, Intervenors presented no credible evidence to suggest that the costs for CT/CC generation, whether self-build or purchased power, will decline over either the near or long-term horizon.

**Issue 6A: Based on the resolution of the foregoing issues and other matters within its jurisdiction which it deems relevant, should the Commission grant Seminole Electric Cooperative, Inc.'s petition to determine the need for the proposed Seminole Combined Cycle Facility?**

**Seminole:** \* Yes. The SCCF is part of a resource plan that will ensure that Seminole can meet its Members' needs at a reasonable cost. The results of the RFP and resource planning processes demonstrate that the selected plan is the most cost-effective, risk-managed alternative. Seminole and its Members utilize reasonably available renewable resources and conservation programs. However, a significant capacity need remains and the selected resource plan is the least cost alternative to meet that need. \*

For the reasons discussed in issues 1A through 5D above, the Commission should grant the petitions for determination of need for the SCCF and SHCCF because the analyses presented in the testimony and exhibits of the Seminole and SHEC witnesses demonstrate that the two combined cycle facilities are needed to meet the electrical demands of Seminole and its Member Cooperatives and otherwise satisfy all of the criteria set forth in section 403.519, Florida Statutes. The record demonstrates that Seminole accurately and appropriately evaluated reasonable alternative scenarios for cost-effectively meeting the needs of its customers over the relevant planning horizon. The record also demonstrates that the resource plan that includes the SHCCF coming into service in late 2021, and the SCCF coming into service in late 2022, concurrent with the removal from service of one of Seminole's existing coal units at the SGS, is the most cost-effective alternative for meeting Seminole's capacity needs.

Non-approval would mean that Seminole's Members and the Members' end-use member-consumers would be denied the most cost-effective, risk managed power supply solution.

Seminole's required reserve margin would fall below the minimum reserve level in 2021. While additional off-system purchases could perhaps be made to fulfill Member power requirements and maintain the target reserve margin, Seminole would not be able to remove a coal unit from service and the costs of the resulting resource plan would be substantially higher. [T.63, 76 (Ward)]. If both projects were to be denied, the adverse impact would be approximately \$530 million of additional NPV revenue requirements without consideration of any potential transmission impacts, as well as continuation of service of the coal unit. If only the SCCF were denied, the impact would be approximately \$502 million along with the continuation of service of the coal unit. [T.452 (Diazgranados)].

**Issue 6B:** **Based on the resolution of the foregoing issues and other matters within its jurisdiction which it deems relevant, should the Commission grant Seminole Electric Cooperative, Inc. and Shady Hills Energy Center, LLC's joint petition to determine the need for the proposed Shady Hills Combined Cycle Facility?**

**Petitioners:** \* Yes. The SHCCF is part of a resource plan that will ensure that Seminole can meet its Members' needs at a reasonable cost. The results of the RFP and resource planning processes demonstrate that the selected plan is the most cost-effective, risk-managed alternative. Seminole and its Members utilize reasonably available renewable resources and conservation programs. However, a significant capacity need remains and the selected resource plan is the least cost alternative to meet that need. \*

For the reasons discussed in issues 1A through 5D above, the Commission should grant the petitions for determination of need for the SCCF and SHCCF because the analyses presented in the testimony and exhibits of the Seminole and SHEC witnesses demonstrate that the two combined cycle facilities are needed to meet the electrical demands of Seminole and its Member Cooperatives and otherwise satisfy all of the criteria set forth in section 403.519, Florida Statutes. The record demonstrates that Seminole accurately and appropriately evaluated reasonable alternative scenarios for cost-effectively meeting the needs of its customers over the relevant

planning horizon. The record also demonstrates that the resource plan that includes the SHCCF coming into service in late 2021, and the SCCF coming into service in late 2022, concurrent with the removal from service of one of Seminole's existing coal units at the SGS, is the most cost-effective alternative for meeting Seminole's capacity needs.

Non-approval would mean that Seminole's Members and the Members' end-use member-consumers would be denied the most cost-effective, risk managed power supply solution. Seminole's required reserve margin would fall below the minimum reserve level in 2021. While additional off-system purchases could perhaps be made to fulfill Member power requirements and maintain the target reserve margin, Seminole would not be able to remove a coal unit from service and the costs of the resulting resource plan would be substantially higher. [T.63, 76 (Ward)]. If both projects were to be denied, the adverse impact would be approximately \$530 million of additional NPV revenue requirements without consideration of any potential transmission impacts, along with continuation of service of the coal unit. If only the SHCCF were denied, the impact would be approximately \$363 million along with the continuation of service of the coal unit. [T.453 (Diazgranados)].

**Issue 7A:      Should Docket No. 20170266-EC be closed?**

**Seminole:**      \* Yes. Upon issuance of a final order granting Seminole's petition for need determination for the SCCF, Docket No. 20170266-EC should be closed. \*

**Issue 7B:      Should Docket No. 20170267-EC be closed?**

**Petitioners:**    \* Yes. Upon issuance of a final order granting the joint petition of Seminole and SHEC for need determination for the SHCCF, Docket No. 20170267-EC should be closed. \*

Consistent with established Commission practice, these dockets should be closed when the Commission has issued its final order in each docket and the time for reconsideration has passed.

## CONCLUSION

For all the foregoing reasons, and based upon the evidentiary record in this proceeding, Commission precedent, and the criteria for need determinations set forth in Section 403.519, Florida Statutes, Petitioners, Seminole and SHEC respectfully request that the Commission grant Seminole's petition for an affirmative need determination for the Seminole Combined Cycle Facility and the joint petition of Seminole and SHEC for an affirmative need determination for the Shady Hills Combined Cycle Facility.

Respectfully submitted this 4<sup>th</sup> day of April, 2018.

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**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that a true and correct copy of the foregoing was served via electronic mail to the following on this 4th day of April, 2018:

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