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Chapter SC – The Most Reasonable and Prudent Resource Plan for South Carolina's Future

In this period of broad and profound change in the electric sector, it is increasingly essential that Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (referred to as "DEC" and "DEP" or collectively as "the Companies") build upon the strength of their large and diverse dual-state systems to advance solutions for the energy landscape of today and tomorrow. The Companies have analyzed a variety of potential solutions in our integrated resource plan, referred to overall as the Carolinas Resource Plan (the "Plan" or "the Resource Plan"), which addresses the system energy needs and how we intend to meet those needs over the planning horizon required in South Carolina—the next 15 years. It is important to note that overall the Resource Plan provides significant detail on those analyses, including the Companies' planning methodology and the 15-year demand and energy forecast[1] in Chapter 2 (Methodology and Key Assumptions), a robust portfolio analysis in Chapter 3 (Portfolios) and a detailed Execution Plan in Chapter 4 (Execution Plan) outlining the steps the Companies will need to take in the near-term (2023-2026) and intermediate term (2027-2032) to meet the future energy needs of our customers.

To this end, in assessing the most reasonable and prudent resource plan for the Public Service Commission of South Carolina ("PSCSC" or "Commission") to consider, the Companies have developed a robust resource planning analysis that meets the requirements included in Act 62 of 2019 ("the IRP statute").[2] Accordingly, the Companies present for Commission approval our recommended Portfolio P3 and associated action plans for meeting our South Carolina customers' energy and capacity needs over the next 15-year "Base Planning Period" 2024-2038).[3] The Companies are presenting Chapter SC to more precisely address South Carolina law and policy as part of the system-

[1] See S.C. Code Ann. § 58-37-10.

[2] S.C. Code Ann. § 58-37-40(B)(1).

[3] Order Requiring Modifications to Integrated Resource Plans, Order No. 2021-447 at 85, Docket Nos. 2019-224-E & 2019-225-E (June 28, 2021) ("Order Requiring Modifications to 2020 IRPs") (directing the Companies in their initial IRP under Act 62 to select a "preferred portfolio" in the IRP to comply with § 58-37-40(C)(2)). Portfolio P3 represents the Companies' preferred Portfolio.

wide Plan to serve their dual-state systems. The Companies' full Resource Plan referenced in this Chapter SC can be accessed on the Companies' integrated resource planning website.[4]

Portfolio P3 Charts a Path for Reliable and Increasingly Clean Energy Over the Next 15 Years, and Will be Checked and Adjusted as Needed in Future IRP Filings.

The Companies propose portfolio P3 Base (and the near-term action plans associated with it, together referred to in this SC Chapter as "Portfolio P3") for PSCSC approval.

Portfolio P3 is a plan to serve customers with a diverse fleet that reduces risks to customers, meets customer needs, maintains reliability and affordability, is the most practicable of the portfolios identified and evaluated by the Companies, complies with state and federal laws, provides resource adequacy and capacity, and supports continued economic development in South Carolina and the resulting growth the Companies are both experiencing. Importantly, Portfolio P3 also provides optionality for the Companies and South Carolina to accommodate future economic growth if that growth exceeds our expectations, as there has been a significant uptick in large businesses interested in adding or expanding operations and employment in the service territory.

Portfolio P3 provides the additional capacity and energy needed for load growth across the Companies' system, and also provides for an orderly energy transition at a disciplined and responsible pace over the 15-year planning horizon as the Companies retire and replace (or otherwise repurpose sites where feasible) their 15 remaining coal units, located in North Carolina but also serving South Carolina customers, between now and 2035. The incremental resources associated with Portfolio P3 are shown below:

Figure SC-1: Portfolio P3: Incremental Generation Resources Planned Through 2038

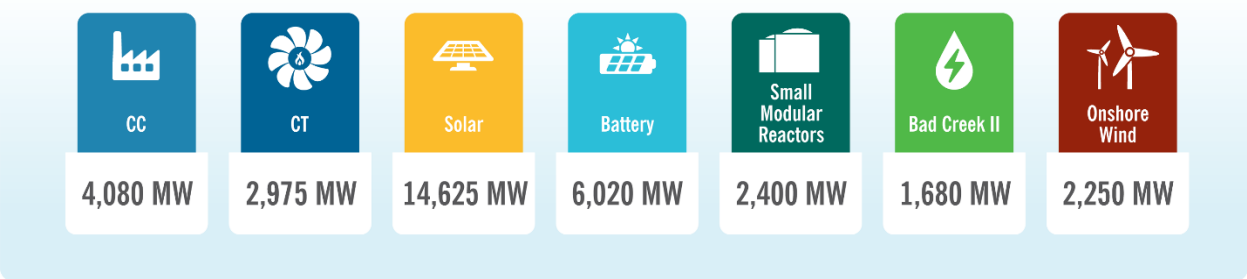


Figure SC-1 above represents the totality of incremental supply-side resource additions in Portfolio P3 by the end of the 15-year Base Planning Period, beyond projects currently in advanced development.

[4] Duke Energy, Integrated Resource Planning in the Carolinas, available at https://www.duke-energy.com/our-company/about-us/irp-carolinas.

These generation and energy storage resources are in addition to robust plans for additional energy efficiency ("EE") and demand-side management programs ("DSM") discussed thoroughly in Chapter 4 and Appendix H (Grid Edge and Customer Programs) as well as investments in the transmission system needed to reliably deliver electricity to our customers and maintain compliance with NERC Reliability Standards as discussed in Appendix L (Transmission System Planning and Grid Transformation).

Portfolio P3 reliably meets the needs of our customers in the rapidly changing energy landscape, including the dramatic, recent economic growth in the Carolinas and the accelerating transition to electric transportation by residential and non-residential customers alike. Concurrently, the Plan retires coal units in a timeframe that mitigates significantly increasing risks and costs as the nation's coal industry declines,[5] while making the most of, and building upon, the Companies' existing set of resources by extending the lives of our nuclear plants, pursuing breakthrough technology advanced nuclear small modular reactors ("SMR"), and extending the license of Bad Creek pumped storage facility ("Bad Creek") and doubling the peak hourly capacity of that facility.

The Plan takes an "all of the above" approach with a diverse set of solutions, including shrinking the challenges of the transition from coal to a lower carbon future by expanding our EE and demand response options, which are the most successful in the region, and offering customers other tools to better manage their electric energy usage and bills. The Plan achieves this while also meeting reliability needs with new hydrogen-capable natural gas resources, battery storage and renewable resources. Additionally, the Plan presents a path to build upon recent economic development activity in our growing regions in a disciplined manner that will aid in preserving the long-term vibrancy and prosperity of the Carolinas, while leveraging tax incentives and credits and combined system operations to help keep costs for South Carolina's energy future lower than they would be otherwise. Under South Carolina's robust triennial IRP review and annual update process established in Act 62, the Companies will need affirmative PSCSC decision-making to execute the fleet transition required to reliably serve our customers at a prudent and responsible pace over the 15-year planning horizon. However, recognizing that resource planning is an iterative process, the PSCSC will also have opportunities to "check and adjust" in the future as policies evolve, new technological developments occur, and more refined information becomes known. Over the next few years, timelines and costs assumed in the modeling will either be validated or challenged by the real-world execution path and such information will be used to refine strategies and improve benefits for customers in future IRPs.

While the 15-Year Plan Can Be Revisited in Future Filings, Portfolio P3 Does Include Actions That Must Be Pursued in the Near-Term in Order to Ensure to Ensure Energy Supply for the Future

Although it may appear that 15 years is a long time to plan and build the resources identified in Portfolio 3, it is not. While the overall balance of the 15-year Portfolio P3 plan will be revisited in future IRPs,

[5] Additional information regarding the electric utility industry's exit from coal can be found in Chapter 1 (Planning for a Changing Energy Future) and Appendix F (Coal Retirement Analysis).

there are nonetheless near-term actions that the Companies must take now to ensure the Companies and our customers have the resources needed—when they are needed. Chapter 4 describes in detail how Portfolio P3 can be accomplished and includes precise actions and timelines necessary to ensure we keep pace with meeting energy needs for our systems. To that end, the Execution Plan includes near term actions for the development and procurement activities the Companies are planning to undertake through 2026 to support supply-side resource additions.

These actions include activities necessary to bring dispatchable hydrogen-capable combined cycle ("CC") plants onto the Companies' system—including a 1,360 megawatt ("MW") CC targeted to be in service by 2029 but also entering into gas fuel contracts and siting activities for 2 more CCs (1,360 MW each) targeted to be online by 2031. These actions also include activities necessary to bring 2 Combustion Turbines ("CT") totaling up to 900 MW online beginning in 2029, with interconnection and siting activities necessary for an additional 425 MW of CT generation occurring through 2031. The next couple of years are also crucial in completing the planned capacity uprate for Bad Creek I and advancing the addition of a second power house (Bad Creek II), which will leverage the existing upper and lower reservoirs at the existing Bad Creek I facility. The second power house will provide an additional 1,680 MW of peak hourly capacity and is targeted to be in service by 2034, but that date will not be met unless key interconnection and transmission work, as well as regulatory proceedings, occur over the course of the next three years. Similarly, in order to have at least 600 MW of SMR online by 2035, the next couple of years are critical in terms of advancing an early site permit ("ESP") and ordering long lead-time equipment. Similarly, while Portfolio P3 indicates a strong need for additional solar on our system, that solar can only come online with steady procurement activity occurring every year through 2026, during which time associated transmission activities will also need to be accomplished so that at least 6,000 MW of incremental solar can be available by 2031. Similar near-term activities associated with onshore wind and batteries must also occur.

Table SC-1 below provides more detail on the near-term activities necessary to advance Portfolio P3.[6]

[6] Additionally, although offshore wind is not identified as needed under recommended Portfolio P3, in order to maintain optionality, the Companies intend to actively monitor the United States' offshore wind market and supply chain development (including challenges recently observed in the market) and continue to evaluate the need to develop offshore wind. We anticipate we will have more information on the viability and necessity of this resource in future IRP filings.

Table SC-1: Supply-Side Near-Term Actions During 2023-2026 That Are Necessary to Pursue Long-Term Resources

Resource	Proposed MW Amount, In-Service Beginning of Year		Activities Targeted for Completion Through 2023	Proposed Near-Term Actions 2024–2026
Solar	6,000	2031	- 2022 Solar Procurement achieved 964.7 MW of new solar[1] - The in-flight 2023 procurement targeting 1,435 MW[1] of new solar (700 MW of which will be paired with 260 MW of storage).	- Continue Red Zone Expansion Projects ("RZEP") 1.0 projects and advance RZEP 2.0 projects.[2] - 2024: Procurement targeting 1,435 MW of solar and solar paired with storage ("SPS") (approximate 2028 in-service date). - 2025 and 2026: Procurements targeting approximately a 2,700 MW to 3,150 MW of solar and dependent on RZEP 2.0 (approximate 2029-2030 in-service date).
Battery Storage[3]	2,700	2031	- Progressing development and interconnection of 1,000 MW[4] of stand-alone battery storage. - 2023 Solar RFP targeting 260 MW SPS.	- 2024 to 2026: Develop and study additional 650 MW stand-alone battery storage. - 2024 to 2026: Target procurement of 790 MW of SPS.
Onshore Wind	1,200	2033	- Carolinas site screening evaluation.	- Select development partner(s), perform site feasibility studies and begin activities associated with siting development for 300, 450 and 450 MW per year (for 1/2031, 1/2032 and 1/2033 in-service, respectively) of onshore wind projects.[5] - Submit interconnection requests into 2025-2026 DISIS interconnection clusters.
CT[6]	1,700	2032	- Interconnection request, pre-CPCN for 2 CTs totaling 900 MW and identify sites and progress planning for additional CT capacity.	- 2024: File CPCN for 2 Marshall Advanced CTs at 900 MW (BOY 2029 in-service), submit air permits, begin transmission build-out engineering/modifications - 2024: Evaluate siting options and submit Interconnection Study requests for 425 MW CT (BOY 2030 in-service) - 2025: File CPCN for 425 MW CT (BOY 2030 in-service) - 2026: Submit interconnection requests/GRR and CPCN for replacement 425 MW CT (BOY 2032 in-service)
CC[6]	4,080	2031	- Interconnection request, pre-CPCN for 1 CC totaling 1,360 MW. - Execute gas contracts for fuel supply. - Identify sites and progress planning for two additional CCs.	- 2024: File CPCN for Person County Advanced CC1 at 1,360 MW (BOY 2029 in-service), submit air permits, begin transmission build-out engineering/ modifications. - 2024: Evaluate siting options and submit Interconnection Requests for 2 additional CCs (1,360 MW each; BOY 2030 & 2031 in-service). - 2025: File CPCNs for 2 CCs (1,360 MW each; BOY 2030 & 2031 in-service).

Resource	Proposed MW Amount, In-Service Beginning of Year		Activities Targeted for Completion Through 2023	Proposed Near-Term Actions 2024–2026
Pumped Storage Hydro	1,680	2034[7]	- Entered 2022 interconnection queue. - Issued RFP for major equipment. - Prepared initial construction estimates. - Continued Federal Energy Regulatory Commission ("FERC") license activities.	- 2024: Sign Interconnection Agreement and begin transmission work, file SC Certificate of Environmental Compatibility and Public Convenience and Necessity ("CECPCN"), design major equipment. - 2025 and 2026: File NC Out of State CPCN, file final FERC application, prepare for construction.
Advanced Nuclear	600	2035	- Evaluating advanced nuclear reactor technologies. - Developing Early Site Permit for Site 1.	- Site 1 – 2023 to 2026: Choose reactor technology, submit ESP, develop construction permit/license application, contract with reactor vendor, and order long-lead equipment. - Site 2 – 2025 to 2026: Develop and submit ESP, begin construction permit/license application.

Note 1 : 2022 Solar Procurement quantity includes added MW from the competitive procurement of renewable energy ("CPRE") that were unawarded as of Q3 2022. 2023 Solar Procurement target includes some added volumes for terminated CPRE contracts and for 2022 Solar Procurement selected winners that declined to execute contracts.
Note 2 : RZEP 2.0 projects subject to local transmission planning process requirements. See Appendix L (Transmission System Planning and Grid Transformation).
Note 3 : Total Battery Storage amount includes a combination of stand-alone battery development and SPS amounts. Some amount of attrition is expected in development process. Annual target quantities, timing of in-service and ratio of stand-alone and SPS may be adjusted during development process.
Note 4 : Includes stand-alone storage resources currently in advanced development.
Note 5 : In order to achieve the target placed in service capacities of 300, 450, 450 MW, a multiple of each year's target capacity will need to be sited and initial development executed. Not all sited projects are expected to be built; some projects may be terminated due to interconnection costs, permitting issues, Federal Aviation Administration or military conflicts, etc. As such, the Companies would seek to site three to four times the targeted capacity.
Note 6 : The exact amounts, models and configurations of gas-fired generation (e.g., simple cycle versus CC) chosen for Plan execution will depend on the specific needs of the system at the time of development — optimizing for multiple factors including but not limited to cost, efficiency, supplier specifications, site parameters and fuel supply. This may also include adjustments to new CT or CC project activity timing for optimization and assurance of timely commercial operation, particularly as it relates to enabling coal unit retirements.
Note 7 : Bad Creek II Pumped Storage Hydro is projected to come into service by mid-2033; for planning purposes, the modeling reflects this resource coming into all resource portfolios at beginning of year 2034.
Note : Offshore Wind is not included in P3 Base Planning Period, but we intend to continue to monitor market developments and opportunities.

It is important to note that critical enabling transmission assumptions are important to facilitate Portfolio P3, including near term activities described above and in Chapter 4, as well as in Appendix L. Additionally, while the table above focuses on supply-side solutions, the Companies remain committed to providing additional EE and demand-side options, helping shrink the challenge of the overall energy transition – see details in Chapter 2 – and are otherwise referenced in multiple sections of the Resource Plan.

Finally, the Companies plan to initiate stakeholder engagement and regulatory proceedings in the near term to merge DEC and DEP, which will consolidate the Companies' system operations functions, to facilitate a more cost-effective and efficient energy transition for customers. Additional detail for the merger of DEC and DEP can also be found in Chapter 4. Those activities will take place outside of this docket and include PSCSC filings at the appropriate time.

Portfolio P3 Includes a Disciplined and Orderly Exit from Coal Generation Through 2035

As explained in Chapter 2, the industry exit from coal continues to put pressure on the supply chain and commodity costs and aging plants continue to present risks for our customers. The next decade is a critical execution phase in the Companies' orderly energy transition as the Companies plan for significant load growth, execute the retirement of 8,400 MW of aging coal units in North Carolina (which serve all of the Companies' customers), repurposing sites where feasible, and replace this significant retiring dispatchable capacity with equally reliable resources. More detail is available in Chapter 4, but the key retirement dates through 2032 for coal plants serving the Companies' South Carolina customers is shown below in Table SC-2.

Table SC-2: Execution Plan – Coal Retirements

Near-Term Actions (2023–2026)	
2024	• Retire Allen 1 & 5 units by December 31, 2024, assuming approvals gained and permission granted to take care, custody and control of Lincoln 17 on January 1, 2024.
Intermediate-Term Actions (2027–2032)	
2028–2029	• Retire Roxboro Units 1 & 2 and Marshall 1 & 2 after their respective in-flight hydrogen-enabled natural gas assets are placed in-service at existing sites.
2031	• Approximate BOY time frame for Cliffside 5 retirement pending equally reliable replacement resources exist to allow retirements.
2031	• Approximate BOY time frame for Mayo retirement pending equally reliable replacement resources exist to allow retirements.
2032	• Approximate BOY time frame for Marshall 3 & 4 retirements pending equally reliable replacement resources exist to allow retirements.

Some of these nearer term dates for coal plant retirements have evolved from the last IRP updates filed with the PSCSC. An overall comparison of all coal retirement dates for Portfolio P3 is shown below in Table SC-3.

Table SC-3: Coal Unit Retirement Schedule Comparison (Retired by January)

Units	Utility	2022 SC IRP Update A2	2023 Resource Plans – Portfolio P3
Allen 1 & 5	DEC	2024	2025[1]
Cliffside 5	DEC	2026	2031
Cliffside 6	DEC	2049	2049[2]
Marshall 1 & 2	DEC	2035	2029
Marshall 3 & 4	DEC	2035	2032
Belews Creek 1 & 2	DEC	2039	2036
Mayo	DEC	2029	2031
Roxboro 1 & 2	DEP	2029	2029
Roxboro 3 & 4	DEP	2028	2034

Note 1 : Allen 1 & 5 retirements are planned by December 31, 2024. The 2022 SC IRP Update assumed these units were planned to be retired by 1/1/2024. These unit retirements have been extended to support the system with additional capacity as a result of load forecast and planning reserve margin targets increases in the 2023 Carolinas Resources Plans.
Note 2 : Cliffside 6 is assumed to cease coal operations by the beginning of 2036. Retirement was not included in the Retirement Analysis based on 100% natural gas capability.

The Companies' plan to retire 14 coal units over time through 2035 is a thoughtful and deliberate undertaking, consistent with industry-wide and state-wide trends.

Portfolio P3 Meets the Requirements and Aspirations of South Carolina Law & Policy

South Carolina law requires that a utility's resource plan balance resource adequacy, affordability, compliance with applicable regulations, reliability, commodity price risk, resource diversity and other foreseeable conditions in determining the most reasonable and prudent plan for South Carolina.[7] This balancing factor test requires much more than focusing on cost alone and Portfolio P3 reasonably balances these factors. But not only does the Companies' Portfolio P3 effectively and reasonably balances the factors required by Act 62, Portfolio P3 is also supported by the overall balance of South Carolina law and policy, including the importance of economic development and growth to the State as reflected in Act 220; long-standing South Carolina energy policy as reflected in the State Energy Plan; recent state Executive Orders; the State's fuel cost recovery statute; recent overarching state legislative actions in Act 236, other provisions in Act 62; and the continuing need to effectuate a diverse and reliable set of resources to meet customer demand.

[7] S.C. Code Ann. § 58-37-40(C)(2)(a)-(g).

The IRP Statute: Portfolio P3 Meets South Carolina's Balancing Test for Determining the Most Reasonable and Prudent Plan for South Carolina

Act 62 of 2019 established a robust new process for Commission review as well as a new standard for approval of the Companies' future IRPs, directing the Commission to consider and balance seven key factors in planning South Carolina's energy future. The Companies' Portfolio P3 includes and appropriately balances the seven key factors as required by S.C. Code Ann. § 58-37-40 (also referred to as "the IRP statute").

Act 62 Balancing Factors, S.C. Code Ann. § 58-37-40(C)(2)

To determine whether the integrated resource plan is the most reasonable and prudent means of meeting energy and capacity needs, the commission, in its discretion, shall consider whether the plan appropriately balances the following factors:

1) resource adequacy and capacity to serve anticipated peak electrical load and applicable planning reserve margins;
2) consumer affordability and least cost;
3) compliance with applicable state and federal environmental regulations;
4) power supply reliability;
5) commodity price risks;
6) diversity of generation supply; and
7) other foreseeable conditions that the commission determines to be for the public's interest.

Resource adequacy - The Companies' Portfolio P3 is comprehensively developed from the ground up to meet customers' resource adequacy needs. From a technical perspective, resource adequacy means having a sufficient amount of electric generating capacity available to meet customer demand for power in all hours of the year and in all operating conditions. The goal of a utility's planning reserve margin is to ensure sufficient resources are available at all times to maintain resource adequacy and operational reliability. Based on growth in customer demand, operational impacts from an increase in variable renewable generation, increasingly constrained winter capacity available from neighboring utilities, the Companies' operational experience and resource-specific data, the 2023 Resource Adequacy Study[8] demonstrates the need for a 22% planning reserve margin for DEC and DEP on a combined basis. As with prior studies, this reserve margin increase assumes a combined view of the Companies and a 22% winter reserve margin is consistent with peer operators across the region. This reserve margin is an increase from the reserve margin in the last IRP and the Companies' planned incremental generation is intended to provide sufficient capacity through the 15-year planning horizon and will help the system "grow into" the necessary reserve margin at a disciplined pace.

[8] See Attachment I (2023 Resource Adequacy Study) for details.

Affordability - Affordable electricity for customers has always been important to the Companies, who have some of the most competitive rates in the nation, as cost-competitive rates and consumer affordability are important for the vitality and growth of the Carolinas. While significant, new investments are needed to retire and replace aging infrastructure and to meet the growing energy needs of our South Carolina customers, the Companies have considered customer affordability and recommended Portfolio P3 as the most reasonable, least cost plan for meeting our system needs. As described in Chapter 3, the present value revenue requirement for Portfolio P3 is lower than any other Core Portfolio for the 15-year Base Planning Period. Affordability is also influenced by other factors, especially for cost mitigation, including the Companies' efforts to gain IIJA and Inflation Reduction Act ("IRA") funding for its projects to lower costs from what they would be otherwise. This means smart planning is important to leverage new facilities on existing coal plant sites where possible, particularly where we can obtain federal funding and leverage existing interconnection and transmission investments, as well as water and land availability. The Companies' strategy of leveraging and flowing back to our customers the IRA tax incentives to lower the cost of the energy transition for customers is explained in Chapter 2. Affordability is also influenced by the Companies making the most of current assets that customers have been paying for years—like the Companies' 11 nuclear units (6 of which are located in South Carolina) for which the Companies are currently seeking, or planning to seek, relicensing from the Nuclear Regulatory Commission ("NRC").[9] Affordability is also influenced by efforts to shrink the challenge of adding new capacity by reducing consumption and our award-winning EE programs help to do just that.[10] Finally, affordability is also supported by the overall economic health of the State, and Duke Energy has been a major driving force in bringing new jobs to South Carolina through economic development. Indeed, in 2022 alone, the Companies helped secure over $3.8 billion in capital investments and over 4,700 jobs to South Carolina.[11]

Reliability - Power supply reliability, like resource adequacy, is a must-have, non-negotiable element in resource planning, and the Companies' Plan is designed to ensure that our system operators have sufficient capacity and energy resource "tools in the toolbox" to meet the growing needs of our customers and to navigate the changing energy landscape. As described in Chapter 2, the Companies' modeling process includes a final "Reliability Verification" step to ensure the portfolios are reliable to meet customers' energy needs. The Companies are also focused on maintaining reliability for our customers during the energy transition as more traditional resources are retired and increasing variable and fuel-free energy resources are added and integrated into the system. Appendix M (Reliability and Operational Resilience) is specifically focused on how the Companies are planning for and reliably executing this energy transition. Not only does Portfolio P3 meet the necessary level of capacity, it does so while accounting for fuel supply risk and resource diversity—which itself acts as a hedge against reliability risk.

[9] For additional information on the Companies' plans to relicense their nuclear fleet, see Chapter 4 (Execution Plan) and Appendix J (Nuclear).

[10] For additional information on the important role of EE and Grid Edge resources in the Companies' Plan, see Chapter 2 (Methodology and Key Assumptions) and Appendix H (Grid Edge and Customer Programs).

[11] Duke Energy 2022 Impact Report.

Commodity price risk - Commodity price risk has been an increasingly important topic in recent years due to volatile coal and gas prices, impacting customers during annual fuel rate adjustment cases. The Companies are well aware of coal price risk, particularly as utilities across the nation shutter coal plants and coal suppliers shift production away from thermal coal, as discussed in more detail in Appendix F (Coal Retirement Analysis). Part of the Companies' strategy in developing the Plan is accounting for these risks, assessing impacts for gas supply alternatives (e.g., Appalachian and Gulf Coast gas), and developing portfolios with fuel diversity that includes a balance of future resources between hydrogen-capable combustion turbines, advanced nuclear and fuel-free resources, such as solar and wind. Built on these principles, Portfolio P3 reasonably addresses commodity price risk through a diverse portfolio of supply-side as well as demand-side resources to serve our customers' future energy needs.

Resource diversity - Portfolio P3 is remarkably diverse, taking full advantage of the Companies' expansive service territories, varied terrain and economies of scale to bring online solar, batteries, advanced nuclear, onshore wind, new hydrogen-capable gas plants and an expansion of the Bad Creek pumped hydro storage facility. The Companies agree with State policy that diversity of resources supports reliability, and the Companies have the expertise to capitalize on that principle and bring reliable electricity to their customers. At the same time, diversity helps to mitigate rate volatility seen in fuel cases. As we bring on more fuel-free generation, we mitigate exposure to the large commodity price swings that can occur in coal and natural gas markets.

Compliance with law and applicable regulations - The Companies must comply with applicable law and regulations. Portfolio P3 is compliant with Act 62 and is supported by the greater balance of SC law and policy as described later in this Chapter. Portfolio P3 also complies with other laws and regulations applicable to Duke Energy and helps positions the Companies for future flexibility, including potential regulations. The Companies' compliance with applicable South Carolina requirements is addressed in Appendix N (Cross Reference).

Other foreseeable conditions - From a modeling standpoint, the Companies have prudently evaluated a number of foreseeable potential conditions including changes in resource availability and gas supply. The pace at which new resources can be procured and connected to the system as well as the sources of natural gas available in the Carolinas are conditions that will significantly affect the pace and cost at which the Companies can continue to execute an orderly energy transition. For example, Chapter 3 and Appendix C (Quantitative Analysis) describes how the Companies' Portfolio Variant analysis considered the potential benefits of alternative gas supply from the Appalachia region if the Mountain Valley Pipeline is completed. Chapter 3 also explains the Companies' sensitivity analyses, including those required by the Commission, to compare potential foreseeable future conditions. Ultimately, there is no way to "future proof" an IRP, which is based on the best-known information available at a specific "snapshot in time." However, there is a set of "knowns" that should inform resource planning for the Companies:

- We know South Carolina has had significant economic development successes and we see a strong likelihood for it continue—and we need to be ready for it, including being able to utilize

renewables for a cleaner generation mix to help South Carolina's largest employers meet their sustainability goals, which is also a driver for further economic development.

- We know federal tax incentives in the IRA and IIJA can bring down the cost of the energy transition, and we need to act in order to leverage those incentives.

- We know that there has been significant decline in coal generation on a national scale, and that is affecting the coal supply chain supply and infrastructure, so we need to be ready to exit coal generation at a disciplined pace, actively bringing on new sources of generation including significant capacity and load following resources.

- We know there will be continued regulatory and legal pressure on carbon-emitting resources, which is why we continue to be mindful of those developments and include technology that will one day help gas generation plants blend or ultimately run on hydrogen, which could help with future regulatory compliance if necessary, and – regardless – could help with natural gas fuel supply constraints.

- We know that there have been supply chain issues and inflationary pressures, which are some of the many reasons South Carolina should act definitively and with certainty so that the Companies' can make investment decisions and take actions to ensure these foreseeable conditions are addressed.

- We know that based on stakeholder engagement activities and questions from the public that there is greater interest than ever before in the Companies' resource plans, and that's why it's important to have a line of sight on our plans such that we can effectively and transparently communicate with customers on the direction in which we're heading.

- We know that a growing portion of customers are buying electric vehicles, and that we will continue to see upward load pressure from the addition of EVs as well as increase in reserve margin to ensure we have the right resources in place as a winter peaking utility that was originally constructed as a summer peaking utility for decades.

- We know that for every kilowatt not used, through expansion of EE and DSM programs, that shrinks the challenge of new resources needed to come online.

- We know that the rapidly changing energy landscape will result in further changes to resource planning, requiring focus on the near-term actions to execute on Portfolio P3 while allowing for future flexibility to check and adjust the plan over time.

In other words, foreseeability includes taking the challenges known and emerging today into account in our plans—which is exactly what Portfolio P3 and associated near-term action plans do. Foreseeability therefore should also shape the evaluation of the recommended portfolio, especially given that Portfolio P3 is the most reasonable, least cost, least risk plan, taking into account all relevant factors and the ability to check and adjust the plan over time as permitted by South Carolina law. Furthermore, the performance sensitivity analysis demonstrates that, of the three Core Portfolios,

Portfolio P3 provides the greatest customer protection from exposure to cost increases in key uncertainties such as technology and fuel prices.

In summary, and as more generally discussed in the Resource Plan itself, the Companies' extensive modeling, robust planning analysis and thorough risk assessments appropriately take into consideration the balancing factors required by the IRP statute and demonstrate clearly that the Plan itself is a reasonable framework for evaluating the Companies' future system needs in this changing energy landscape. Taking all of this analysis into account, the Companies support Commission approval of Portfolio P3 as the most reasonable and prudent plan at this snapshot in time to meet our South Carolina customers' future energy and capacity needs as part of our continued integrated planning for the Carolinas dual-state system to serve the needs of our customers. Accordingly, subject to the Commission's review and approval of the Plan in this proceeding pursuant the IRP statute, the Companies plan to proceed with near-term actions presented in Chapter 4 which are necessary to achieve Portfolio P3.

Commission Approval of Portfolio 3 is Also Supported by Other Provisions of South Carolina Law & Policy

Not only does Portfolio P3 reasonably and effectively balance the factors required by the SC IRP statute, Portfolio P3 is supported by other provisions of South Carolina law and advances the overarching goals of South Carolina policy, including the importance of economic development and growth to the state as reflected in Act 220, long-standing South Carolina energy policy as reflected in the State Energy Plan statute, recent state Executive Orders and General Assembly actions, overarching state legislative actions in Act 236, Act 62, the State's fuel cost recovery statute, and the continuing need to effectuate a diverse and reliable set of resources to meet customer demand.

A summary of relevant statutes, orders and policy developments are summarized in Table SC-4 below.

Table SC-4: Relevant Statutes, Orders and Policy Developments

SC Act 220 of 2022
• S.C. General Assembly found and declared that: - the economic well-being of the State and its citizens depends upon continuing economic development; - the availability of renewable energy resources is an important factor in the decision by a business to locate to or expand their operations in South Carolina; and - the ability to obtain and use renewable energy is necessary to attract businesses to the state and encourage economic growth in South Carolina.
SC Governor's Executive Order No. 2023-18[12]
• Recognized the state's "significant interests" in ensuring the "the safety, security, efficiency, affordability, reliability, resiliency, and sustainability of the State's energy resources." • Concluded that the State must develop a plan focused on, among other things, "protecting and conserving the State's natural and environmental resources, exploring the feasibility of incorporating or incentivizing innovation and technological advances related to energy production, addressing the existing limitations on the State's ability to receive and capability to utilize natural gas, considering current or future opportunities to incorporate additional nuclear power production into South Carolina's diverse generation resources, and identifying any modifications to existing laws, regulations, policies, or procedures that may be necessary to govern effectively, and facilitate the growth of, the State's energy economy." • To "enhanc[e] and diversify[] South Carolina's power production capacity," the Executive Order authorized the Department of Commerce to convene the powerSC Energy Resources and Economic Development Interagency Working Group.[13]
SC State Economic Development and Utility Modernization Committee
• Among the areas of consideration for the Committee are utility modernization, workforce development and infrastructure investment designed to attract industry. • Committee goals include prioritizing the renewable energy demands of businesses that contribute to the economic development of the state, noting that industries looking to locate in South Carolina are demanding clean energy options.[14]

[12] Executive Order No. 2023-18, available at https://dc.statelibrary.sc.gov/handle/10827/51113.

[13] Id.

[14] Speaker Murrell Smith, SC State Economic Development and Utility Modernization Committee Meeting at 09:20, available at https://video.scstatehouse.gov/mp4/20220929HAdHocCommitteeforEconomic12519_1.mp4 (Sept. 29, 2022) (listing goals for the Committee, including prioritizing the renewable energy demands of businesses that contribute to the economic development of the state, noting that industries looking to locate in South Carolina are "demanding" clean energy options).

SC State Energy Plan Statute[15]


• The original legislation, Act 449 of 1992:
  - found that "environmental effects of energy use patterns have a major impact on the quality of our natural resources, the quality of human life, and the ability of the State to attract and retain both industrial and service-related jobs."
• S.C. Code Ann. § 48-52-210(A): "It is the policy of this State to have a comprehensive state energy plan that maximizes to the extent practical environmental quality and energy conservation and efficiency and minimizes the cost of energy throughout the State."
• S.C. Code Ann. § 48-52-210 includes several precepts that are supported by the Companies' Portfolio P3, including:
  - ensuring access to energy at the "lowest practical environmental and economic cost";
  - encouraging the development and use of clean energy resources, including nuclear energy, energy conservation and efficiency, and renewable energy resources;
  - ensuring that energy-related decisions promote the economic and environmental well-being of the State; and
  - ensuring that any energy strategy promotes carbon-free, non-greenhouse gas emitting sources including nuclear energy, renewable resources, and energy conservation and efficiency.

SC Fuel Statute[16]

• The South Carolina fuel cost recovery statute—S.C. Code Ann. § 58-27-865—requires electric utilities to "make every reasonable effort to minimize fuel costs . . . giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service."

[15] S.C. Code Ann. § 48-52-210, et seq.

[16] S.C. Code Ann. § 58-27-865.

Original IRP Statute, SC Act 449 of 1992[17]	
	• Act 449 of 1992: - memorialized the importance of energy to individuals, businesses, government, and the state's economic well-being; - declared that the environmental effects of energy use impacts the quality of natural resources and human life; - recognized that expenditures on out-of-state fuels represents a "monetary outflow" for SC; - provided for the development of a comprehensive State Energy Plan to, among other things "ensure access to energy supplies at the lowest practical environmental and economic cost"; and - provided for the Commission's adoption of energy efficiency procedures to incentivize utilities to invest in energy efficiency and conservation programs.
CPRE & Renewable Energy Statute, SC Act 62 of 2019	
	• Act 62 of 2019: - directed the Commission consider the benefits of longer-duration solar contracts "to promote the state's policy of encouraging renewable energy";[18] - directed the Commission to "ensure that the revenue recovery, cost allocation, and rate design of utilities that it regulates . . . properly reflect changes in the industry as a whole, the benefits of customer renewable energy, energy efficiency, and demand response;"[19] - authorized the Commission to create "programs for the competitive procurement of energy and capacity from renewable energy facilities . . . within the utility's balancing authority area;"[20] and required that utilities propose renewable energy programs for consideration by the Commission, noting that the renewable energy facilities "may be located anywhere in the electrical utility's service territory within the utility's balancing authority."[21]

Below, we describe how planning for and pursuing the resources included in Portfolio P3 is also consistent with South Carolina law and policy even apart from the IRP statute.

1. South Carolina law & policy supports the Companies' pursuit of nuclear plant relicensure and advanced nuclear generation as included in Portfolio P3.

Extending the lives of the Companies' nuclear units and pursuing advanced nuclear is consistent with South Carolina law and policy. Executive Order No. 2023-18 recognizes the State's interest in exploring and incentivizing technological advancements in energy production, as well as "current or

[17] 1992 Act No. 449; *see also* S.C. Code Ann. § 58-37-40 (1993).

[18] S.C. Code Ann. § 58-41-20(F)(2).

[19] S.C. Code Ann. § 58-41-05.

[20] S.C. Code Ann. § 58-41-20(E)(2).

[21] S.C. Code Ann. § 58-41-30

future opportunities to incorporate additional nuclear power production into South Carolina's diverse generation resources." Further, the Executive Order recognizes that S.C. Code Ann. § 13-7-20 empowers the Division of State Development of the Department of Commerce with the responsibility to promote and develop "atomic energy resources" in South Carolina, further supporting the Companies' intent to pursue advanced nuclear resource development. The Companies' proposed activities under Portfolio P3 related to nuclear power are also consistent with the pronouncements of the General Assembly regarding the state energy plan—S.C. Code Ann. § 48-52-210—including ensuring access to energy at the "lowest practical environmental and economic cost"; encouraging the development and use of "clean energy resources, including nuclear energy"; and ensuring that any energy strategy promotes "carbon-free, non-greenhouse gas emitting sources including nuclear energy." These resources also stand to benefit from federal incentives through the IRA, enhancing their cost-effectiveness and customer affordability. Finally, nuclear is an incredibly reliable resource, and pursuing license extensions and additional nuclear generation is consistent with the direction in the fuel statute that the Companies give due regard to reliability as a key factor in its operations (see S.C. Code Ann. § 58-27-865).

Extending Nuclear Plant Operating Lives

Extending the operating lives of the Companies' existing nuclear units is a bedrock assumption of not only Portfolio P3, but of the entire Resource Plan, providing for the continuation of a major source of reliable, dispatchable, zero-carbon, cost-competitive power through mid-century in every portfolio. The Companies have long been leaders in successful nuclear operations, with our first nuclear plant beginning commercial operation more than 50 years ago in 1971. The Companies' 11 reactors (6 of which are in South Carolina) have operated for 24 consecutive years with greater than 90% capacity factor, a testament to their reliability.

Accomplishing this important Resource Plan objective requires federal regulatory approval of 20-year subsequent license renewals for the 11 existing nuclear generation units operating at 6 nuclear stations across the Carolinas. These resources, totaling 11,113 MW of winter capacity, have consistently supported customers' need for a reliable power supply, continued resource adequacy, customer affordability and contributing to the diversity of the Companies' generator fleet—all important IRP statute balancing factors. Relicensing these units will continue to support these critical statutory objectives.

Nuclear energy has helped Duke Energy generate reliable, baseload, clean energy while providing high-paying jobs, significant tax revenues, and creating many other economic benefits for communities in South Carolina and North Carolina. While the electricity generation from wind and solar resources provides fuel-free electricity for the benefit of our customers, this electricity is variable and not a replacement for baseload capacity. A firmer, around-the-clock generation source is needed, and nuclear power is the only carbon-free generation source that is available 24-hours a day regardless of weather conditions.

All 11 of the Companies' existing nuclear units received operating license extensions giving the Companies the option to run these resources to 60 years and renewing the licenses a second time

will allow these plants to operate to at least 2050. As the Companies continue to retire their coal-fired plants and bring other resources online, license renewal for the nuclear plants will allow them to continue providing the baseload generation to continue to reliably serve customers' energy needs.

As explained in Appendix J (Nuclear), in addition to extending the operating licenses at each site, the Companies are also pursuing power uprates projects at Catawba Nuclear Station and McGuires Nuclear Station where the units' design can accommodate additional output. The Brunswick Nuclear Plant is also pursuing an increased power output for both units by implementing a measurement uncertainty recapture project, allowing for more accurate measurement of parameters in the plant resulting in additional incremental power output. Finally, Catawba, Harris and McGuire nuclear facilities are undergoing projects to extend the fuel cycle length from 18-months to 24-months for each of the five reactors. This will increase the time between refueling outages and therefore increase the units' capacity factor and total energy output over the remaining life of the plant.

Emissions-free generation that can be counted on 24-hours a day is critical to South Carolina's future. Portfolio P3 continues Duke Energy's commitment to nuclear energy to serve South Carolina customers.

Advanced Nuclear

In addition to investments into subsequent license renewal and unit power uprates for the Companies' existing nuclear facilities, Portfolio P3 also includes plans for developing 2,400 MW of advanced nuclear resources by 2038. Advanced nuclear concepts include designs like SMR that generate up to approximately 350 MW per unit compared to existing larger plants that can be greater than 1,000 MW. For reference, Duke Energy's Oconee plant, located in Oconee County, South Carolina, is a traditional nuclear plant consisting of 3 units capable of producing a total of more than 2,600 MW. Unlike traditional, larger nuclear facilities, SMR are more compact and construction is modular and can be completed offsite, and overall cost to build is lower.

Siting an advanced nuclear unit at an existing or retiring coal-fired plant can leverage existing transmission, interconnection and water supplies, keeping project development costs as low as possible. Additionally, there is added incentive in the IRA to site a nuclear plant at a retiring coal plant. It's also planned to have multiple units per site resulting in economies of scale, The SMR design that the Companies are evaluating will be better able to ramp up and down as compared to traditional nuclear plants, giving the utility increased operational flexibility to meet dynamically changing load. There is a variety of advanced nuclear technologies, but the Companies are initially focused on SMR for the first sites given reduced regulatory and development risk since they are based on similar technology of today's large light-water reactors, use the same fuel type, and most have proven supply chains.

Strategically, the Companies are not planning to be a "first mover" with SMR – but follow close behind other first-of-a-kind projects that are planned, incorporating the lessons learned from those projects, which reduces our risk exposure. Ontario Power Generation has already announced plans to build an SMR designed by GE Hitachi at its Darlington site in Ontario with an estimated 2029 online date. Similarly, Tennessee Valley Authority has announced its intent to evaluate deployment of the same

SMR design at its Clinch River site in Oak Ridge, Tennessee, expecting to submit a construction permit application to the NRC in Q1 2024. NuScale has a contract with Utah Associated Municipal Power Systems to build its SMR plant at Idaho National Laboratory, with the first module to be operational by 2029. These developments are discussed in more detail in Appendix J.

Beginning the process now allows the Companies to take advantage of IRA benefits earlier for our customers. Because these are long-lead time resources, and because the Companies do not plan to be first, we are not proposing to move forward with project development immediately, but the Companies do intend to continue technology evaluations of the leading reactor designs and develop and submit an ESP to the NRC for the top preferred site. By taking these actions, the Companies are making progress and preserving the option of SMR for our customers. This pursuit of nuclear and IRA benefits to make it more affordable is consistent with the importance the General Assembly places on planning for energy in a way that "maximizes to the extent practical environmental quality and energy conservation and efficiency and minimizes the cost of energy throughout the State."

As explained in Chapter 3, the Companies' Portfolio P3 as well as each of the Portfolio Variants, especially the delayed nuclear Variant, identify the value in deploying SMR as soon as it becomes available to be selected by the model. If advanced nuclear is going to be part of our energy future (or even an option in the time frame we need it), approval of the recommended Plan and its inclusion of nuclear is key. Approval is warranted because pursuit of these resources is consistent with South Carolina law and policy and is also consistent with the Companies' long history of providing safe, reliable nuclear power in this State and the Companies look forward to building on that track record moving forward with these new, more flexible baseload resources.

Approving Portfolio P3 and permitting the Companies to move forward with their proposed near-term activities related to nuclear power is consistent with the balancing factors of the IRP statute specifically and South Carolina law and policy generally and will drive value for South Carolina customers. Executive Order No. 2023-18 directed the development of a plan and coordinated strategy that would both "incentiviz[e] innovation and technological advances related to energy production," and "consider[] current or future opportunities to incorporate additional nuclear power production into South Carolina's diverse generation resources." The Executive Order also acknowledged S.C. Code Ann. § 13-7-20 by which the General Assembly empowered the Department of Commerce with the responsibility to promote and develop "atomic energy resources" in South Carolina. South Carolina law and policy support nuclear resource development, contributing to the Companies' reliable resource mix for the benefit of customers in the State. The Companies are optimistic that advanced nuclear resources, including SMR, will contribute to Duke Energy's diverse fleet of resources that rely on a variety of fuel sources, and which help to balance the system to best serve customers.

2. South Carolina law & policy supports the Companies' plans for adding solar resources.

The State policy expressed in Act 236 of 2014, Act 62 of 2019, Act 220 of 2022 and the SC fuel statute all support the addition of solar as included in the Companies' Portfolio P3. While Act 236 advanced the addition of new solar resources through net metering and the facilitation of new solar, Act 62 provided for an evolution of the State's implementation of PURPA, directing the Commission consider

the benefits of longer-duration solar contracts "to promote the state's policy of encouraging renewable energy" while "striv[ing] to reduce the risk placed on the using and consuming public." S.C. Code Ann. § 58-41-20(A), (F)(2). Act 62 also expressed the General Assembly's support for renewable resource additions in utilities' resource mix by:

- Directing the Commission to "ensure that the revenue recovery, cost allocation, and rate design of utilities that it regulates . . . properly reflect changes in the industry as a whole, the benefits of customer renewable energy, energy efficiency, and demand response;"[22]

- Authorized the Commission to create "programs for the competitive procurement of energy and capacity from renewable energy facilities . . . within the utility's balancing authority area;"[23] and

- Required that utilities propose renewable energy programs for consideration by the Commission, noting that the renewable energy facilities "may be located anywhere in the electrical utility's service territory within the utility's balancing authority."[24]

Most recently, Act 220 reinforced the General Assembly's focus on the continued economic development and opportunities for employment in the State by affirming an electrical utility's' ability to incentivize large prospective and current customers to locate, or expand operations, in the State. Act 220 expressly recognized that access to renewable sources for electricity is critical to current and prospective customers' decisions whether to stay or locate to South Carolina, which is consistent with the Companies' firsthand experience with recent economic development projects.

Through these specific and explicit legislative actions, the General Assembly has expressed policy support not only for renewable resources generally, but also recognized the benefits of renewable energy and its competitive procurement.

Planned Solar Can Enhance Grid Reliability and Reduces Fuel Cost Volatility

Renewables like solar can reduce the Companies' reliance on volatile fuel supplies, which is especially important during times of grid stress. Accounting for the recent growth in the Carolinas and the imperative to maintain or improve reliability for our customers, the Companies' Plan must set achievable planning targets for both coal unit retirements and commercial operation dates for equally reliable replacement resources prior to retirements – "replace before retire." Including approximately 17.6 GW of new solar by 2038, Portfolio P3 reflects the Companies' long-term, substantial commitment to resource diversity, customer affordability and protection from commodity price risk as the Companies' Portfolio P3 is designed to meet customers' demands during the ongoing energy transition and changing energy landscape.

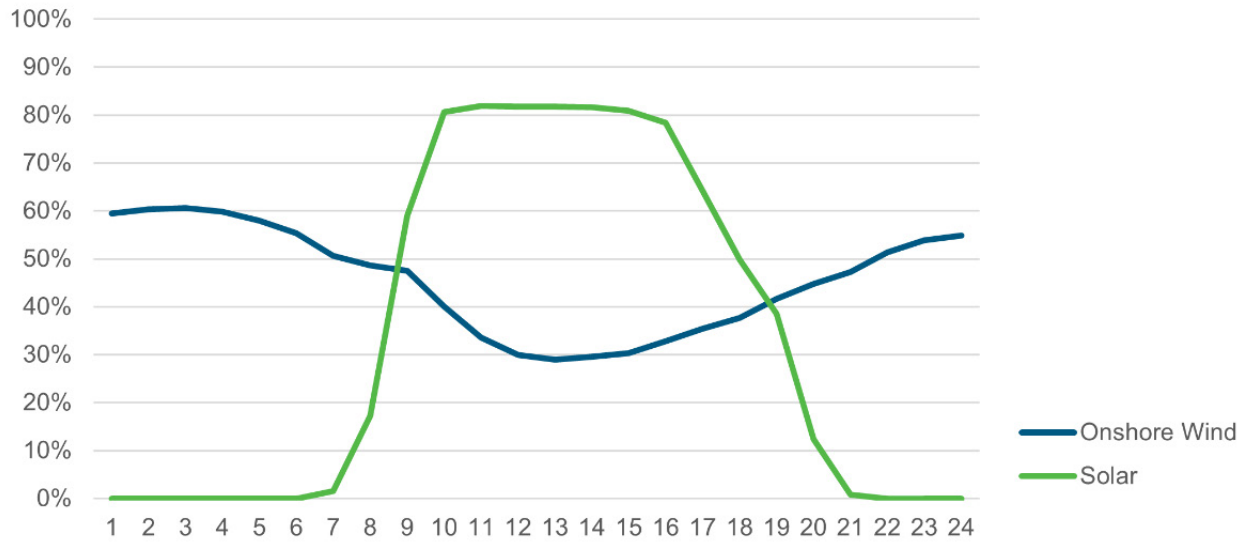
[22] S.C. Code Ann. § 58-41-05

[23] S.C. Code Ann. § 58-41-20(E)(2)

[24] S.C. Code Ann. § 58-41-30

As explained in Appendix I (Renewables and Energy Storage), solar energy is complementary to onshore wind due to different production at different times of day. Figure SC-2 below illustrates the complementary nature of solar and onshore wind energy profiles in the Carolinas where solar generation is high during the day (when onshore wind generation is lower) and the reverse occurs in the evening and early mornings when solar capacity factor is the lowest and onshore wind generation peaks.

Figure SC-2: Solar and Onshore Wind Complementary Energy Profiles



Duke Energy is evaluating multiple types of renewable energy options as a part of a diverse generation mix to serve its customers in a reliable and cost-effective way. A diverse portfolio allows the Companies to withstand a wide array of future conditions including weather-related events. Renewables support fuel cost hedging relative to traditional resources by providing fuel-free energy to the system during varying times and seasons. Inclusion of resources with these operational characteristics in the Plan is consistent with SC's fuel statute. S.C. Code Ann. § 58-27-865 requires that utilities "make every reasonable effort to minimize fuel costs . . . giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service." Resources with these characteristics also provides access to energy at the "lowest practical environmental and economic cost" and encouraging the development and use of clean energy resources as required by S.C. Code Ann. § 48-52-210.

3. South Carolina law & policy supports batteries including solar paired with storage.

Battery storage has been selected as part of Portfolio P3 for meeting customers' capacity and energy needs. Consistent with the IRP statute's balancing factors, batteries will support the Companies' continuing, non-negotiable commitment to providing reliable service. Another aspect supporting the need for battery storage is enhancing the Companies' resource diversity—adding a flexible, dispatchable resource that will improve the system's reliability.

Planned Storage Additions Enhance Operational Flexibility

The benefits of renewable resources are enhanced by the addition of storage, which improves operational flexibility and provides system capacity by facilitating the shifting of energy through time on the system. Adding energy storage systems to solar can increase the availability of solar energy production and decrease the intermittency of solar sites injecting power into the grid. It also helps diversify and complement other types of generation. Rather than generating electricity, storage enables the Companies to flexibly adjust how the system is using energy – charging and discharging in coordination with system needs.

Balancing complementary renewable resources together with energy storage systems, such as battery and pumped storage hydro—discussed below as relevant to Bad Creek—ensures energy is available at times of peak need and help maintain or improve system reliability. Energy storage resources also provide additional ramping and peaking functions that can complement traditional generation, such as combustion turbines.

Energy storage, including batteries paired with solar resources, is expected to play a critical role in ensuring that the Companies cost-effectively meet their system balancing and reliability requirements as they continue to integrate renewables and transition away from aging coal generation. In Chapter 4, the Companies discuss near-term plans for installing approximately 300 MW of standalone (i.e., not installed in connection with a new solar generation facility) battery storage on the system through 2026. The Companies also identify plans for developing a total of 2,700 MW of standalone battery storage, by the beginning of 2031.

The recent passage of the IRA has also improved the economics of standalone energy storage. For the first time, stand-alone energy storage projects not installed in connection with a new solar generation facility can qualify for a 30% investment tax credit, which increases to 40% if sited at a retired coal plant, thereby significantly reducing the cost of energy storage from what it would be otherwise.

Stand-alone energy storage is best operated as part of a diverse resource portfolio. Aside from the technology's ability to avoid curtailment of zero-carbon generation, the responsiveness of energy storage provides flexibility to respond to system imbalances due to unexpected customer load or generation intermittency and contingency.

Pursuing energy storage is wholly consistent with South Carolina law and policy. Energy storage will support the system's resource diversity and protect against commodity price risk – absorbing excess energy to be used later when advantageous for customers. Energy storage, particularly when paired with renewable energy facilities like solar, is also consistent with Act 220's declaration that the availability of renewable energy is important to economic development in this State as it helps to balance renewables on the system and deliver the energy economically to customers. Energy storage is consistent with policy goals described in S.C. Code Ann. § 48-52-210, including (1) ensuring access to energy at the "lowest practical environmental and economic cost"; (2) encouraging the "development and use of clean energy resources, including . . . indigenous, renewable energy resources"; and (3) ensuring that "energy-related decisions promote the economic and environmental well-being of the

State." Energy storage will also support DEC's ability to "minimize fuel costs . . . giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service" as required by S.C. Code Ann. § 58-27-865. Finally, pursuing energy storage as an innovative technology is consistent with the goals of the Governor's Executive Order No. 2023-18, which references "exploring the feasibility of incorporating or incentivizing innovation and technological advances related to energy production,"

4. South Carolina law & policy supports expansion of the Bad Creek Pumped Hydro Storage facility

The Bad Creek pumped hydro storage facility is located at Lake Jocassee in the foothills of the Blue Ridge Mountains in Oconee County, South Carolina. Bad Creek is truly a jewel in Duke Energy's fleet.[25] In service since 1991, Bad Creek is one of only 10 pumped hydro storage facilities over 1,000 MW in the United States. The size and scale were a considerable undertaking – a powerhouse built inside of a hollowed-out mountain that can fit a 25-story building sideways.

The Bad Creek facility has been a significant win for South Carolina's citizens, the environment and customers. As a part of this FERC-licensed facility, Duke Energy built 43 miles of the storied Foothill Trail with a dozen entry points, spur trails to old growth timber, wildflowers, a trout stream, limited access during hunting season, as well as Devil's Fork State Park – developed in cooperation with Duke Energy – which includes cabins, campsites, tent sites and boat ramps.

Once ongoing runner upgrade projects are completed in 2024, Bad Creek will increase the total generating capacity to 1,680 MW. It uses water originating from Bad Creek reservoir, generating power as the water flows through the powerhouse to Lake Jocassee at time of high energy costs. The station can then use low-cost energy from the grid, historically during nights and weekends, to pump water back up to the Bad Creek reservoir from Lake Jocassee. This excess energy used by Bad Creek has historically been from nuclear energy, but increasingly other sources of generation, like solar energy, can also contribute to this storage capability.

With growing demand and a growing number of variable renewable energy resources, which are fuel-free, expanding Bad Creek station by using the existing reservoirs and building a second powerhouse – Bad Creek II – would give the Duke Energy system more flexibility and efficient utilization of low-cost energy. Bad Creek II would increase the plant from four to eight units and increase the station's peak capacity to 3,360 MW – significantly enhancing a proven resource that Duke Energy has successfully operated for decades.

The following information from a Charlotte Business Journal article in 2022 provides a ready description of the Companies intention for expansion at Bad Creek:

> The plan, which is in very early stages, would double …. Bad Creek by building a second powerhouse with four turbines. It would include new caverns carved into Booger Mountain to accommodate new inlets, outlets, large vertical shafts and high-pressure tunnels as well as the underground power complex.

[25] An informational video about Bad Creek is available here: http://badcreekpumpedstorage.com?wvideo= eyxov5p4eo.

> It would not, however, increase the size of the 375-acre Bad Creek Reservoir or the 7,500-acre Lake Jocassee at the site.
>
> Bad Creek operates by pumping water from Lake Jocassee in South Carolina to the 375-acre Bad Creek Reservoir, where the water is stored until needed to produce power during peak usage on the system. It was built in 1991 to use excess power produced at night by the three nuclear plants Duke Carolinas' operated at the time. Nuclear plants cannot be easily turned on and off to follow high demand for electricity during the day and the low demand at night. Using the power they produce overnight to pump water to the upper reservoir to Bad Creek — and an earlier pumped Storage plant Duke built on Jocassee in 1973 — allows Duke to use the reservoirs as batteries to store power that would otherwise be wasted.
>
> There is a similar issue that is becoming more acute as solar and other renewables become more widely used ….. On a bright, sunny afternoon, for instance, solar projects may produce and store more power than Duke can use on its system, particularly as the company adds more solar.[26]

As communicated to the Commission via letter filed in DEC's prior resource planning docket, Docket No. 2019-224-E, on March 4, 2022, DEC made a filing with FERC providing notification of its plan to relicense Bad Creek and seek approval of construction of Bad Creek II.[27] Relicensing Bad Creek will allow the Companies to continue operating their largest renewable energy storage asset for another 40-to-50 years, providing customers an additional 1,680 MW in peak hour capacity of energy storage with no direct fuel costs associated with its generation and providing greater operational flexibility through the absorption and discharge of energy on the system. DEC completed both a pre-feasibility study and a feasibility study for the project and conducted significant stakeholder engagement in furtherance of the project. Specifically, to support a collaborative relicensing process, Duke Energy engaged stakeholders in early 2022 and formed multiple environmental/operations resource committees to develop study methodologies and address environmental impacts associated with the Bad Creek project. Duke Energy continues to engage interested stakeholders through the technical resource committee and public stakeholder meetings with information dissemination as a top priority. In addition, Duke Energy maintains a dedicated relicensing website which provides up-to-date information regarding the ongoing relicensing process.[28] The final FERC application for the expansion project is anticipated to be filed in mid-2025.

Duke Energy is evaluating multiple types of renewable energy and energy storage systems to deploy a diverse generation mix that will help it serve its customers in a reliable and cost-effective way. Increasing energy storage while variable energy resources are also increasing on the system will support operational flexibility and bring value to customers. Bad Creek will continue to be able to store energy from the grid during low demand periods and then generate electricity when demand is high.

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[26] John Downey, Duke Energy eyes doubling pumped-hydro project to store power from expanded solar use, https://www.bizjournals.com/charlotte/news/2022/03/01/duke-energy-eyes-doubling-pumped-hydro-project.html (Mar. 1, 2022).

[27] Bad Creek Pumped Storage Project, FERC Project No. P-2740-053.

[28] www.BadCreekPumpedStorage.com.

Bad Creek is a necessary and complementary resource that will work alongside other renewables to serve Duke Energy customers effectively. Pumped storage hydro is an essential tool in helping balance Duke Energy's system.

The economic benefits of Bad Creek for South Carolinians are extraordinary. The total current economic impact of Bad Creek measures $40 million annually with an associated 98 full time jobs that pay $8 million annually. For every 10 jobs Bad Creek creates, 19 jobs are indirectly created in South Carolina. Between 2027 and 2033, Duke Energy is considering investing more than $5 billion – an investment that would double Bad Creek's capacity by building "Bad Creek II," and raise the total annual economic impact to $75.3 million by 2033. While receiving these significant benefits, assuming traditional cost allocation methodology, South Carolina customers would pay for only about 17% of the capital construction cost of the facility including federal incentives.[29] This opportunity is because of the benefits of the dual state system – due to system allocation, North Carolina customers will receive and pay for most of the output of the facility.

For the reasons described in the preceding section on energy storage, pursuing this expansion at Bad Creek is wholly consistent with South Carolina law and policy. Bad Creek II will support the system's resource diversity and protect against commodity price risk and is consistent with the policy goals of Act 220 and S.C. Code Ann. §§ 48-52-210 and 58-27-865. Further, the development of this resource supports the principals expressed in Executive Order No. 2023-18, protecting and conserving the State's natural and environmental resources. Not only can Bad Creek itself use a renewable resource, it is a great "integrator" which continues to help integrate renewables and nuclear onto the grid given its unique operational characteristics.

5. South Carolina law and policy supports the exploration of onshore wind, although we acknowledge siting will entail significant stakeholder and local engagement.

The Companies are expecting to develop and execute onshore wind capacity over the next decade through 2038, the end of the Base Planning Period for this Resource Plan. Portfolio P3 would add 2,250 MW of onshore wind by 2038, and, of that, 1,200 MW of onshore wind is targeted to be online by the beginning of 2033. The Companies anticipate siting onshore wind facilities across both North Carolina and South Carolina. While Duke Energy and local stakeholders in South Carolina are relative newcomers to onshore wind as a material energy resource, South Carolina has numerous areas where wind energy could be incorporated into the grid as a beneficial resource if determined to be in the public interest.

Currently Duke Energy doesn't have any onshore wind generation installed in the Carolinas, but the U.S. market continues to grow with approximately 146 GW of onshore wind operational nationwide and approximately 40 GW coming online in the last three years.[30] To meet customers energy needs,

[29] Joseph Von Nessen, Ph.D., *The Economic Impact of the Bad Creek Hydroelectric Station Expansion (2023 Update)* (Aug. 2023).

[30] American Clean Power Association | Clean Power Quarterly Mark Report 2023 Q1.

the Companies are expecting to develop and execute new onshore wind capacity over the next decade.

Onshore wind resources, while spanning large land areas, allow land in between and around the turbines to still be used for other purposes, such as farming, forestry or other development, helping maximum land use efficiency while incorporating fuel-free, renewable energy onto the grid. Duke Energy understands that wind energy projects will require extensive stakeholder engagement to site, develop, construct and operate facilities in the Carolinas, and is keenly aware that there are numerous hurdles that contribute to siting wind projects. These include suitable wind speeds, current aviation and military uses in and around a potential site, environmental impacts, community engagement and other related considerations. Duke Energy has conducted a siting feasibility study to understand the potential for favorable onshore wind locations within the Carolinas and plans to either self-develop projects or partner with an onshore wind developer.

Pursuing onshore wind is consistent with South Carolina law and policy. First, onshore wind—as a selected resource in Portfolio P3—contributes a cost-effective portfolio of diverse resources, contributing to reliable operations and mitigating commodity price risk, all of which is consistent with the balancing factors included in the IRP statute. Onshore wind also supports the economic development goals of Act 220, providing a source of renewable energy, helping to attract new business to the State and encouraging the expansion of existing operations. Onshore wind is also supported by Executive Order No. 2023-18, which references "exploring the feasibility of incorporating or incentivizing innovation and technological advances related to energy production and addressing the existing limitations on the State's ability to receive and capability to utilize natural gas . . . ." Exploring onshore wind and working through a stakeholder process for potential sites is also consistent with the general activities of the State Economic Development and Utility Modernization Committee recognition of the renewable energy demands of businesses that contribute to the economic development of the state. S.C. Code Ann. § 48-52-210 provides that "[i]t is the policy of this State to have a comprehensive state energy plan that "encourages the "development and use of clean energy resources." South Carolina law also requires electric utilities to "make every reasonable effort to minimize fuel costs . . . giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service," and additional sources of fuel-free energy helps to mitigate fuel costs. SC Fuel State, S.C. Code Ann. § 58-27-865.

In pursuing onshore wind, as it does with all projects, the Companies intend to proceed carefully and with robust stakeholder engagement to explore and advance siting of these types of facilities. With onshore wind currently planned to be in service by 2031 in Portfolio P3, the cadence of Resource Plans will allow us to check and adjust as we continue to evaluate and explore this resource.

6. South Carolina law and policy supports natural gas generation, including new hydrogen capable plants.

Portfolio P3 Reflects Existing and New Natural Gas Resources' Critical Reliability Role in Energy Transition

With the inclusion of over 7,000 MW in new natural gas resources by 2038 (4,080 MW of CCs and 2,975 MW of CTs), Portfolio P3 reflects the need for dispatchable natural gas-fueled resources. In fact, natural gas resources are needed under all portfolios to retire coal, reliably integrate renewables and maintain system reliability. The Companies' plan for dispatchable, new hydrogen-capable natural gas resources enables the Companies to achieve commercial operation of additional natural gas resources by 2029, with additional CC and CT capacity planned for 2030 and through the early 2030s. These resources are in addition to DEC taking care, custody and control of Lincoln CT17, the largest single CT in the world[31], in 2024. The project is a collaboration with Siemens Energy to bring online an industry leading advanced-class hydrogen-capable gas turbine technology.

The Companies are currently finalizing CPCN Applications for authorization to construct hydrogen-enabled gas assets (approximately 900 MW CTs at Marshall station located in Terrell, North Carolina and 1,360 MW CC at Person County Energy complex located in Semora, North Carolina), both of which are consistent with past IRPs filed with the PSCSC. Based on the anticipated availability of natural gas supply, Portfolio P3 selects the maximum amount of natural gas resources the Companies can build and maintain an adequate fuel supply.

The Companies are keenly aware of the critical role natural gas continues to play to provide reliable electricity to customers. Notwithstanding, the Companies understand the risk of relying too heavily on any one resource type and are mitigating this risk through investments in a diverse generation fleet. This diversity enables the Companies to balance resource adequacy, affordability, compliance with applicable regulations, reliability, commodity price risk, resource diversity, and other foreseeable conditions, as required by Act 62. Gas resources serve as a critical reliability bridge and an enabler of the energy transition. Increasing levels of variable-energy resources, such as solar and wind, and energy-limited storage increase the complexity and impact the predictability of grid operations – and change the nature and management of extreme cold weather risks. As coal units are retired and the integration of renewable resources increases, the flexibility of dispatchable gas-fired resources becomes an increasingly important resource for maintaining system reliability in a least-cost manner. Today, the Companies' gas-fired generation fleet consists of 55 CTs, 9 CC units, and 1 combined heat and power unit, having a combined total winter capacity of 11,891 MW. Furthermore, 8 of the remaining 15 coal units on the system are able to co-fire on natural gas, increasing the flexibility of these units to provide a reliable integration of renewables and utilizing dispatch on the most cost-effective fuel given volatility in fuel prices. Gas and renewables are complementary to the energy transition, with dispatchable gas providing an essential reliability role at scale when the sun is not shining and the wind is not blowing.

[31] Siemens Energy and Duke Energy's gas power plant achieves GUINNESS WORLD RECORDS™ title | Duke Energy | News Center (duke-energy.com).

The Commission approved a resource plan in the previous South Carolina resource planning proceeding with substantial amounts of new natural gas resources over the 15-year planning horizon, but also directed the Companies to "address the risks of natural gas transportation and delivery, including rejection [or] cancellation of pipeline projects" in their next resource plans. The Companies are de-risking their reliance on natural gas through a combination of methods, including pursuing a balanced procurement strategy through increasing access to natural gas from both Appalachian and Gulf Coast gas supply markets, exploring increased on-site fuel storage, and ensuring that newly constructed natural gas plants are hydrogen-capable. While recent federal action makes completion of the Mountain Valley Pipeline more certain, newly proposed rules under Section 111 of the Clean Air Act could also impact existing and new natural gas-firing power plants. Designing these units to be hydrogen-capable maximizes value for customers over the full life of the plants. These matters are discussed in more detail in Appendix K (Natural Gas, Low-Carbon Fuels and Hydrogen).

The Companies have been actively evaluating and planning for clean hydrogen production and utilization. Currently, all of the Companies' major combustion turbines, in both simple cycle and combined cycle configurations, are capable of firing varying blends of hydrogen. These existing units would however require modifications / upgrades to effectively utilize those hydrogen blends.

To increase the flexibility of the existing gas-fired fleet, the Companies will need to equip a number of its CC/CT stations to support more flexible operational capabilities, such as lower load operations, increased ramp rates and the ability to cycle more often to respond to increased variability in the output of renewable resources. In the near and intermediate term, the Companies will plan and implement gas unit control upgrades and equipment changes and seek regulatory approvals for operational and air permit changes. In addition to increased flexibility, the proposed projects also come with additional much-needed dispatchable capacities.

7. South Carolina law and policy supports EE and DSM

With substantial and increasing economic growth in the Carolinas, EE and DSM will continue to be areas of focus for the Companies as they seek to "shrink the challenge" of meeting customers' growing electricity needs. As further explained in Appendix H (Grid Edge and Customer Programs), the Companies' Plans include an evaluation of low, medium and high cases for the adoption of EE and demand response measures, as required by Act 62.[32] The statute setting forth resource planning requirements in South Carolina, Act 449 of 1992, recognized the importance of energy to the state's economic well-being and provided for the Commission's adoption of energy efficiency procedures to incentivize utilities to invest in energy efficiency and conservation programs.[33]

As this Commission is well-aware, the Companies ensure its customers have a reasonable opportunity to employ energy and cost saving measure, like energy efficiency[34] and are on the leading edge for EE/DSM programs and savings that benefit all of our customers. As shown in the below Figure SC-3,

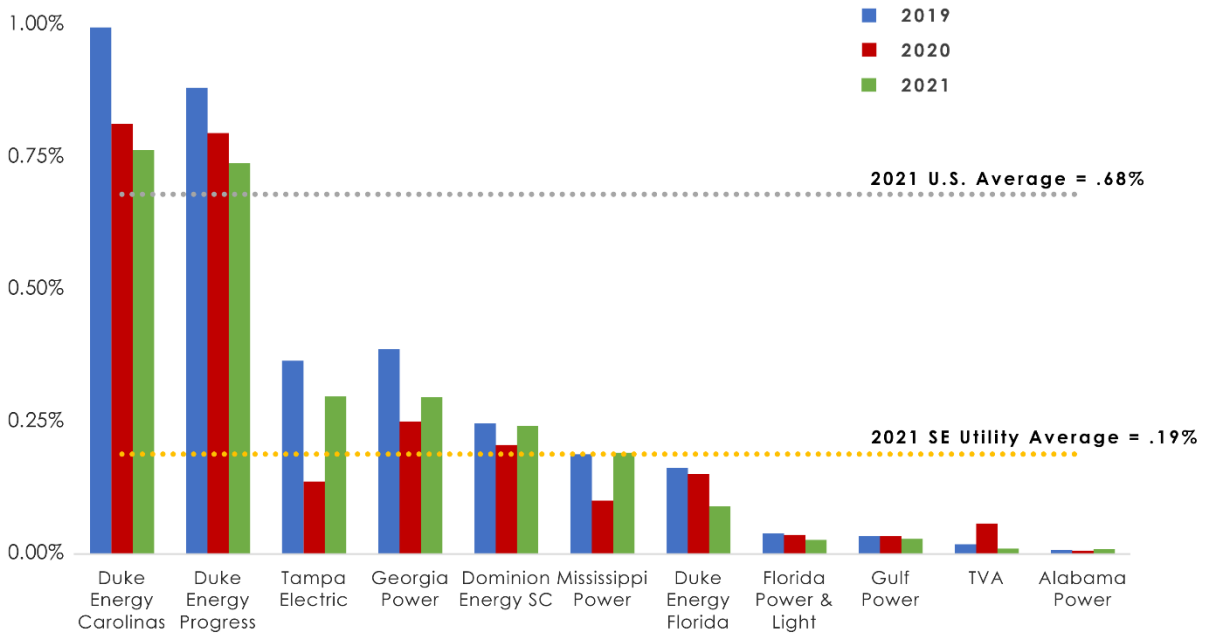
[32] S.C. Code Ann. § 58-37--40(B)(1)(e).

[33] Now codified at S.C. Code Ann. § 58-37-20.

[34] S.C. Code Ann. § 58-27-845(B).

the Companies' EE programs delivered well over three times the annual savings of the national average.

Figure SC-3: Efficiency Performance of Major Southeastern Utilities[35]



The Companies' continued inclusion of its successful EE/DSM programs in its resource planning is therefore reasonable, prudent and supported by SC law and policy.

8. *South Carolina law and policy supports an orderly exit from coal generation as seen in the Companies' coal plant retirement schedules, as well as our plans to mitigate risks associated with the deteriorating coal supply chain.*

As explained in Chapter 1 (Planning for a Changing Energy Landscape) and Appendix F, continued reliance on coal-fired generation presents increasing risks to customers. Coal is becoming increasingly harder to source, supply, transport and predict price, and coal generation is becoming increasingly difficult to maintain. We also have experienced steep swings in the commodity cost of coal, which contributes to volatility and additional fuel costs borne by customers. For example, DEC saw a 41% increase in its delivered cost of coal per ton for the period between June 1, 2022 through May 31, 2023,[36] and DEP—from March 2021 through February 2022—saw an increase of approximately 12% in the average delivered cost of coal per ton as compared to the prior twelve months.[37]

[35] Southern Alliance for Clean Energy, Energy Efficiency in the Southeast: Fifth Annual Report (Mar. 2023), available at https://cleanenergy.org/wp-content/uploads/Energy-Efficiency-in-the-Southeast-Fifth-Annual-Report.pdf.
[36] DEP Witness James J. McClay, III's Direct Testimony in Docket No. 2023-3-E.
[37] DEP Witness James J. McClay, III's Direct Testimony in Docket No. 2023-1-E.

As most utilities in the country move away from coal generation, it naturally causes degradation in the supply chain. This degradation is well underway. Earlier this year, the Institute for Energy Economics and Financial Analysis reported that the United States is on track to retire half of its coal capacity by 2026.[38] This tracking is consistent with recent activity among utilities operating within the Southeast region. We see this occurring in South Carolina as well—all utilities in South Carolina are preparing an exit from coal generation. For example, Santee Cooper plans to retire the 1,150 MW Winyah coal plant by year-end 2030 and Dominion SC plans to retire its Wateree and Williams Stations totaling 1,294 MW by ear-end 2028 and 2030, respectively.[39]

That said, reliability remains paramount. With positive economic development growth reflecting the Carolinas as an increasingly attractive location for industry, the Companies employ a thorough and deliberate approach to implementing retirement decisions. Between now and the time the coal units retire, each unit must be properly maintained to provide dependable duty to ensure we have "iron in the ground" across South Carolina and North Carolina to meet new and existing load.

Executing on these coal unit retirements must be coordinated with the development of replacement resources, their fuel supply, where applicable, and transmission system improvements to maintain resource adequacy and reliability for customers.

The Companies' coal retirement schedule and Portfolio P3 are consistent with South Carolina law and policy. For example, the South Carolina fuel cost recovery statute—S.C. Code Ann. § 58-27-865—requires electric utilities to "make every reasonable effort to minimize fuel costs . . . giving due regard to reliability of service, economical generation mix, generating experience of comparable facilities, and minimization of the total cost of providing service." Moving away from coal generation over time is representative of the Companies' efforts "to minimize fuel costs" by avoiding the coal price volatility, as well as adding additional solar generation to displace energy from coal units given that renewables are fuel-free energy. The fact that the Companies are moving at a prudent and deliberate pace for such retirements, with a focus on replacement and incremental resources, demonstrates the Companies have appropriate "regard to reliability of service."

The energy landscape is rapidly changing just as the Companies' energy transition reaches a critical inflection period with robust and significant economic development and anticipated load growth while retiring the remaining coal-fired generation by the end of 2035.[40] During this period of coal retirement, the Companies must bring into service a set of diverse resources to keep pace and accommodate the growth needs of the states' businesses and economies while striving to maintain or improve the reliability of the grid around the clock, including during extreme weather events. Executing on these coal unit retirements must be coordinated with the development of replacement resources, their fuel

[38] U.S. on track to close half of coal capacity by 2026 | IEEFA.

[39] South Carolina Public Service Authority/Santee Cooper 2023 Integrated Resource Plan (Docket No. 2023-154-E) and Dominion Energy South Carolina's 2023 Integrated Resource Plan (Docket No. 2023-9-E).

[40] Cliffside 6 is shown as retiring in 2048 and is assumed to cease coal operations and operate on natural gas by the beginning of 2036.

supply, where applicable, and transmission system improvements to maintain resource adequacy and reliability for customers.

A resource retirement and build cycle of this magnitude has not been undertaken in recent history. Successful execution of Portfolio 3 requires decisive near-term actions, supporting development and investment in the intermediate-term, and retaining flexibility to meet evolving conditions in the long-term. Effective Plan execution allows South Carolina to grow, invest and flourish for decades to come.

9. *South Carolina law and policy supports using the assets discussed above to meet load growth and supporting economic development, including helping to meet customers' sustainability goals which include emissions reduction and access to renewables.*

The creation of the State Economic Development and Utility Modernization Committee—with the aims of utility modernization, workforce development and infrastructure investment designed to attract industry—includes a focus on the renewable energy demands of businesses that contribute to the economic development of the state, noting that industries looking to locate in South Carolina are requiring clean energy options. Portfolio P3 supports these goals by giving large customers' options to meet their energy requirements from renewable resources that are locally sourced on system in the Carolinas and competitively priced. Likewise, the State Energy Plan's focus on the State's natural resources, economic development and carbon-free (including nuclear) resource development is aligned with the Companies' Portfolio P3, which seeks to responsibly transition away from coal over time and towards resources that both attract new businesses to South Carolina and support current Duke Energy customers.

A number of South Carolina customers have set clean energy goals that align with Duke Energy's efforts to reduce carbon emissions. For example Clemson University's Sustainability Action Plan has an ultimate "net-zero goal" of making the University carbon free by 2030.[41] Milliken General Counsel Kasel Knight similarly announced "Milliken commits to reaching real net-zero greenhouse gas emissions across the value chain by 2050 from a 2018 base year."[42] BMW, who recently announced an expansion in the South Carolina Upstate, also has a 2030 goal of avoiding emissions amounting to 20 times the annual CO_2 emissions of a city with one million inhabitants.[43] BMW has also announced it expects their vendors to use 100% renewable energy.[44] Michelin, citing their customers' changing expectations are balancing growth in South Carolina with their 2050 net-zero emissions goal.[45] Nucor,

[41] www.Clemson.edu/sustainability/.
[42] Milliken & Co. Commits to Net-Zero Future, available at https://www.milliken.com/en-us/news/milliken-commits-to-net-zero-future.
[43] Over 200 Million tonnes: BMW Group sets ambitious goal to reduce CO_2 emissions by 2030, BMW Global Press Club Global, available at https://www.press.bmwgroup.com/global/article/detail/T0332273EN/over-200-million-tonnes:-bmw-group-sets-ambitious-goal-to-reduce-co2-emissions-by-2030.
[44] The BMW Group:100% Electrified, available at https://businessplus.ie/motoring/the-bmw-group-100-electrified/.
[45] Acting for the Climate, available at https://www.michelin.com/en/sustainable-development-mobility/for-the-planet/acting-for-the-climate/.

also a key stakeholder and employer in South Carolina, committed to a 35% reduction in greenhouse gas intensity by 2030 – more than 77% less than the steel industry's average today.[46]

Accordingly, not only is the Companies' Portfolio P3 the most reasonable, least cost plan to achieve energy transition, reducing carbon emissions in the electricity supply and providing cleaner options—including renewables--is in step with the overall business community in South Carolinas as well as SC law and policy. For example, Act 220 and the Governor's Executive Orders both recognize the importance of energy in attracting and retaining business in South Carolina as described above.

10. South Carolina law and policy supports planning for reliability and resilience.

Portfolio P3 helps ensure adequacy and will help maintain reliability, particularly in extreme cold, as energy needs continue to grow. Planning and delivering reliable electric supply is foundational for the vitality and economic development of customers, businesses and communities. The Companies must preserve reliability by controlling the pace and composition of the energy transition, ensuring that adequate dispatchable capacity and energy supply is available prior to retiring coal units.

Experience has shown that resource diversity and reliability are directly interrelated. Indeed, SERC—the entity responsible for overseeing grid reliability in the Southeast—has repeatedly asserted that a diverse resource mix is needed to reliably supply electricity.[47] Indeed, in the allowable ex parte briefing SERC delivered to the Commission on July 12, 2023, representatives from SERC likened resources to players in different positions on a baseball diamond, and noted that diversity of resources is vitally important to reliability:

> SERC is resource-agnostic as of what resources are part of the power system. We just want all of them to contribute to the success of the power system. Just as in baseball, we do not want nine pitchers on the field or nine first basemen. Similarly, we do not want power generators with just one attribute to be powering — to be part of the power generation[]. We want certain types of reliability services on the grid, in order — we've got to vary several different kinds of resources in order to support reliability. So there are different types of attributes that we are looking for different generators.[48]

At the end of the day, customers first and foremost demand reliability in their electricity supply. The Companies' focus on reliability as provided for in Portfolio P3 is consistent with and responsive to recent South Carolina policy. As recently affirmed by SERC before the Commission in the ex parte

[46] Nucor Sustainability and Environmental Commitments, available at Nucor | Nucor Sustainability and Environmental Commitments.

[47] SERC, 2022-2023 Probability Assessment for Resource Adequacy Report at 32, available at https://www.serc1.org/docs/default-source/committee/resource-adequacy-working-group/2022-2023-serc-probabilistic-assessment-for-resource-adequacy.pdf ("Ensure a diverse resource mix is available to respond to normal and emergency conditions, including extreme weather."); SERC, 2023 SERC Summer Reliability Assessment Report at 4, https://www.serc1.org/docs/default-source/program-areas/reliability-assessment/reliability-assessments/2023-serc-regional-summer-assessment_clean_final.pdf ("Reliability is supported by a diverse fuel mix . . . .").

[48] SERC Reliability Corporation, Allowable Ex Parte Briefing Transcript at 24-25, Docket No. ND-2023-33-E (July 14, 2023).

briefing, utilities must have a reasonably balanced, diverse set of resources to reliably meet customer demand.

Closing and Summary of Requests to Commission

As described throughout this SC Chapter and the rest of the Resource Plan, Portfolio P3 is the most reasonable, least cost resource pathway identified by the Companies, and supports an executable plan to successfully navigate and build upon the growth being experienced in the Carolinas in a manner that (1) minimizes risk; (2) prioritizes reliability and affordability; (3) includes a diverse, generation mix ranging from fuel-free renewables, innovative new resources and dispatchable generation; (4) provides for an orderly exit from coal generation; (5) helps customers meet their sustainability goals, which is important for South Carolina's economy; and (6) complies with applicable SC law and policy.

Certainly, no one can predict the future that the next 15 years will bring—but we can plan for it. To the extent new technologies mature or bring challenges which cannot be resolved, the PSCSC can revisit the long-term plans as the energy transition progresses, every three years at a minimum, with annual updates being made by the Companies in between filings; however it is imperative that the Companies exit this IRP proceeding with a Commission order that provides a clear understanding that the actions we are undertaking in the near term are consistent with the public interest of South Carolina and supported by the Commission as the most reasonable and prudent plan to serve our customers future energy and capacity needs.