

**STATE OF SOUTH CAROLINA**  
**BEFORE THE**  
**PUBLIC SERVICE COMMISSION**  
**DOCKET NO. 2024-203-E**

In the matter of:

Application of Kingtree East 230 for a Certificate of Environmental Compatibility and Public Convenience and Necessity for the Construction and Operation of a 249 MW<sub>AC</sub> Solar and battery Facility in Williamsburg County, South Carolina Pursuant to S.C. Code Ann. § 58-33-10 et. seq., and Request to Proceed with Initial Construction Work, S.C. Code Ann. § 58-33-110(7).

---

**DIRECT TESTIMONY OF DEVI GLICK**

**ON BEHALF OF**  
**KINGSTREE EAST 230 LLC**

**August 9, 2024**

**TABLE OF CONTENTS**

I. Introduction and Purpose of Testimony ..... 1

II. Recommendations ..... 3

III. Kingstree East Project Summary ..... 4

IV. The South Carolina Siting Act..... 5

V. The Need for the Facility ..... 6

VI. System Economy ..... 12

VII. System Reliability..... 19

VIII. Conclusions and Recommendations ..... 21

1     **I.    INTRODUCTION AND PURPOSE OF TESTIMONY**

2     **Q     Please state your name, occupation, and business address.**

3     **A**My name is Devi Glick. I am a Senior Principal at Synapse Energy Economics,  
4            Inc. (“Synapse”). My business address is 485 Massachusetts Avenue, Suite 3,  
5            Cambridge, Massachusetts 02139.

6     **Q     Please describe Synapse Energy Economics.**

7     **A**Synapse is a research and consulting firm specializing in energy and  
8            environmental issues, including electric generation, transmission and distribution  
9            system reliability, ratemaking and rate design, electric industry restructuring and  
10           market power, electricity market prices, stranded costs, efficiency, renewable  
11           energy, environmental quality, and nuclear power.

12           Synapse’s clients include state consumer advocates, public utilities commission  
13           staff, attorneys general, environmental organizations, federal government  
14           agencies, and utilities.

15    **Q     Please summarize your work experience and educational background.**

16    **A**At Synapse, I conduct economic analysis and write testimony and publications  
17           that focus on a variety of issues related to electric utilities. These issues include  
18           power plant economics, electric system dispatch, integrated resource planning,  
19           environmental compliance technologies and strategies, and valuation of  
20           distributed energy resources. I have submitted expert testimony before state  
21           utility regulators in twenty states.

22           In the course of my work, I develop in-house models and perform analysis using  
23           industry-standard electricity power system models. I am proficient in the use of  
24           spreadsheet analysis tools, as well as optimization and electric dispatch models. I  
25           have directly run EnCompass and PLEXOS, and I have reviewed inputs and  
26           outputs for several other models.

1 Before joining Synapse, I worked at Rocky Mountain Institute (RMI), focusing  
2 on a wide range of energy and electricity issues. I have a master’s degree in  
3 public policy and a master’s degree in environmental science from the University  
4 of Michigan, as well as a bachelor’s degree in environmental studies from  
5 Middlebury College. I have more than 11 years of professional experience as a  
6 consultant, researcher, and analyst. A copy of my current resume is attached as  
7 DG-1.

8 **Q On whose behalf are you testifying in this case?**

9 **A** I am testifying on behalf of Kingstree East 230 LLC.

10 **Q Have you previously provided testimony to this commission?**

11 **A** Yes. I submitted testimony in Docket No. 2023-154-E, the 2023 Integrated  
12 Resource Plan for South Carolina Public Service Authority. I also submitted  
13 testimony in a number of fuel cost review dockets, specifically: Docket Nos.  
14 2021-3-E and 2018-3-E for Duke Energy Carolinas, Docket No. 2018-2-E for  
15 South Carolina Electric & Gas, and Docket No. 2018-1-E for Duke Energy  
16 Progress.

17 **Q What is the purpose of your testimony?**

18 **A** Kingstree East 230 LLC is applying for a certificate of environmental  
19 compatibility and public convenience and necessity (CECPCN) for the Kingstree  
20 East 230 Project (“Kingstree East Project”). My testimony shows that the  
21 Kingstree East Project meets the statutory requirements to apply for a CECPCN.  
22 I address how the facility meets the statutory need requirement based on the  
23 integrated resource plans (IRPs) of regional utilities and explain how it provides  
24 economic and reliability benefits to the state of South Carolina.

25 **Q How is your testimony structured?**

26 **A** My testimony is organized as follows:

27 I. Introduction and Purpose of Testimony

28 II. Recommendations

- 1 III. Kingstree East Project Summary
- 2 IV. The South Carolina Siting Act
- 3 V. The Need for the Facility
- 4 VI. System Economy
- 5 VII. System Reliability
- 6 VIII. Conclusions and Recommendations

7 **Q What information do you rely upon for your analysis, findings, and**  
8 **observations?**

9 **A** I rely on publicly available documents and data, which I cite throughout my  
10 testimony.

11 **II. RECOMMENDATIONS**

12 **Q Please provide a brief summary of your conclusions and recommendations.**

13 **A** I find that there is a demonstrated need for the Kingstree East Project based on  
14 the long-term resource plans developed by the South Carolina Public Service  
15 Authority (“Santee Cooper”) and Central Electric Power Cooperative  
16 (“Central”). Both utilities have identified incremental solar photovoltaics (PV) as  
17 part of a least-cost electricity system for South Carolina. Further, Santee Cooper  
18 has discussed challenges with procuring sufficient solar PV to meet its solar  
19 needs, making the need for developers to put forward viable solar projects even  
20 stronger. Santee Cooper has indicated an intention to issue a request for proposal  
21 (RFP) for Solar PV in the near future.

1 **III. KINGSTREE EAST PROJECT SUMMARY**

2 **Q Please describe the primary business activities and experience of Kingstree**  
3 **East 230 LLC as it relates to the application.**

4 **A** Kingstree East 230 LLC is owned by Ingka Investments, a core business of Ingka  
5 Group, the largest owner and operator of IKEA Retail.<sup>1</sup> See the testimony of  
6 Kristin Resar for a more complete description of Ingka.

7 **Q Please provide an overview of the Kingstree East Project.**

8 **A** The Kingstree East Project is a 249 MW<sub>AC</sub> solar PV, single axis tracking project  
9 planned for Williamsburg County, South Carolina. The project will interconnect  
10 with the Santee Cooper Winyah-Hemingway 230 kV transmission line. The  
11 requested commercial operation date is November 1, 2028.

12 **Q What utility service area is the Kingstree East Project located in?**

13 **A** The Kingstree East Project is located in Santee Cooper's service area. Santee  
14 Cooper provides power to its own retail customers and to several wholesale  
15 customers, the largest of which is Central.<sup>2</sup> Central purchases power for the 20  
16 electric cooperatives in South Carolina and has a wholesale purchase agreement  
17 with Santee Cooper known as the Coordination Agreement. Through the  
18 Coordination Agreement, Santee Cooper provides energy and capacity to 15 of  
19 Central's 20 member cooperatives.<sup>3</sup> Santee Cooper and Central perform  
20 coordinated resource planning, and under the terms of the Coordination  
21 Agreement, Central must choose to opt in or out of any new major resources that  
22 Santee Cooper proposes.<sup>4</sup> Given Central's stated interest in procuring solar

---

<sup>1</sup> Ingka Investment, What we do. Available at <https://www.ingka.com/what-we-do/ingka-investments/>.

<sup>2</sup> Santee Cooper. 2023. *Santee Cooper 2023 Integrated Resource Plan*. Available at: <https://www.santeecooper.com/About/Integrated-Resource-Plan/Reports-and-Materials/2023-Santee-Cooper-IRP.pdf>. Page 36.

<sup>3</sup> Central also sources a portion of the power and energy for these cooperatives from the Southeastern Power Administration of the United States Department of Energy, Central Non-Shared Resources, and certain alternative purchases allowed by the Coordination Agreement.

<sup>4</sup> Santee Cooper 2023 IRP at 51.

1 capacity, which I discuss in more detail below, I assume that Central will opt into  
2 the Kingstree East Project. I discuss both Santee Cooper and Central’s resource  
3 planning throughout my testimony.

4 **IV. THE SOUTH CAROLINA SITING ACT**

5 **Q Please describe the statutory requirements for issuing a CECPCN.**

6 **A** South Carolina Code Title 58, Chapter 33, also known as “the Siting Act,”  
7 defines six elements that must be defined before the South Carolina Public  
8 Service Commission (“the Commission”) may grant a “certificate for the  
9 construction, operation and maintenance of a major utility facility.”<sup>5</sup>

10 This testimony addresses the following elements relevant to the Siting Act:  
11 “[t]he basis of the need for the facility,” “[t]hat the facilities will serve the  
12 interests of system economy and reliability,” and “[t]hat public convenience and  
13 necessity require the construction of the facility.”<sup>6</sup> This testimony will also  
14 address the Siting Act requirement that a major utility facility “has been  
15 compared to other generation options in terms of cost, reliability, and any other  
16 regulatory implications deemed legally or reasonably necessary for consideration  
17 by the commission” prior to commencing construction of said facility.<sup>7</sup>

18 The remaining three requirements in the Siting Act, which relate to the “nature of  
19 the probable environmental impact,” “[t]hat the impact of the facility upon the  
20 environment is justified,” and that the facility “will conform to applicable State  
21 and local laws and regulations” will be addressed elsewhere in the project  
22 application.<sup>8</sup>

---

<sup>5</sup> S.C. Code Ann. § 58-33-160.

<sup>6</sup> *Ibid.*

<sup>7</sup> S.C. Code Ann. § 58-33-110(8)(a).

<sup>8</sup> S.C. Code Ann. § 58-33-160.

1 **V. THE NEED FOR THE FACILITY**

2 **Q Please provide a brief synopsis of the need for the facility.**

3 **A** There is currently unmet demand for solar resources in South Carolina. Both  
4 Santee Cooper and Central identified increased solar PV capacity as part of the  
5 least cost, reliable electricity system in their most recent Integrated Resource  
6 Plans (IRP). Santee Cooper included solar procurement as one of its priorities in  
7 its short-term action plan as well.<sup>9</sup> The Kingstree East Project will contribute to  
8 these utilities’ efforts to add additional solar resources to their systems.

9 **Q What national trends in the power sector point to the need for this facility?**

10 **A** During the past decade, the cost to operate and maintain legacy fossil plants,  
11 especially coal plants, has been rising, driving many of these plants to retire. At  
12 the same time, the cost of renewables and clean energy resources has fallen  
13 precipitously, driving a large build-out of renewable generation assets. Between  
14 2015 and 2024, an average of 11.6 gigawatts (GW) of coal retired each year in  
15 the United States.<sup>10</sup> An additional 12.9 GW of coal generation capacity is  
16 scheduled to retire in 2025.<sup>11</sup> Meanwhile, the cost of clean generation  
17 technologies decreased dramatically. Costs for solar are now 83 percent lower  
18 than in 2009, with a compound annual rate of decline of 12 percent per year;  
19 wind and batteries exhibit similar trends.<sup>12</sup>

20 **Q What circumstances in South Carolina point to the need for this facility?**

21 **A** South Carolina is a microcosm of these broader trends in the power sector. The  
22 Commission recently approved Santee Cooper’s 2023 IRP. In this IRP, the  
23 Company outlined its plan to retire the Winyah Generating Station (“Winyah”), a

---

<sup>9</sup> Santee Cooper 2023 IRP at 3.

<sup>10</sup> Energy Information Administration, Preliminary Monthly Electric Generator Inventory (March 2024), available at <https://www.eia.gov/electricity/data/eia860m/>.

<sup>11</sup> *Ibid.*

<sup>12</sup> Lazard. *Levelized Cost of Energy Analysis* (Version 17.0 June 2024). Available at: <https://www.lazard.com/research-insights/levelized-cost-of-energyplus/>.



1 1,150 megawatt (MW) coal-fired plant, by year-end 2030.<sup>13</sup> The near-term  
2 retirement of Winyah is particularly assured given that the U.S. Environmental  
3 Protection Agency (EPA) recently finalized new greenhouse gas rules under  
4 Section 111 of the Clean Air Act (“the Section 111 Rules”). These greenhouse  
5 gas rules primarily apply to existing coal units and new baseload gas plants.  
6 Specifically, the rules require coal units that intend to operate past 2032 but retire  
7 before 2039 to co-fire with natural gas starting in 2030, and coal plants that  
8 intend to operate beyond 2039 to install CCS with 90 percent capture rates by  
9 2032.<sup>14</sup> Coal plants that retire prior to 2032 can avoid all compliance  
10 requirements.

11 **Q What did Santee Cooper and Central’s IRPs find about the need for solar**  
12 **PV?**

13 **A** In its 2023 IRP, Santee Cooper found that it is economic to add substantial solar  
14 capacity in the near-term. Additionally, the Company found that these resources  
15 will provide low-cost energy and capacity to ratepayers as existing fossil  
16 resources such as Winyah retire. Specifically, in the “Economically Optimized”  
17 scenario, Santee Cooper found that it is cost-effective to add 2,200 MW of new  
18 solar generation by 2029 and 750 MW more between 2030 and 2040.<sup>15</sup> The other  
19 three foundational scenarios that Santee Cooper modeled include between 2,250  
20 and 3,550 MW of new solar in their portfolios by 2029.<sup>16</sup> The portfolio that  
21 Santee Cooper ultimately selected as its Preferred Portfolio includes 300 MW  
22 per year of solar from 2026 through 2030,<sup>17</sup> totaling 1,500 MW, and an  
23 additional 1,550 MW in the 2030s.<sup>18</sup>

24 Central’s resource planning reveals a similar shift away from coal- and gas-fired  
25 resources towards renewables, with an emphasis on solar. Central’s generation

---

<sup>13</sup> Santee Cooper 2023 IRP at 1.

<sup>14</sup> 89 Fed. Reg. 39798 (May 9, 2024).

<sup>15</sup> Santee Cooper 2023 IRP at 22.

<sup>16</sup> *Id.* at 16.

<sup>17</sup> *Id.* at 24.

<sup>18</sup> *Id.* at 25.

1 mix transitioned from 79 percent coal in 2005 to 31 percent coal in 2022.<sup>19</sup> In  
2 2022, Central opted out of the natural gas-fired combined cycle plant that Santee  
3 Cooper plans to construct at the Winyah site, citing concerns about the cost and  
4 risks involved in building natural gas pipeline infrastructure at that location.<sup>20</sup>  
5 The reference case modeling scenario from Central’s latest IRP produced a  
6 portfolio that includes 1,600 MW of cumulative utility-scale solar additions  
7 between 2028 and 2035, in addition to 300 MW of solar paired with storage.<sup>21</sup>  
8 This finding is robust across technology sensitivities; even in the scenario with  
9 high technology costs for solar, the model found that it was economic to add  
10 1,600 MW of utility-scale solar by 2035.<sup>22</sup>

11 **Q What is the significance of the Santee Cooper and Central IRP findings?**

12 **A** Santee Cooper and Central’s IRPs are the result of detailed studies that take into  
13 account system economics, reliability, and risk over both the short- and long-  
14 term. After projecting load and assessing the future availability of resources on  
15 their systems, Santee Cooper and Central designed resource portfolios to fill  
16 future gaps in capacity and energy. The fact that solar features prominently in the  
17 economically optimized scenarios and the preferred portfolios of both utilities is  
18 an indication that projects like Kingstree East are needed in South Carolina and  
19 that Santee Cooper and Central recognize this need. As I discuss in more detail  
20 below, an independent assessment of Santee Cooper’s 2023 IRP found that South  
21 Carolina ratepayers would benefit from even more aggressive solar procurement  
22 than what Santee Cooper proposed in its IRP, further underscoring the need for  
23 the Kingstree East Project.

---

<sup>19</sup> Central Electric Power Cooperative. 2023. *Integrated Resource Plan 2024–2043*. Available at: <https://energy.sc.gov/sites/energy/files/2023-12/2023%20Central%20Electric%20Power%20Cooperative%20IRP%C2%A0%28PDF%29.pdf> f. Page 30.

<sup>20</sup> *Id.* at 71.

<sup>21</sup> *Id.* at 100.

<sup>22</sup> *Id.* at 91.

1 **Q Have Santee Cooper and Central taken steps to procure the new solar**  
2 **generation identified in their IRPs?**

3 **A** Yes, Santee Cooper and Central issued a RFP for solar PV projects in 2020, with  
4 the intent of procuring 500 MW of solar capacity.<sup>23</sup> Santee Cooper recently  
5 issued a second RFP for solar PV resources on June 10, 2024, with submissions  
6 due by August 5, 2024.<sup>24</sup> It intends to use this RFP as a first step in procuring the  
7 resources it will need to add 300 MW of solar PV every year from 2026 through  
8 2032.<sup>25</sup>

9 Although the Coordination Agreement limits Central’s ability to procure solar  
10 independently, Central notes that it and its member-cooperatives are pursuing  
11 solar projects throughout the state using methods allowed by the Coordination  
12 Agreement, such as contracting with PURPA Qualified Facilities<sup>26</sup> and  
13 developing solar projects jointly with Santee Cooper.<sup>27</sup>

14 **Q Have Santee Cooper and Central encountered challenges in solar**  
15 **procurement in past RFPs?**

16 **A** Yes, in the Santee Cooper 2023 IRP proceeding (Docket No. 2023-154-E),  
17 Company Witness John Painter submitted rebuttal testimony which explained  
18 that Santee Cooper and Central’s 2020 solar RFP yielded less than the 500 MW

---

<sup>23</sup> Santee Cooper. “Request for Proposals (“RFP”) for Solar Power.” South Carolina Public Service Commission Docket No. 2021-33-E. June 5, 2020. Available at: <https://dms.psc.sc.gov/Attachments/Matter/da3d8885-9c9b-4815-a21c-05b7adc2e442>.

<sup>24</sup> Santee Cooper. “Request for Proposals (“RFP”) for Solar Power.” South Carolina Public Service Commissions Docket No. 2022-351-E. June 10, 2024. Available at <https://dms.psc.sc.gov/Attachments/Matter/e63fa7c1-26f5-4134-b2b6-cae59ddd64f4>.

<sup>25</sup> *Ibid.*

<sup>26</sup> Under the federal Public Utility Regulatory Policies Act (PURPA), utilities must contract with third-party renewable developers whose projects meet the criteria to be a Qualified Facility and whose offer price is less than or equal to the utility’s avoided energy cost. PURPA law supersedes Central’s contract limits, so if renewable energy comes from a Qualified Facility, the penalties under the Coordination Agreement for excess generation do not apply. See: Central 2024–2043 IRP at 27.

<sup>27</sup> Central 2024–2043 IRP at 27.

1 of solar capacity that the utilities intended to procure.<sup>28</sup> Santee Cooper and  
2 Central finalized PPAs for 425 MW of capacity, of which only 200 MW was  
3 actually progressing on schedule towards implementation at the time of his  
4 testimony.<sup>29</sup> Counterparties for the remaining 225 MW of capacity were  
5 generally seeking schedule delays and price increases, with the ultimate project  
6 outcome uncertain, and one counterparty had fully cancelled its project.<sup>30</sup>  
7 Utilities across the country faced similar challenges with solar procurement in  
8 this time period due to inflationary pressures, COVID-related supply chain  
9 disruptions, and tariffs imposed on certain imported solar components.<sup>31</sup> While  
10 these pressures are now easing, some difficulties in procuring solar are likely to  
11 persist going forward, especially after President Biden’s moratorium on tariffs  
12 for imported PV components expires in June 2024.<sup>32</sup>

13 **Q How do recent inflationary pressures and supply chain disruptions in the**  
14 **solar industry impact the need for the Kingstree East Project?**

15 **A** These challenges make it even more important for the Commission to remove  
16 barriers to approval and deployment of solar in the region. Proactive solar  
17 procurement is important so that project delays do not harm South Carolina  
18 residents by forcing them to pay for additional fossil generation or capacity  
19 purchases to make up for shortfalls when existing resources fail or retire, or by  
20 enabling the construction of expensive new fossil resources.

21 As part of its proceeding on Santee Cooper’s 2023 IRP, South Carolina  
22 Commission Staff hired PA Consulting, Inc., a private consulting firm, to

---

<sup>28</sup> Rebuttal Testimony of John F. Painter on behalf of the South Carolina Public Service Authority. South Carolina Public Service Commission Docket No. 2023-154-E. Page 14.

<sup>29</sup> *Ibid.*

<sup>30</sup> *Ibid.*

<sup>31</sup> Examples include Ameren Missouri (Boomtown Solar Project), AES Indiana (Petersburg Energy Center), CenterPoint Indiana (Warrick County and Vermillion County Solar Projects), El Paso Electric (Carne and Buena Vista solar projects), PNM New Mexico (San Juan Solar), and the Massachusetts Municipal Light Plants (Gravel Pit Solar).

<sup>32</sup> LevelTen Energy. 2024. “Q1 2024 PPPA Price Index Executive Summary.” Available at: [https://go.leveltenenergy.com/1/816793/2024-04-12/38wgds/816793/17129734131jplzkrf/2024Q1\\_NA\\_PPAPriceIndex\\_ES.pdf](https://go.leveltenenergy.com/1/816793/2024-04-12/38wgds/816793/17129734131jplzkrf/2024Q1_NA_PPAPriceIndex_ES.pdf).

1 complete an independent review of the IRP. In its final report, PA Consulting  
2 highlighted Santee Cooper’s recent procurement setbacks, as well as anticipated  
3 challenges with a growing interconnection queue in the region. PA Consulting  
4 concluded that these challenges make ambitious solar procurement even more  
5 important, noting that, “being proactive in solar procurement empowers Santee  
6 Cooper to become a market maker, securing resources from a position of  
7 strength rather than reacting to urgent necessity.”<sup>33</sup> Specifically, PA Consulting  
8 recommended “that Santee Cooper be more aggressive in procuring solar  
9 resources, as soon as possible, at a pace of roughly 550 MW a year of solar  
10 procurement.”<sup>34</sup> This provides further evidence of the need for facilities such as  
11 Kingstree East.

12 **Q Are you aware of any other indications of a need for the facilities?**

13 **A** Yes. In addition to the formal procurements from Santee Cooper and Central,  
14 there is increasing demand for solar in South Carolina from a variety of customer  
15 segments. In particular, several municipalities and businesses in the state have  
16 adopted clean energy and climate goals, including the two most populous cities  
17 in South Carolina, Charleston and Columbia. In 2017, the Columbia City  
18 Council set a goal of transitioning to 100 percent clean and renewable energy by  
19 2036.<sup>35</sup> Charleston has a goal to reduce its greenhouse gas emissions 56 percent  
20 below 2018 levels by 2030 and to net zero by 2050.<sup>36</sup> At least ten major  
21 employers in South Carolina have committed to procuring 100 percent renewable  
22 energy, including Walmart, Amazon, and Starbucks.<sup>37</sup> As an increasing number

---

<sup>33</sup> PA Consulting Group, Inc. 2023. *Independent Review of Santee Cooper’s 2023 Integrated Resource Plan*. Prepared for the South Carolina Public Service Commission. Page 44.

<sup>34</sup> *Id.* at 43.

<sup>35</sup> City of Columbia, South Carolina Resolution No. R-2017-058. Establish a Community-wide Twenty Year Target of Powering the City of Columbia, South Carolina with 100 Percent Clean Renewable Energy. Available at: <https://19january2021snapshot.epa.gov/sites/static/files/2020-11/documents/toolbox-southcarolina-resolution.pdf>.

<sup>36</sup> Charleston South Carolina. 2021. *Climate Action Plan*. Available at: <https://www.charleston-sc.gov/904/Climate-Action-Plan>.

<sup>37</sup> Net Zero Tracker. Data accessed May 6, 2024. Available at: <https://zerotracker.net/#companies-table>.

1 of businesses adopt renewable targets, resources such as the Kingstree East  
2 Project will provide an economic advantage for South Carolina, making the state  
3 a more appealing location for businesses to operate.

4 Other South Carolina electric utilities also plan to procure solar capacity, both  
5 because of its cost-effectiveness and to help achieve internal climate targets. In  
6 its most recent IRP, Dominion Energy South Carolina reiterated its commitment  
7 to reaching net zero carbon and methane emissions by 2050, including reducing  
8 emissions from electricity generation 55 percent from 2005 levels by 2030.<sup>38</sup> In  
9 the core scenarios it modeled, Dominion found that solar accounted for between  
10 59 and 67 percent of new resources added (on a nameplate capacity basis).<sup>39</sup>  
11 Duke Energy also found that solar buildout was economic and included several  
12 tranches of solar procurement in the short-term action plan from its 2023 IRP.<sup>40</sup>

13 **Q Please provide your conclusions about the need for the facility.**

14 **A** There is compelling evidence of demand for projects such as Kingstree East from  
15 utilities as well as corporate and municipal customers in the state. Santee Cooper  
16 and Central’s IRPs both recommend sustained solar procurement over the next  
17 decade, and Santee Cooper plans to issue an RFP for solar resources in summer  
18 2024. In light of recent challenges that the utilities have encountered procuring  
19 solar, it is even more important for the Commission to remove barriers for the  
20 Kingstree East Project, and other similar solar resources, to move forward.

21 **VI. SYSTEM ECONOMY**

22 **Q Does Kingstree East serve the interest of system economy?**

23 **A** Yes, after completing detailed analysis as part of their resource planning efforts,  
24 both Santee Cooper and Central found that increasing the amount of solar PV on  
25 their systems would yield economic benefits for customers. In its 2023 IRP,

---

<sup>38</sup> Dominion Energy South Carolina. 2023 Integrated Resource Plan, Revision 1. Page 22

<sup>39</sup> *Id.* at 11.

<sup>40</sup> Duke Energy. 2023 Carolinas Resource Plan, SC Chapter. Page 5.

1 Santee Cooper concluded that “[t]his IRP, and prior planning studies, have  
2 indicated it would be cost effective to add substantial solar resources through the  
3 remainder of the 2020s and into the 2030s.”<sup>41</sup> Central similarly stated that,  
4 “Central’s desire to minimize the power costs of its member-cooperatives, along  
5 with the sustainability objectives of commercial member-owners, drives Central  
6 to strongly support increasing the solar generation on the system.”<sup>42</sup> Below, I  
7 describe the modeling that led Santee Cooper and Central to these findings, as  
8 well as additional benefits the Kingstree East Project would provide by reducing  
9 customer exposure to fuel price volatility and federal regulation of coal- and gas-  
10 fired resources.

11 **Q Please provide more detail on the Santee Cooper and Central economic**  
12 **analyses you reference.**

13 **A** The 2023 IRP was Santee Cooper’s first official IRP since S.C. Act No. 90 of  
14 2021 (“Act 90”) was passed.<sup>43</sup> Act 90 introduced the requirement for Santee  
15 Cooper to submit its IRP to the South Carolina Public Service Commission for  
16 approval subject to a full evidentiary process. Unlike the Company’s prior IRP  
17 and resource planning exercises, for the 2023 IRP, Santee Cooper utilized full  
18 capacity expansion and production cost modeling in EnCompass to simulate  
19 future resource choices and impacts in its service area. Central also used  
20 EnCompass modeling to develop the portfolios in its 2024–2043 IRP.

21 Power system modeling in Encompass takes place in two stages. In the first  
22 capacity expansion stage, EnCompass calculates the least-cost combination of  
23 resource builds and retirements that will reliably meet projected load, subject to  
24 any bounds (e.g., annual build limits) that the modeler specifies exogenously. In  
25 the production cost stage, EnCompass calculates hourly dispatch of plants in  
26 every hour of the year, yielding detailed data on operating costs and system

---

<sup>41</sup> Santee Cooper 2023 IRP at 32.

<sup>42</sup> Central 2024–2043 IRP at 90.

<sup>43</sup> South Carolina General Assembly. A90/R110/H3194. 124<sup>th</sup> Session. Available at:  
[https://www.scstatehouse.gov/sess124\\_2021-2022/bills/3194.htm](https://www.scstatehouse.gov/sess124_2021-2022/bills/3194.htm).

1 reliability. Santee Cooper and Central each modeled multiple core scenarios and  
2 sensitivities in EnCompass to understand the cost, reliability, and risk  
3 implications of a variety of possible futures for their systems.

4 **Q Did the Santee Cooper and Central analyses evaluate whether plans with**  
5 **near-term solar additions would reduce costs for customers?**

6 **A** Yes. In both IRPs, the scenarios with the lowest revenue requirements included  
7 significant solar buildout. As I discussed above, the “Optimized Portfolio” in  
8 Santee Cooper’s IRP includes 2,200 MW of incremental solar capacity by  
9 2029,<sup>44</sup> and the Reference scenario in Central’s IRP includes 1,600 MW of  
10 utility-scale solar and 300 MW of paired solar and storage between 2028 and  
11 2035.<sup>45</sup> Santee Cooper and Central’s modeling shows that solar buildout is cost-  
12 effective not just in these least-cost portfolios but also across a wide range of  
13 assumptions about carbon policies, resource retirements, and technological  
14 availability.<sup>46</sup>

15 **Q How do you know that the price of the Kingtree East Project will bring**  
16 **value to South Carolina customers if the project has not been selected in the**  
17 **RFP yet?**

18 **A** Before contracting with Santee Cooper, Kingtree has to bid into the 2024 Solar  
19 RFP. As part of the RFP process, Santee Cooper will evaluate the pricing of  
20 proposed projects and will only select bids that are economically beneficial to its  
21 ratepayers. Just as Santee Cooper and Central’s IRPs make it clear the solar PV  
22 in general brings value to South Carolina ratepayers, the 2024 Solar RFP will  
23 provide final assurance that Kingtree East specifically is cost-effective.

---

<sup>44</sup> Santee Cooper 2023 IRP at 22.

<sup>45</sup> Central 2024–2043 IRP at 100. Three of the scenarios that Central modeled had slightly lower revenue requirements than the Reference Case (Load Down, High DSM, and No Hampton CC). The least-cost portfolios in all three of these scenarios also included 1,600 MW of utility-scale solar and varying amounts of paired solar and storage.

<sup>46</sup> See, for example, the Santee Cooper 2023 IRP at 111 and Central 2024–2043 IRP at 100.



1 **Q If the project is selected in the Santee Cooper RFP, should that be sufficient**  
2 **to demonstrate that facility is reasonable compared to other generation**  
3 **options?**

4 **A** Yes. As discussed above, the IRP involves extensive and rigorous analysis and  
5 comparison of resources alternatives. The IRP, and the subsequent RFP  
6 supported by the IRP, should be sufficient to demonstrate the value of the project  
7 compared to alternatives.

8 **Q Should Kingtree East be required to conduct analysis comparing the**  
9 **proposed project to other specific generation options?**

10 **A** No. While there is precedent from other states for Commission's to require  
11 utilities to compare bids and analyze RFP results using capacity expansion and  
12 production cost modeling software, that is something that only utilities can do.  
13 Kingtree East does not have access to the competitively sensitive project bid  
14 data, nor does it have access to competitively sensitive utility cost data on  
15 resource alternatives beyond those solicited in the RFP. Therefore, Kingtree  
16 East cannot meaningfully conduct analysis of RFP bids.

17 If the Commission wants utilities in South Carolina to run all RFPs results  
18 through their resource planning models and demonstrate that projects selected  
19 through an RFP are economic relative to alternatives, that requirement should be  
20 clarified in the statute and applied consistently to all projects. In that case, it  
21 would be the responsibility of the relevant utilities, and not project developers  
22 such as Kingtree East, to conduct the analysis as part of the RFP process.

23 **Q What would you expect to see if the project was compared to alternatives,**  
24 **such as combustion turbines (CTs) and other firm capacity resources?**

25 **A** Resource planning is about identifying the needs of the system and evaluating  
26 the least cost resources or portfolio of resources to meet those needs. It is not  
27 about comparing resources head-to-head in a vacuum. The IRP identified Santee  
28 Cooper as having substantial energy needs over the coming years. The IRP  
29 compared solar resources similar to Kingtree East to CTs and a number of other

1 energy and capacity resources. And the IRP identified solar PV as the least cost  
2 manner of meeting some of its energy needs. CTs were not selected as the most  
3 economic means of meeting Santee Cooper’s energy needs. And this result is not  
4 surprising.

5 Solar PV is a zero marginal cost energy resource. This means that Solar PV  
6 provides low-cost energy. CTs are good peaking capacity resources but  
7 expensive energy resources. Just as solar PV doesn’t provide year-round peaking  
8 capacity, a CT doesn’t provide low-cost energy. No resource planning exercise  
9 would identify these resources as providing the same services or being  
10 interchangeable in meeting grid needs.

11 **Q Would you expect increased solar generation to provide any additional**  
12 **economic benefits to South Carolina more broadly, and Santee Cooper and**  
13 **Central specifically, beyond those you have already discussed?**

14 **A** Yes. The Kingstree East Project will contribute to resource diversity in South  
15 Carolina broadly, and within Santee Cooper and Central’s systems more  
16 specifically. While both utilities have plans to install solar in the near term,  
17 South Carolina utilities have not gotten much of their power from solar in recent  
18 years. In 2022, only 0.01 percent of South Carolina’s electric utility generation  
19 came from solar PV, while around 15 percent came from coal and 24 percent  
20 came from natural gas.<sup>47</sup>

21 The project should help with resource diversity and have a stabilizing effect on  
22 rates by reducing customer exposure to fuel price volatility. It will also help  
23 reduce ratepayer exposure to costs related to environmental regulation of fossil  
24 fuel plants.

---

<sup>47</sup> Nuclear accounts for almost 60 percent of South Carolina’s electric utility generation.

1 **Q How does fuel price volatility in both the gas and coal markets harm**  
2 **ratepayers?**

3 **A** Natural gas is a global commodity, which means that both domestic and global  
4 market forces can impact the price and demand for the resource. When the  
5 market is constrained and prices spike, those costs are passed on directly to  
6 ratepayers. This happens through gas prices directly and market energy prices  
7 indirectly. For example, in Dominion South Carolina 2022 Fuel Reconciliation  
8 Docket, gas spending was 60 percent higher than planned. These higher-than-  
9 expected prices resulted in large part from the Russian invasion of Ukraine and  
10 European gas customers turning increasingly to U.S. gas. As a result, Dominion  
11 requesting to recover an additional \$384 million for the period May 2022 – April  
12 2023 for fuel costs alone.<sup>48</sup> Similarly, Duke Energy Carolinas experience a large  
13 increase in gas costs. As of the Company’s 2022 Fuel Reconciliation Docket,<sup>49</sup>  
14 the Company was carrying an under-recovery balance of over \$145 million; this  
15 increased to over \$300 million in its 2023 Fuel Reconciliation Docket<sup>50</sup> filing.  
16 Absent action from the Commission, Dominion and Duke and their shareholders  
17 are not impacted by these gas price spikes—these costs are entirely passed on to  
18 ratepayers.

19 Similarly, the coal market has seen dramatic price volatility in some parts of the  
20 United States over the past few years.<sup>51</sup> There have also been labor challenges  
21 both at the mines and the railroad companies that transport the coal, as coal  
22 workers demand better pay and have more options in the labor market. As more  
23 and more coal plants across the United States retire, the demand for coal will

---

<sup>48</sup> Dominion South Carolina, 2022. Direct Testimony of Allen Rooks, *Exhibit AWR-2*. South Carolina Public Service Commission Docket No. 2022-2-E. February 7, 2022; Dominion South Carolina, 2023. Direct Testimony of Allen Rooks, *Exhibit AWR-2*. South Carolina Public Service Commission Docket No. 2023-2-E. March 8, 2023.

<sup>49</sup> Duke Energy Carolinas, 2022. Direct Testimony of Sigourney Clark, *Clark Exhibit 2*. South Carolina Public Service Commission Docket No. 2022-3-E. July 29, 2022.

<sup>50</sup> Duke Energy Carolinas, 2023. Direct Testimony of Sigourney Clark, *Clark Exhibit 2*. South Carolina Public Service Commission Docket No. 2023-3-E. August 1, 2023.

<sup>51</sup> U.S. Energy Information Administration, “Coal Markets.” *Coal*. Available at <https://www.eia.gov/coal/markets/>.

1 continue to contract. Combined with the labor challenges, this could result in  
2 consolidation among coal companies and subsequently higher prices.<sup>52</sup> Solar  
3 projects like Kingstree East reduce the percentage of the generation mix  
4 provided by fossil resources and therefore reduce ratepayer exposure to fuel price  
5 volatility.

6 **Q Does solar capacity reduce risk of future regulatory costs?**

7 **A** Yes. There are a number of new federal regulations aimed at reducing harmful  
8 emissions and pollutants at both new and existing fossil plants that are expected  
9 to increase the cost of relying on conventional fossil resources. These include the  
10 Good Neighbor Rule, MATS, the updated ELG rule, and the greenhouse gas  
11 limit under section 111 of the Clean Air Act. These, and other, regulations are  
12 going to make carbon-free energy from resources like solar PV, which do not  
13 have emissions or harmful pollutants, even more economic and in demand.

14 **Q Are you surprised by the results of the Santee Cooper and Central analyses?**

15 **A** No, I am not surprised. Utilities across the country, including others in the  
16 southeast, are finding that solar buildout reduces their power costs. For example,  
17 Georgia Power Company's 2023 Resource Mix Study found it would be cost-  
18 effective for the utility to procure 1,500 MW of additional solar capacity by  
19 2030.<sup>53</sup> In light of these broader trends and the low levels of existing solar in  
20 South Carolina, I would expect Santee Cooper and Central's analyses to find  
21 economic benefits to adding solar capacity.

22 **Q Please provide your conclusions about system economy.**

23 **A** A variety of sources indicate that adding solar capacity will provide economic  
24 benefits to South Carolina residents. Solar provides consistently low-cost energy,

---

<sup>52</sup> Duke Energy. 2023. Carolinas Resource Plan, Appendix F (Coal Retirement Analysis).  
Available at: <https://www.duke-energy.com/-/media/pdfs/our-company/carolinas-resource-plan/appendix-f-coal-retirement-study.pdf?rev=4c1c4df441a14248b2e23ba0368d9855>.

<sup>53</sup> Georgia Public Service Commission Docket No. 55378. In Re: Georgia Power Company's 2023 IRP Update. GPC 2023 IRP Update Supplemental Filing Errata 12-7-23 PD, PD Capacity Expansion Plans Supplemental - Errata.xlsx.

1 reducing exposure to fuel price volatility, and because solar generation emits no  
2 carbon or toxic air pollutants, it provides protection against regulatory costs that  
3 are likely to impact fossil resources in the state.

4 **VII. SYSTEM RELIABILITY**

5 **Q Does Kingstree East serve the interest of system reliability?**

6 **A** Yes, both Santee Cooper and Central’s resource planning shows that solar  
7 additions are consistent with maintaining a highly reliable system. This is  
8 consistent with the experience of other similar utilities in the Southeast.

9 **Q Please provide more detail on the Santee Cooper and Central reliability**  
10 **analyses that you reference.**

11 **A** The modeling framework that Santee Cooper and Central used in their IRPs is  
12 designed to ensure that each scenario maintains a set level of system reliability  
13 (generally equivalent to a loss of load event occurring no more than once in ten  
14 years). EnCompass calculates resource additions such that modeled portfolios  
15 meet each utility’s planning reserve margin in the summer and winter and  
16 include sufficient spinning and quick-start operating reserves.<sup>54</sup> The production-  
17 cost runs, because they use a high level of temporal granularity, verify that the  
18 resource mix in each portfolio is adequate to serve projected load.

19 In addition to the modeling it completed for its 2023 IRP, Santee Cooper  
20 completed several recent studies to plan for reliable integration of solar capacity  
21 into its resource mix, including the 2022 Solar Integration Study Report<sup>55</sup> and the  
22 2023 Reserve Margin and ELCC Report.<sup>56</sup> The Solar Integration Study examined  
23 integration costs and generation curtailment for four solar tranches (up to 2,000  
24 MW) on Santee Cooper’s system, both with the current resource mix and after  
25 the retirement of Winyah. The Reserve Margin and ELCC report included an

---

<sup>54</sup> Santee Cooper 2023 IRP at 122.

<sup>55</sup> Astrapé Consulting. 2022. *Solar Integration Study: Final Report*. Prepared for Santee Cooper.

<sup>56</sup> Astrapé Consulting. 2023. *Reserve Margin and Effective load Carrying Capability (ELCC) Study: Public Report*. Prepared for Santee Cooper.

1 analysis of the effective load carrying capability (ELCC) for solar and battery  
2 energy storage system (BESS) capacity added to the Santee Cooper system. Both  
3 studies were performed using the Strategic Energy & Risk Valuation Model  
4 (SERVM), which combines hourly or intra-hourly production cost modeling with  
5 Monte Carlo outage simulation of a range of scenarios that capture variations in  
6 load and weather and evaluate system reliability.

7 **Q What are the findings of the Santee Cooper and Central reliability analyses?**

8 **A** Santee Cooper and Central have ample room on their systems to add solar  
9 capacity without causing reliability concerns. In its 2023 IRP, Santee Cooper  
10 lists only 5 MW of dependable solar capacity out of a total of 5,290 MW of  
11 existing owned generating facilities.<sup>57</sup> Similarly, in Central’s most recent IRP,  
12 the Company listed renewables as the source of only 2 percent of generation in  
13 2022. Looking forward, the four core scenarios in Santee Cooper’s IRP add 2.2–  
14 3.6 GW of new solar by 2029 while continuing to meet reliability criteria.<sup>58</sup>  
15 Santee Cooper acknowledged in its Solar Integration Study that integration of  
16 solar PV onto the system will be easier and less costly as older, inflexible  
17 resources such as Winyah retire and are replaced with fast-ramping resources  
18 that pair more complementarily with solar.<sup>59</sup> Central’s IRP similarly includes  
19 solar buildout across all modeled scenarios.

20 Adding solar capacity now will facilitate reliable system operation into the  
21 future. Solar contributes accredited capacity, especially in the summer, when  
22 ELCCs range from 39 to 27 percent for the first 2 GW of solar, depending on the  
23 amount of solar and BESS already on the system.<sup>60</sup> It also provides a low-cost  
24 energy source to charge BESS resources, and solar paired with storage will be a  
25 key source of firm capacity going forward.

---

<sup>57</sup> Santee Cooper 2023 IRP at 64.

<sup>58</sup> *Id.* at 16.

<sup>59</sup> Santee Cooper, 2023 IRP Solar Integration Study at 17

<sup>60</sup> Santee Cooper, 2023 IRP Reserve Margin Study at 10.

1 **Q** **Would you have expected to see different results and conclusions than those**  
2 **you've described from the Santee Cooper and Central reliability analyses?**

3 **A** No. Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) both have  
4 higher penetrations of solar PV on their systems than Santee Cooper and Central  
5 (the majority is located in North Carolina). The Companies had Astrapé  
6 Consulting perform a solar integration study back in 2018, which was updated in  
7 2021, to help understand how their system needs changed with increasing  
8 penetration. This study found that DEC could accommodate another 976 MW  
9 and DEP another 2,908 MW in Tranche 1 before capacity accreditation would  
10 decline and the need for grid services would increase.

11 Early solar procurement will safeguard system reliability into the future by  
12 helping South Carolina utilities keep pace with national policy development and  
13 giving them an opportunity to learn how to manage a system with higher levels  
14 of renewable penetration.

15 **Q** **Please provide your conclusions about system reliability.**

16 **A** The reliability analyses that Santee Cooper and Central completed as part of their  
17 IRPs indicate that adding solar capacity will not have a detrimental impact on  
18 system reliability. And in fact, as these utilities complete their plans to retire  
19 their legacy fossil plants, their systems will be even better suited to  
20 accommodate new renewable capacity. This is consistent with the findings of  
21 peer utilities, some of which already have higher levels of solar generation than  
22 Santee Cooper or Central. Therefore, I conclude that the Kingstree East Project  
23 serves system reliability.

24 **VIII. CONCLUSIONS AND RECOMMENDATIONS**

25 **Q** **Please summarize your testimony conclusions and recommendations**

26 **A** I find that Santee Cooper and Central's IRPs indicate a clear need for solar  
27 projects like Kingstree East. Solar will lower costs for ratepayers and reduce  
28 exposure to fuel price volatility and future environmental regulation. Demand for  
29 solar from South Carolina municipalities and companies further underscores the

1 need for the project. Additionally, analyses conducted by Santee Cooper and  
2 Central indicate that solar projects such as Kingstree East serve the interests of  
3 system economy and reliability.

4 Based on these findings, I conclude that the public convenience and necessity  
5 requires the construction of the facility, and I recommend that the Commission  
6 approve the CECPCN for the Kingstree East Project.

7 **Q Please provide your assessment of the additional Siting Act provisions noted**  
8 **above.**

9 **A** The Siting Act specifies that “a person may not commence construction of a major  
10 utility facility for generation in the State of South Carolina without first having  
11 made a demonstration that the facility to be built has been compared to other  
12 generation options in terms of cost, reliability, and any other regulatory  
13 implications deemed legally or reasonably necessary for consideration by the  
14 commission.”<sup>61</sup> The modeling analyses that Santee Cooper and Central  
15 completed for their IRPs show that solar capacity is advantageous from a cost  
16 and reliability perspective. As I explained above, the Kingstree East Project will  
17 bid into Santee Cooper’s solar RFP before contracting with the utility, and its  
18 selection as a winning bid will confirm that the facility compares favorably to  
19 other resource options.

20 **Q Does this complete your direct testimony?**

21 **A** Yes, it does.

---

<sup>61</sup> S.C. Code Ann. § 58-33-110(8)(a).