PO Box 2086, Station Terminal
Vancouver, BC V6B 3T2 Canada
T: 604 732 4010
www.vanry.com

Santee Cooper IRP Stakeholder Process 2024-2026

Stakeholder Working Group Meeting #4 – Meeting Summary

Date: November 13, 2024

Time: 12:30 – 3:48 pm EDT

Location: Virtual Meeting via Zoom, Vanry Associates facilitating

Meeting: Santee Cooper Stakeholder Working Group Session #4

This summary includes meeting logistics, presentations, and discussions.
It is organized into the following sections:

- Meeting Information & Materials
- Session Participation
- Topics, Presenters, and Discussion
- Commitments and Next Steps
- Appendix - List of External Stakeholder Working Group Members & September Meeting Attendees

Meeting Information & Materials

The Santee Cooper Resource Planning team held its fourth IRP Stakeholder Working Group meeting on Wednesday, November 13, 2024. The IRP Stakeholder Working Group is integral to Santee Cooper's commitment to engage stakeholders in its ongoing integrated resource planning process. The fourth meeting focused on working group matters, including progress on previous action items and planning for future meetings, alongside IRP business matters such as the 2024 IRP update filing, methodologies for transmission costs, and reserve margin and ELCC assessments. Key topics included the 2023 review and 2026 scope of work for reserve planning, discussions about integrating resource and transmission planning, coal retirement costs, and renewable interconnection impacts.

The presentation that supported the meeting is posted to the Stakeholder Working Group section of the Santee Cooper IRP webpage, along with meeting summaries from the first two working group meetings.

Session Participation

The Stakeholder Working Group includes a set membership of organizations representing diverse interests and perspectives, including government, regulatory agencies, environmental, social, and customer groups. The Santee Cooper Resource Planning team invited each organization to join the working group and assign a primary and secondary member.

Appendix A lists the working group member organizations and the members who attended the November 13, 2024, meeting.

Topics, Presenters, and Discussion

The presentation, which included the meeting agenda and associated timing, was emailed to members on November 6, 2024, and posted to the 2024-2026 IRP Stakeholder Process webpage.

Welcome and Agenda
– Stewart Ramsay, Meeting Facilitator, Vanry Associates

Stewart Ramsay opened the meeting by outlining the meeting outcomes and agenda, which included updates to prior meeting action items, IRP and short-term action plan updates, a discussion of IRP transmission cost modeling, and the latest on the reserve margin and ELCC studies. He reinforced the importance of creating a space for conversation during the session and encouraged participants to use the "raise hand" functionality or to type questions into the meeting chat. He closed by introducing guest speaker Joel Dison from Astrapé Consulting and Chris Wagner, Santee Cooper Director Transmission Planning, who was on hand to listen to member input and respond to technical questions as needed.

Working Group Business
– Clay Settle, Manager Resource Planning, Santee Cooper

Clay Settle led members through an accounting of outstanding action items from the first three meetings, all of which are now underway or completed. The discussion included additional comments and clarifications for members. Of particular concern was Santee Cooper's obligation to protect sensitive information and, therefore, its decision not to share Transmission Impact Analysis (TIA) materials, even with non-disclosure agreements in place.

- Eddy Moore (Southern Alliance of Clean Energy) inquired whether Santee Cooper had considered his request to mean to share the TIA publicly. Clay indicated that it is Santee Cooper's belief that it is not generally permitted to, nor does it plan to publicly share an unredacted version of the TIA.
- Eddy asserted that Santee Cooper was now restricting information that had already been shared, so it is not being protected. Stewart indicated that the previous sharing had come because of a particular regulatory order and was not an ongoing commitment.
- Eddy reconfirmed that his request was not about publicly sharing confidential information and that previous sharing processes have allowed for fruitful discussions. He asked that the meeting summary and record reflect Santee Cooper's position as an unsatisfactory resolution to his original request.

Clay then provided an overview of the South Carolina Regional Transmission Planning (SCRTP) stakeholder process, which complies with FERC Order Nos. 890 and 1000. He encouraged members wanting to delve into electric transmission planning and methodologies to participate in that process.

- Taylor Allred (Coastal Conservation League) asked whether plans for a 500 kV transmission line would be included in SCRTP discussions and when. Chris Wagner indicated that there is no definitive 500 kV plan today other than it is one of the many solutions being discussed, but that it certainly could be and that the SCRTP process would be where 500kV plans would originate.
- Eddy indicated that while no 500 kV plan exists in SCRTP, the IRP includes a significant $1.5 billion project that accounts for 20% of cost differences between scenarios with and without the Cross retirement. He questioned why discussions are being shifted to SCRTP, a forum lacking detailed data on this project, despite its inclusion and modeling in the IRP docket. Chris indicated that there is a request with the SCRTP related to the Cross retirement, which will likely have a 500 KV option, so that is the path to implement that study.

- Eddy asked whether there are limitations on stakeholders using the underlying data to explore alternatives. Chris indicated that, while he is unsure exactly what the data sharing requirements are, there is sharing under provisions related to FERC Order 890 and 1000 as part of the SCRTP process.
- Dave Rogers (Sierra Club) asked if Santee Cooper had any update on when SCRTP would dissolve, and regional planning would shift to SERTP. Chris replied that this would be concurrent with FERC order 1920 compliance and that while the timing is fluid, that would be the plan.
- Anna Sommer (representing Southern Environmental Law Centre) expressed some frustration about the barriers to accessing critical transmission data in the stakeholder group, pointing out that effective integrated system planning requires interaction between transmission and generation modeling. She questioned how Santee Cooper could perform this planning if stakeholders could not discuss or access the necessary transmission information, especially when it's divided between different stakeholder groups. Clay explained that Santee Cooper is trying to improve the integration between resource and transmission planning. However, highlighted that sharing sensitive transmission information is complicated due to confidentiality concerns, which are guided by regulations. Anna supported the goal of integrating the planning processes, stressing that bureaucracy and confidentiality barriers shouldn't prevent stakeholders from accessing the data. She suggested that different levels of data protection could be used to allow appropriate visibility while still maintaining confidentiality where needed. Clay asked to continue the discussion later in the meeting where this topic has been tabled for member input on alternate options.

Clay finished up by reminding members of the Resource Planning working schedule and timelines for the anticipated working group and General Notice meetings in 2025.

- Taylor raised a concern, calling for better accessibility of resource planning information for non-technical audiences for the upcoming general meetings. He maintained his view of a need to improve participation and accessibility in IRP discussions by simplifying technical content and providing more background information. The current level of technical details may discourage everyday participants, such as customers, from engaging meaningfully and sharing their preferences for future system development. To foster better involvement, efforts should focus on creating a more inclusive and approachable environment for non-technical stakeholders. He suggested the working group could meet again before the general notice meeting to refine approaches for stakeholder engagement. He offered recommendations including simplifying technical details in presentations, providing more background information, and incorporating deliberate, prompted feedback opportunities. Taylor also recommended considering targeted questions that allow customers and community members to share insights based on their experiences, such as appliance use, flexibility in energy consumption, and the potential environmental impacts of resource plans.

2024 IRP Update and Short-Term Action Plan
– Clay Settle, Manager Resource Planning, Santee Cooper

Clay provided an overview of the 2024 IRP update, emphasizing key capacity needs: 200 MW by 2027 and over 2,000 MW by 2030-2031, driven by forecasted demand and planned retirements. He reviewed multiple portfolio options, including the 2023 IRP portfolio, an optimized portfolio based on system requirements, a GHG rule-compliant portfolio, and a 2024 portfolio incorporating Power Purchase Agreements (PPAs). The preferred 2024 portfolio with PPAs mitigates risks by replacing one combustion turbine (CT) unit with PPAs and achieves lower costs than other options. Resource additions across portfolios include solar, battery storage, wind, and peaking capacity, with significant upgrades planned from 2029 to 2032. Cost analysis showed the 2024 portfolio with PPAs as the least-cost, least-regret solution, balancing system reliability and economic efficiency. The discussion included sensitivity analysis results, reaffirming the recommended approach.

- Taylor asked to indicate any major changes to the modeling assumptions that might have happened since the last time the working group discussed them. Bob Davis replied that there we no changes to any of those assumptions from what was previously presented however, as was suggested in the working group, an alternative self-build combined cycle case was run and added to the group of portfolios that were evaluated and recorded in the IRP.
- John Burns (Carolinas Clean Energy Business Association) asked if the solar and battery energy solar system (BESS) numbers contemplate solar plus storage projects obtained through PPAs or if the BESS is standalone. Bob replied that solar and battery storage are looked at as separate projects and assumed that they would be for the purpose of modeling. Santee Cooper is utilizing NREL with some adjustments to develop a levelized cost of energy that then simulates a PPA. Bob indicated that this is not to say that Santee Cooper will only engage in PPAs on solar, wind and battery resources; just that, for the purpose of modeling, it is believed that it is a reasonable and appropriate assumption to simulate the generic implementation of these resource types within the IRP.

Clay continued the presentation by outlining efforts to address near-term capacity needs, emphasizing a diversified portfolio of resources rather than relying on any single solution. Key initiatives include upgrades at the Rainey facility, where two CT units will be converted to a combined cycle, adding 178 MW of incremental winter capacity. Additional upgrades at Rainey are also being explored to improve the efficiency of existing units. The combined cycle and other unit upgrades provide approximately 250 MW of cumulative incremental winter capacity at the Rainey Generating Station. Secured through firm transmission reservations of 750 MW across the Duke and Southern interfaces, offer flexibility through 2028, with options for rollover rights for future PPAs. The Cherokee combined-cycle unit, acquired last year, has been evaluated and confirmed for continued operation, adding approximately 100 MW of capacity. A competitive procurement process is underway to expand solar capacity, complemented by 250 MW of battery storage starting in 2027. Together, these efforts aim to meet near-term needs while transitioning toward a more balanced energy mix.

He proposed that the short-term action plan focuses on monitoring and updating load forecasts, implementing planned resource upgrades, and advancing key projects from the 2023 IRP preferred portfolio, including solar and natural gas combined-cycle plants as well as refine options for large CT units to meet growing demand. Regulatory developments will be closely monitored. Stakeholder engagement remains a priority, with continued collaboration in working groups to enhance planning processes. Additionally, feasibility studies for onshore wind are being explored, with efforts underway to create a wind map for South Carolina to inform future IRPs. These initiatives collectively support the transition to a balanced portfolio of coal, natural gas, peakers, and renewables by the early 2030s.

Clay concluded this section by outlining the procedural schedule for the annual IRP update: Santee Cooper filed the update on September 16, 2024, with ORS set to file its report by January 14, 2025, followed by comments from other parties by February 14, 2025. Santee Cooper will respond to comments and the ORS report by March 14, 2025, with proposed orders due March 24, 2025. The final commission order timeline remains to be determined.

- Taylor asked what Santee Cooper's plans are for load forecast changes, including any methodological changes in the modeling or any ad-hoc post-modeling adjustments; or whether there are any major changes in potential new large customers. Clay replied that the load forecast group monitors potential customers and occasionally updates probabilities as needed. They plan to provide updates at future meetings but report no changes to their methodology, focusing instead on ongoing monitoring of potential customers.

IRP Process Overview
– Clay Settle, Manager Resource Planning, Santee Cooper
– Bob Davis, Executive Consultant, nFront Consulting

Clay outlined the analysis process utilized for the 2023 IRP and 2024 IRP Update, which begins with developing and finalizing assumptions, followed by portfolio development to evaluate strategies based on current circumstances. These portfolios are optimized using modeling to identify the most economic options, followed by production cost simulations and sensitivity analyses to calculate total costs, including adjustments. The process concludes with reporting on metrics and the net present value of portfolios. He also explained the current process for the integration of transmission costs into the IRP, which has followed a cyclical approach. Resource portfolios inform Transmission Impact Analysis (TIA) requests, where transmission planning evaluates potential costs for different portfolio strategies. These costs are incorporated into the IRP's reporting post modeling, though transmission costs do not drive specific resource decisions in Encompass.

- Anna asked if it is correct to assume that any study undertaken is a steady-state study and that Santee Cooper will not conduct dynamic or stability studies until the interconnection process is reached. Chris replied that it depends on the scenario and how relevant the stability study might be and its potential impacts, however, typically, those studies would be part of the interconnection process.
- Anna asked about typical timing for doing a steady state analysis in the transmission planning process. She questioned whether Santee Cooper's annual IRP cycle can accommodate integrating transmission modeling into generation studies or if the process would be more feasible on a three-year full IRP cycle. She suggested that moving toward iterative planning, akin to integrated system planning (ISP), would require subjecting generation portfolios to transmission studies proactively rather than reactively through TIAs. The concern is whether the current timeline allows for this level of integration. Chris replied that the timing of a study depends on its scope and that Anna's comments point to a motivating driver toward an integrated approach.

Clay and Bob shared thoughts on the impact of transmission planning on the potential retirement of the Cross coal plant, a major power source for Santee Cooper. In the 2023 IRP, Santee Cooper evaluated four different retirement scenarios, looking at costs for retiring Cross in 2029, 2034, and 2039, along with a no-retirement case. The results showed that delaying retirement reduces costs. Although this analysis was not updated for the 2024 IRP, it remains a key topic for future discussions. Bob acknowledged that while alternative methods could be used to model coal retirements, they are uncertain if the results would differ from the prior findings and invited members' feedback, noting that the retirement decision is closely linked to broader transmission and resource planning.

- Dave asked whether Santee Cooper had considered staggered retirement dates for individual units at the Cross plant, given their different operating characteristics. Bob explained that while open to the idea, previous studies showed better economics when retiring the entire plant rather than individual units. Partial retirements did not yield significant cost savings, particularly in terms of fixed O&M and CAPEX. Bob acknowledged Dave's request for more detailed unit-by-unit cost projections and recognized the interest in this type of analysis for future evaluations.
- Eddy raised concerns about the high transmission costs associated with coal plant retirements, specifically questioning why a $1.5 billion transmission upgrade is needed if new generation is being built within the system. He pointed out a potential inconsistency, asking why the analysis assumes both the construction of new generation and the need for extensive off-system power imports, which seems to drive the need for the transmission investment. Bob responded that while transmission upgrades will still be required, even with delayed plant retirements, the relative economic differences between scenarios wouldn't change significantly. He acknowledges that eliminating transmission costs isn't practical, as some form of upgrade will always be necessary.

- Denny Boyd (Nucor) added to the conversation, asking if the transmission investment is not only driven by coal retirements but also by load growth. Chris confirmed that the 500 kV system upgrade serves multiple purposes, including economic development and integrating renewable energy, in addition to addressing coal retirements like the Cross plant. Eddy followed up questioning why the entire cost is tied to Cross's retirement if the benefits are broader, suggesting that it should be considered a system-wide expense. Clay acknowledged this is an area for consideration for future studies on how to better account for these complexities.
- Taylor asked about potential cost savings from the Energy Infrastructure Reinvestment (EIR) loan program for transmission investments related to coal plant retirements, specifically how it might affect transmission costs. Chris confirmed that Santee Cooper could access discounted loans for such projects but noted that the timing of these funds may not align well with Santee Cooper's plans. Additionally, Bob shared that Santee Cooper already has low borrowing costs, so the benefit from EIR loans might not be significant.
- Taylor suggested that it would be helpful to compare the debt costs between using the EIR program and their usual debt options. He also pointed out that with the Cross retirement planned for 2029, the timing of these funds might be a challenge, as applications for the program are due by the end of 2025. He asked for more details on the timing and feasibility of using the EIR program for major transmission builds. Clay committed to having internal discussions in the interest of generating a summary.
- Taylor noted that many data centers, which are a significant part of the load growth, have strong carbon reduction goals. Retiring a major CO2 source like Cross could make the system more attractive to these data centers. He suggested considering this in an ongoing way, potentially adjusting the expected load growth based on whether or not Cross is retired. Clay appreciated this.
- Dave suggested there is potential to have data centers help cover the costs of retiring coal plants early, as seen in other regions, something to keep an eye on moving forward. He added that while it might not be possible to model certain impacts in the IRP, starting conversations now could influence decisions, especially since tech companies are increasingly focused on their carbon impact. He also asked if Santee Cooper is considering 500 kV for potential nuclear projects. Chris replied, no.
- Will Brown (Santee Cooper Resource Planning) encouraged the group to share any relevant programs or articles related to this such that it could help inform the resource team's planning. Taylor mentioned that a major data center developer on the system has expressed interest in clean energy and is willing to pay a premium for it. They are open to options like sleeve PPAs, similar to a past arrangement with Century Aluminum, which was eventually ended. Taylor suggests there may be existing opportunities, in addition to potential new programs requiring regulatory or statutory changes.
- Bob clarified that specific information from other regulated utilities, particularly about successful programs and cost accounting in vertically regulated systems, would be most useful for their efforts. He noted that initiatives from competitive markets like MISO or PJM are less relevant. Anna asked if the request was about procurement or designing rate recovery for unique energy requests, like those from data centers with specific clean energy needs. Bob explained that it is not about typical cost allocation but creating a unique structure for such customers. Anna noted that the issue is not cost allocation but rather how to design contracts and procurement to align with customers' specific timing needs. Rahul added that discussions on a tailored energy program for large customers are ongoing, which may impact future IRPs.

2023 IRP and 2024 IRP Update Discussion on Transmission Costs
– Clay Settle, Manager Resource Planning, Santee Cooper
– Bob Davis, Executive Consultant, nFront Consulting

After a 10-minute break, Clay and Bob led a more in-depth discussion on IRP-related transmission planning and costs, first fielding questions regarding the assumptions included in the 2023 IRP and 2024 IRP Update, followed by a conversation about current transmission and resource planning practices. Regarding the latter, they sought input from members about alternate approaches being considered.

Current assumptions include transmission upgrade costs against six portfolios: the economically optimized, no new fossil fuel, coal retirement, net zero CO2 by 2025, EPA 111 GHG and the preferred portfolio.

- Taylor asked to clarify whether the presented costs are additional or included in the projects listed in the SCRTP. Clay reminded the group that the assumptions are related to the scenarios being studied. Chris responded that much would depend on the timing of internal project planning and scenario modeling and any overlap. Generally, the costs presented are incremental to already established plans.
- Eddy noted that he believed the identified interconnection costs largely to be for 2000 or more Megawatt solar generators are included in PPAs, with developers covering transmission upgrades, so the costs essentially only a part of the transmission costs. Clay confirmed the costs do not include everything, just those used in the different study scenarios; fair to say not all-inclusive.
- Findlay Salter (Office of Regulatory Staff) asked if the models assumed transmission costs for each resource added, like solar, in the capacity expansion. Clay confirmed that the model assumes costs based on PPA amounts for solar and batteries. The specific costs identified are transmission costs for different scenarios like plant retirements. Bob added that the system upgrade costs are based on the portfolio of resources, including both traditional and renewable energy and include interconnection costs but not broader system upgrades; they are the "last mile" interconnecting to a facility.
- Eddy suggested that given different cost estimates for various projects, citing Winyah, retiring Cross and potential renewable interconnections, these costs may overlap and addressing them together could lead to a better, more efficient plan. Rahul clarified that determining the differences among the portfolios is the focus of the IRP. Each includes similar interconnections, but the exact costs would depend on future projects and sites chosen. Any additional costs from negotiated PPA pricing or development cost sharing would not change the differences among the portfolios.
- Taylor inquired whether Santee Cooper would share in the transmission upgrade costs on Dominion's system, especially for larger projects, specifically for the joint Combined Cycle (CC) plant, and whether those costs are reflected in the current analysis. Chris explained that Santee Cooper and Dominion typically share interconnection costs, but each handles costs for its own system upgrades. Rahul added that the current IRP does not specify an exact location for the future CC plant, so the detailed costs are not included at this time.
- Taylor followed up by inquiring whether the two companies would share costs for broader system upgrades, like fixing thermal violations on Dominion's system. Chris reiterated that each would cover company-specific system costs and work together to find cost-effective solutions for shared projects. Cost-sharing beyond interconnection is not reflected in the current plans.
- Findlay tested his understanding that Santee Cooper and Dominion each perform independent TIAs using similar inputs, resulting in two sets of projects for network upgrades needed to interconnect a joint resource. Chris confirmed this and added the process is optimized to avoid duplicating efforts to

address the same issues. He also confirmed that the costs in the table were based on TIA analysis and represent a regional resource, not a specific site.

Discussion on Transmission Cost and Resource Planning
– Clay Settle, Manager Resource Planning, Santee Cooper
– Bob Davis, Executive Consultant, nFront Consulting

The conversation turned to transmission and resource planning practices with Clay noting that plans are usually created separately but integrated later. Santee Cooper uses a cyclical process and is exploring better ways to estimate transmission costs. Bob suggested the process might take longer than a year, potentially needing a triennial review and that Santee Cooper is open to new ideas and seeking input on estimating transmission costs.

- Expressing appreciation for the topic, John Burns mentioned involvement in prior engagements in Duke's IRP and the carbon plan process in North and South Carolina with the Carolinas Transmission Planning Collaborative (CTPC). He emphasized the importance of proactive, long-term transmission planning, pointing out that it should not just be an annual process. Instead, it should look 10-20 years ahead. He highlighted the need to plan multiple pathways to meet future energy needs and to evaluate the strengths and weaknesses of each option. He mentioned that steps have been taken in Duke's transmission planning processes, but there is more to be done, particularly regarding the Multi-Value Transmission Study (MVST). He offered to share testimony from experts like Mike Haggerty, who provided detailed suggestions for process improvements during hearings in both states. Will thanked him and suggested that he share the information with all members of the working group, which John agreed to do with permission from the experts.
- Anna suggested that the planning process should ideally involve iterating between different tools for resource optimization, resource adequacy, and transmission to provide a more holistic view. Bob acknowledged that undertaking such extensive analysis may be complex and prohibitive to do annually and asked whether others had seen any examples of a more integrated approach to transmission and resource planning as he currently is not aware of any silver bullets – models or tools – that could solve the whole question simultaneously. Anna shared a tool that may offer this, including steady-state analysis, called SAInt, as an option for the team to investigate.
- In the spirit of thinking creatively to manage scope, Anna noted the uniqueness of Santee Cooper's system as it lacks large transmission lines and suggested thinking about upgrades in a more general way. Instead of assigning transmission costs to specific generators, the planning could focus on broader system upgrades to meet future goals, like accommodating more load or renewable energy. Bob agreed and suggested conducting periodic transmission studies to estimate system-wide upgrade costs, which could be a good approach, balancing how detailed the assumptions would need to be for resource planning versus the requirements for more specific project approvals. Both agreed that the focus should be identifying factors significantly affecting costs and avoiding specifics about individual sites.
- Taylor suggested analyzing scenarios where different amounts of non-dispatchable generation, like wind and solar, are treated as curtailable. Bob explained that they already model all wind and solar as curtailable in their analysis, though it usually does not result in significant curtailment.
- Taylor then asked if this is also applied in interconnection studies. Chris Wagner clarified that it depends on how the resource requests interconnection: energy-only resources are curtailable, while capacity resources are not.

- Findlay asked about the TIA status related to the Cross coal plant retirement, specifically whether alternatives like batteries or dispatchable resources at or near the Cross site have been studied instead of relying on off-system purchases and 500 kV upgrades. Clay responded that no additional studies have been done since the 2023 IRP. He welcomed input on how future studies could be approached.
- Findlay followed up to clarify whether the TIA was to be completed first to inform the retirement study. Clay confirmed that the traditional approach is sequential (TIA then retirement study), and Santee Cooper is open to more integrated methods and looking for feedback. Bob added that when conducting TIAs, multiple strategies are considered, not just extreme scenarios. He also shared that as well as looking at Cross retirement options, other alternatives within the coastal areas are being considered, including whether batteries could reduce the need for major transmission upgrades, recognizing uncertainties remaining regarding reliability.
- Eddy mentioned that Dominion's transmission study results varied based on whether generation was assumed at specific sites. He asked what Santee Cooper assumes about generation at Dominion sites, like Williams. Rahul responded by explaining that the discussion was focused on gathering feedback on traditional methods and exploring other approaches used by different utilities. He clarified that questions about generation at specific sites or alternatives like batteries would be addressed in upcoming studies, specifically the coal retirement study. Clay confirmed that feedback would help shape the scope of the next study, which will be discussed in early 2025.

Clay expressed appreciation for the input and encouraged everyone to follow up with thoughts after the meeting that might be helpful to the team as they continue considering alternate planning options.

2026 Reserve Margin and ELCC Study
– Joel Dison, Technical Manager, Astrapé Consulting (PowerGEM)

Joel Dison outlined the methodology for the upcoming reserve margin study for Santee Cooper's system, using SERVM—a simulation tool widely recognized for reliability and economic modeling. The study's goal is not to establish a reserve margin directly but to determine the capacity required to maintain adequate reliability, measured by an industry-standard Loss of Load Expectation (LOLE) of 0.1 days per year or one loss-of-load event every 10 years. This involves running simulations at multiple reserve margin levels to pinpoint the LOLE crossing point. Reserve margin accounting will be performed from this analysis.

The updated study will incorporate several key revisions. Load response modeling will reflect the impact of recent extreme weather events, such as Winter Storm Elliot, ensuring simulations accurately represent system behavior under similar conditions. Historical weather data will be extended through 2023, and the most recent Generating Availability Data System (GADS) data on unit outages will be included. While prior studies analyzed two years (e.g., 2026 and 2029), the new proposal will simplify the analysis to focus on 2030, with the flexibility to adjust to 2031 to account for anticipated resource retirements like the Winyah and Cross plants. The study will also align the resource portfolio with the latest preferred plan and explore separate load-shape components for energy efficiency, EV charging, and data centers.

The previous reserve margin study, conducted around 2021, recommended an 18% reserve margin for Santee Cooper. This new analysis refines those findings using updated inputs and methodologies, ensuring the results reflect current conditions and anticipated system changes. Joel paused, inviting questions and feedback from the audience regarding the proposed approach and the next steps.

- Anna expressed excitement about the plan to separate EVs, energy efficiency, and data centers into different components, which she described as a great improvement. Regarding GADS updates, she asked if Santee Cooper would only revise forced outage rates or use the GADS data, including cause codes, to adjust planned outage rates. Joel indicated the intention to update forced outage rates, maintenance outage rates, and planned outage rates.

Joel continued sharing that the study would include an Effective Load Carrying Capability (ELCC) evaluation for existing and future variable energy resources, such as solar, wind, and storage. For reserve margin accounting, the approach will use a "modified nameplate" method, where thermal resources are accounted for at their full capacity. Variable and energy-limited resources would be accounted for at their ELCC. This approach incorporates outage information from thermal resources into the reserve margin calculation, resulting in a higher reserve margin but reflecting the actual contribution of each resource type.

The ELCC calculations will focus on winter, as that is Santee Cooper's critical period for resource adequacy. The process involves adding a test resource (e.g., solar or battery), reducing the system's LOLE, and then adding load incrementally until the system returns to its original LOLE state. The ELCC is determined by the change in load supported by the added resources, divided by the resource's nameplate capacity. Alternatively, for existing resources, the calculation can involve removing the resource and replacing it with "perfect capacity" to measure its contribution.

The goal of these evaluations is to quantify the reliable capacity value of variable energy resources, recognizing that their ELCC is lower than their nameplate capacity. As more renewables are integrated, this approach can lower the reserve margin until it stabilizes at a level comparable to a system with perfect capacity. This ensures a realistic assessment of the reliability contribution of renewables and energy-limited resources.

- Anna asked if Santee Cooper's greater winter risk results from the fact that most of the LOLE is in the winter and there are no conflating effects by resetting the system to 0.1. Joel replied that that is correct; we look at the loss of load expectation across all months, and most, if not all, of their loss of load expectation is in winter.
- Anna asked if the modified nameplate approach should be changed for this study or if an alternative should be presented to show how PRM accreditation differs when thermal forced outages are attributed to generators rather than load. Clay responded that Santee Cooper would prefer to stay consistent with the other utilities in the state and with what the regulators are expecting.
- Findlay asked what the disadvantages are related to the methods that Anna had referenced. Joel replied that the main drawback of the Unforced Capacity (UCAP) accounting method is that it results in a reserve margin that looks significantly different from traditional methods, such as an 18% Installed Capacity (ICAP) reserve margin. UCAP margins are much lower, and PCAP margins are even lower, which can create stakeholder discomfort, especially in a climate of reliability concerns. This perception issue arises even though reliability remains unchanged.
- Anna replied that this is a good reason to use both methods. She believes it essential to report PRM on both the UCAP and ICAP basis, as it allows for meaningful comparison and aligns with established practices like MISO's PRM studies. The benefits of this approach far outweigh the challenges, as it provides a more accurate assessment of resource value by accounting for actual performance rather than assuming thermal resources are perfect, which no resource truly is. It is fine to report both, but for planning, UCAP should be used at least. Many regions outside the Southeast are adopting more refined accreditation methods, like MISO's direct loss of load approach, which assesses resource capacity based on performance during critical hours. UCAP is the minimum step utilities should take to ensure fair and equitable resource evaluation for adequacy.
- After further clarification questions, Anna reemphasized whether thermal outage risk is accounted for on the load side or the generator side matters for resource selection.

Joel continued the presentation by explaining the difference between average and marginal ELCC and emphasized the importance of accounting for resource synergies in capacity planning. Average ELCC measures the reliability value of an entire portfolio or resource class, while marginal ELCC evaluates the value of the next incremental resource. Both are essential: average ELCC provides insight into the overall value of current resources, while marginal ELCC guides expansion planning by assessing the value of new additions. The analysis also highlights the synergistic benefits of combining technologies like solar, wind, and storage. For example, as solar penetration increases, its marginal ELCC decreases, but adding storage enhances the portfolio's overall ELCC due to the complementary interaction between technologies. Planned calculations will evaluate combinations of solar (up to 6 GW), offshore wind (up to 3 GW), and batteries (4-hour and 8-hour, up to 3 GW each) using two-dimensional matrices. This approach ensures a comprehensive understanding of how the portfolio evolves, enabling Santee Cooper to optimize resource adequacy and account for synergistic benefits in their expansion plans.

- Anna asked how the appropriate resource levels to analyze, such as the 3,000 MW cap for batteries, are determined. Additionally, she asked how thresholds where adding more stops increases the system's value are identified and the right mix of megawatts to evaluate determined. Joel replied that the resource limits were set based on what Santee Cooper considered the theoretical maximum. However, as resources approach these limits, the synergistic value is expected to diminish significantly. If the model still identifies high-capacity value at these levels, adjustments may be made to explore higher resource amounts, as was done in previous studies. The trends in the data suggest it is possible to extrapolate beyond 4,000 as the values flatten at higher levels, making extrapolation straightforward. However, there is a practical limit based on Santee Cooper's size, as the nameplate capacity values are nearing 100% of their load.
- Clay added that the resource limits were based on the 2023 IRP and reflect renewable levels from previous portfolios. Trends from the ELCC study show that as resource levels increase, the ELCC values flatten, making it reasonable to extrapolate beyond the current limits if needed. If further analysis is required, adjustments or sensitivity studies can be considered in collaboration with Astrapé.
- Eddy asked if everything added back falls into the marginal category in the context of retiring over half the system's generation. Joel replied that when evaluating a specific year, like 2028, resources are assessed on a marginal basis. Once added, they become part of the system, and the process repeats for the next year, evaluating the marginal impact of the next resource block.

Clay called for a correction to slide #38 that it should reference both onshore & offshore wind.

Meeting Close
– Stewart Ramsay, Meeting Facilitator, Vanry Associates

Before closing the meeting, Stewart recapped the meeting outcomes and asked members to review the action items identified during the session shared on screen by Peter Claghorn. Several members offered input and suggested edits that Peter captured in real time. The action items are documented in the following section.

Stewart, Clay, and Rahul thanked members for participating and appreciated their commitment and collaboration while discussing and working through the material. This was echoed by members, who valued the open discussion and expressed interest in future meetings. Stewart encouraged members to provide any additional feedback via the post-meeting survey, emphasizing the importance of feedback to improve future meetings.

Commitments and Next Steps

ACTION ITEMS – noted during the meeting discussion	**By WHOM**	**By WHEN**
1. To note the TIA information sharing decision as being an unsatisfactory resolution to Eddy Moore's request	Stewart Ramsay	So noted in this Summary
2. To commit to looking for ways to address the concern of making the General Meeting more accessible and participative and increased attendance	Stewart Ramsay	In advance of the slated meeting in Q1 2025
3. To make sure that the potential opportunity to get data centers to pay for the costs associated with retiring the coal plant earlier is further investigated	Stewart Ramsay	
4. To provide information regarding detailed process improvements from Duke's North Carolina experience and information the CTPC has put together related to how the MVST process works	John Burns	
5. Stakeholders will send Santee Cooper and working group members feedback they would like the company to consider for how to determine transmission costs and incorporate the costs into the IRP modeling by the end of the year	All	By year-end
6. Discuss internally performing portfolio resource adequacy analysis	Clay Settle	
7. Provide resources for reducing costs of debt for consideration and send to Will – borrowing rates, DOE programs that are relevant	Taylor Allred	

Next Steps:

- The next working group meeting is tentatively scheduled for February or March 2025
- Members wishing to present a topic at a future meeting may contact Will Brown or Clay Settle

APPENDIX A

List of Stakeholder Working Group Members and Attendees

ORGANIZATION	MEMBER / ALTERNATE	NOVEMBER 13th ATTENDEE
Office of Regulatory Staff	Findlay Salter **Shane Hyatt**	Findlay Salter Jeffery Gordon Shane Hyatt
SC Dept of Consumer Affairs	**Jake Edwards** Roger Hall	
SC Dept of Natural Resources	Elizabeth Miller **Lorianne Riggin**	
SC Dept of Environmental Services	**Rhonda Thompson** Robbie Brown	Robbie Brown
Central	**Caleb Bryant** Leslie Maley	Caleb Bryant
J. Pollock	Jeffry C. Pollock **Jonathan Ly**	Jonathan Ly
Century Aluminum	**Michael Early** **Stephen Thomas**	Stephen Thomas
Nucor	Bradley Powell **Denny Boyd** Karl Winkler	Denny Boyd
Messer	**Steven Castracane**	Steven Castracane
Google	**Katie Ottenweller** Will Cleveland	
SC Association of Municipal Power Systems	**Adam Hedden** Eric Budds	
Individual	**Charles Hucks**	
Individual	**Richard Berry**	
Individual	**Diane Bell**	
Carolinas Clean Energy Business Association	Hamilton Davis **John Burns**	John Burns
Conservation Voters of South Carolina	Erin Siebert **Jalen Brooks-Knepfle** John Brooker	Jalen Brooks-Knepfle
Coastal Conservation League	Emily Cedzo **Taylor Allred**	Taylor Allred
Energy Justice Coalition	Shayne Kinloch **Zakiya Esper**	Shayne Kinloch
Southern Alliance for Clean Energy	**Eddy Moore** **Maggie Shober**	Eddy Moore
Southern Environmental Law Center	Anna Sommer Chelsea Hotaling **Kate Mixson**	Anna Sommer Chelsea Hotaling Kate Mixson
Sierra Club	**David Rogers** Dori Jaffe Sari Amiel	Dave Rogers Dori Jaffe Sari Amiel

Vote Solar	**Jake Duncan**	Jake Duncan
Santee Cooper Resource Planning	**Clay Settle** Rahul Dembla **Will Brown**	Clay Settle Rahul Dembla Will Brown
Santee Cooper Transmission Planning		Chris Wagner Weijian Cong
Astrapé Consulting (PowerGEM)		Joel Dison
nFront Consulting	**Bob Davis** Jonathan Nunes	Bob Davis Jonathan Nunes
Vanry Associates	Peter Claghorn **Stewart Ramsay** Yvette Smith	Peter Claghorn Stewart Ramsay Yvette Smith

**Members listed in alpha order by first name*