INTEGRATED RESOURCE PLAN

2024 UPDATE

Dominion Energy South Carolina, Inc.

March 28, 2024

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I. INTRODUCTION

The South Carolina integrated resource planning statute (the "IRP Statute[1]") requires utilities to update their integrated resource plans ("IRPs") annually. This report (the "2024 IRP Update") updates Dominion Energy South Carolina, Inc.'s ("DESC's") triennial 2023 Integrated Resource Plan (the "2023 IRP") which it filed with the Public Service Commission of South Carolina (the "Commission") on January 30, 2023, and which was accepted by the Commission in its Order No. 2023-860(A). In this report, DESC refreshes the analysis provided in the 2023 IRP – which was based on data available in late 2022 – and reviews its generation planning in light of recent developments in energy markets and the emerging needs of its service territory and the State of South Carolina.

II. EXECUTIVE SUMMARY

A. Load Growth and Economic Growth

In 2023, the State of South Carolina continued to achieve remarkable success in attracting major new economic development projects, and two projects alone are estimated to add 256 megawatts ("MW") of load to DESC's system by 2032. This represents an approximately 4.8% increase in demand that was not included in the 2023 IRP demand forecasts. In addition, in 2023, the U.S. Census Bureau identified South Carolina as the fastest growing state in the nation in terms of percent growth in population. DESC expects its customers' energy demands to continue to grow as new jobs and industry attract new residents and supporting businesses to South Carolina. This 2024 IRP Update incorporates these new loads and load growth forecasts in its modeling.

[1] S.C. Code Ann. Section 58-37-40.

B. Legislative Focus on the Need to Expand and Modernize South Carolina's Electric Grid

In 2023, the South Carolina General Assembly prioritized the State's expanding energy needs as a matter of public policy requiring immediate action. The Speaker of the House of Representatives convened an Ad Hoc Committee on Economic Development and Utility Modernization, which along with other legislative committees, has been charged among other things with exploring initiatives to create a secure pathway for electric utilities to modernize and expand their generation fleets and replace aging coal-fired plants with new and lower emitting resources.

Included in legislation currently under consideration is a legislative recognition of the benefits to the State from DESC and the South Carolina Public Service Authority ("Santee Cooper") jointly building a high-efficiency, modern, and operationally flexible natural gas-fired combined cycle unit ("NGCC") at the site of DESC's former Canadys Station approximately forty miles north of Charleston. DESC and Santee Cooper have been developing this asset (the "Joint Resource") under the framework of a Memorandum of Understanding executed in 2022.

Policymakers have also identified the synergies between electric generation and natural gas supply and recognize that the Joint Resource can provide the opportunity for expanding access to natural gas in underserved regions of the State which have an urgent need for access to firm natural gas service to support continued economic development.

C. The Joint Resource and Wateree and Williams Replacement

The modeling presented in this 2024 IRP Update reaffirms the conclusion reached in the 2023 IRP that the primary solution to replacing DESC's coal-fired capacity at Wateree Station ("Wateree") and A. M. Williams Station ("Williams") is through the construction of the Joint

Resource or a similar NGCC resource at the Canadys site. The modeling done in preparing this 2024 IRP Update selected the Joint Resource – in either a 662 MW or 1,325 MW configuration – in each of the twelve build plans ("Build Plans") considered, including the two most highly carbon-constrained Build Plans (the Proposed GHG Rule Build Plan and the 85% Carbon Reduction Build Plan) and the Build Plan that assumed the highest future cost of natural gas commodity (the High Fossil Fuel Prices Build Plan). All twelve Build Plans include significant additions of solar resources ("Solar") and battery energy storage ("Battery") capacity which the Joint Resource supports by providing operational flexibility and dispatchable power that these intermittent and energy-limited resources require.

In addition, developing the Joint Resource supports Santee Cooper achieving its goal of retiring its coal-fired Winyah Generating Station ("Winyah"), which is located near Georgetown, South Carolina, and creates the opportunity for economies of scale, reduced costs to customers, increased fuel efficiency and greater operating flexibility for all participating utilities. The Joint Resource would also anchor an expansion of natural gas supplies in the South Carolina Low Country where economic development is increasingly limited by lack of access to such supplies.

The Joint Resource will be sited on an existing brownfield electric generating site where the electric transmission upgrades and natural gas pipeline expansions required to support it are anticipated to be able to follow existing rights of way corridors, all of which will minimize the environmental footprint of replacing coal generation and expanding natural gas pipelines to serve coastal South Carolina.

D. Uncertainties Concerning the Wateree and Williams Retirement Dates

DESC's commitment to maintain reliability[2] for its customers is non-negotiable. Neither Williams nor Wateree can be retired until reliable, dispatchable replacement generation is built along with the required transmission and fuel supply assets needed to support it. For this reason, as stated in the 2023 IRP, the 2022 Coal Plants Retirement Study and other DESC filings, DESC can only achieve the current retirement dates of 2028 for Wateree and 2030 for Williams if it can confidently assume that the required generation, transmission, and fuel supply resources will be built and operational when needed. This assumption is subject to risk factors which include, but are not limited to:

- Higher than anticipated customer load growth which now requires more generation to be added to support the planned Wateree and Williams retirements;
- The need to complete the all-sources request for proposals ("RFP") to replace certain peaking and steam units being retired at Urquhart Station, which as a practical matter must be constructively concluded before an RFP for replacement capacity to support Wateree can be issued; and
- The potential for regulatory, procurement, or construction delays that could change the schedule for completing the required generation, transmission or fuel supply resources needed to replace Williams and Wateree.

[2] As explained in the Reserve Margin Study, DESC applies a well-recognized industry reliability standard in planning its generation system which requires the generation plan to provide sufficient capacity to meet customers' demands even during extreme high-load conditions with the probability of generation-related loss of load events (*i.e.*, system outages) occurring no more than one day every ten years.

Since the 2023 IRP was filed, the pathway to achieving the current retirement plan for these units has become narrower and more difficult. Specifically, the greatest schedule risks to the current retirement plans lies in the time required to design, site, and permit the electric transmission lines needed to support retirement of Wateree and Williams, and the time required for the pipeline expansion projects to provide natural gas supplies for replacement generation. To be clear, DESC is not changing its plan to retire Wateree in 2028 and Williams in 2030. Those planned retirement dates are assumed in twenty of the twenty-two Build Plans presented here. But it must be acknowledged that the ability to achieve those dates has become increasingly challenging since the 2023 IRP.

E. Replacing Wateree Capacity

The 2024 IRP Update identifies multiple approaches for replacing Wateree, if possible, by December 31, 2028. The Updated 2023 Reference Build Plan included in this 2024 IRP Update is based on the Reference Build Plan that was selected as the preferred plan in the 2023 IRP. In keeping with that plan, it locks in 400 MW of four-hour Battery in 2029 as the principal capacity resource to replace Wateree, and the Joint Resource to replace Williams in 2031. To meet the additional 256 MW of new economic development load identified since 2023, the Updated 2023 Reference Build Plan adds a 201 MW large capacity simple-cycle frame combustion turbine ("Frame CT") in 2029 as well.

The 2024 Reference Build Plan, on the other hand, is a full refresh of the 2023 Reference Build Pan. In preparing it, the model was free to optimize a new plan using the updated 2024 load growth, fuel cost, build costs and other inputs without any of the resource selections identified in the 2023 IRP being locked in. That modeling shows that under current load conditions and cost forecasts, the Battery resource identified in the 2023 IRP is no longer the best approach to replacing

Wateree. Instead, the optimum replacement strategy for Wateree would include two 201 MW Frame CTs added in 2029, followed by 300 MW of Battery added in three stages from 2029-2032, followed by construction of the Joint Resource.

No later than December 31, 2025, DESC must make a binding commitment to retire Wateree by December 31, 2028, or it must commit to undertake upgrades to meet the currently effective Steam Electric Effluent Limitation Guidelines ("ELGs") Voluntary Incentive Program ("VIP") wastewater treatment requirements. Replacing the Wateree capacity (684 MW) is critically necessary for DESC to maintain system reliability, and DESC cannot proceed with the Wateree retirement unless it has reasonable assurances that it can acquire suitable replacement resources in time. If DESC decides not to proceed with ELG upgrades at Wateree, it may be forced to close the unit in 2028 regardless of whether replacement resources are available, and this could put at risk DESC's ability to serve customers reliably in extreme weather conditions or when major generation or distribution assets are offline.

If Wateree is not to be retired by December 31, 2028, then DESC must move quickly to bring it into compliance with the VIP requirements. To protect its options and ensure reliable service to its customers, DESC is proceeding with the initial steps towards complying with the VIP requirements at Wateree. As the December 31, 2025, commitment date approaches, DESC will continue to assess its options and the timetable for putting Wateree replacement capacity in service.

F. Replacing Williams Capacity

Williams is a "must-run" unit that provides more than 80% of DESC's installed generating capacity in the Charleston area and is critical to providing reliable service to customers there. The analysis contained in this 2024 IRP Update consistently shows that the optimal replacement for

Williams is the Joint Resource to be built in partnership with Santee Cooper and constructed at the Canadys site.

DESC is moving forward with ELG compliance at Williams to allow it to provide capacity to the system past December 31, 2025, which is the compliance deadline for the technology pathway selected for that plant. Completion of ELG compliance projects at Williams will allow the unit to remain in service until suitable replacement resources are operationally available. This investment greatly reduces the schedule and reliability risks associated with the Williams retirement and is reasonable considering the unavoidable complexity of replacing such an important resource in an extremely generation-limited part of DESC's service territory.

G. The Hypothetical Retirement Dates - 2032/2034 Build Plan

To quantify the impact of potential delays in the Wateree and Williams retirement and replacement plans, DESC modeled the build plan that would be required if the Wateree and Williams retirements are not able to be achieved until 2032 and 2034, respectively.

As a hypothetical case, the Retirements - 2032/2034 Build Plan demonstrates that if the retirement dates for Wateree and Williams are delayed as indicated, the increase in levelized net present value costs to customers compared to the 2024 Reference Build Plan is 0.5% annually. This largely reflects the forecasted costs of the ELG upgrades at Wateree, indicating that the cost to customers of not achieving the current retirement dates is not excessive. Moving the retirement date of Wateree to 2032 also allows the model to select the Joint Resource when Wateree is retired, so that it directly supports the replacement of both Wateree first and then Williams, creating more value to customers from the addition of this unit.

The Retirements - 2032/2034 Build Plan is merely hypothetical and including it in the 2024 IRP Update does not mean that DESC has changed its stated goal to achieve the 2028 and 2030

retirement dates for Wateree and Williams, respectively. But evaluating the Retirements - 2032/2034 Build Plan allows DESC, and all interested stakeholders, to better understand the risks if its current retirement plans are delayed and to identify the actions that would be required to reduce costs and protect reliability if that contingency were to occur.

H. Modeling and Methodology

In preparing this 2024 IRP Update, DESC used the same modeling methods and evaluation metrics it used in the 2023 IRP but refreshed the analysis with current forecasts of customer load growth, fuel costs, generation technology costs and other inputs. This 2024 IRP Update also models, for the first time, the potential use of green hydrogen as a low-greenhouse gas intensity fuel to supplement natural gas in future NGCC and combustion turbine ("CT") applications.

I. Revised and Expanded Build Plans

Along with updated forecasts and other inputs, this 2024 IRP Update provides a revised and expanded set of build plans and sensitivities which include:

- An updated version of the Reference Plan from the 2023 IRP (the "Updated 2023 Reference Build Plan") with sufficient resources added through optimization to meet new and higher customer load forecasts;
- A newly optimized 2024 Reference Build Plan;
- A new sensitivity case to evaluate a build plan to comply with the preliminary version of the Environmental Protection Agency's ("EPA's") proposed greenhouse gas rule for fossil

fuel fired electric generation units (the "GHG Rule");[3]

- A new sensitivity case to determine the changes in build plans and resulting costs if DESC is unable to meet its current goal to retire Wateree by 2028 and Williams by 2030.

DESC also included an updated analysis of the 85% Carbon Reduction Build Plan in this analysis but removed the 70% Carbon Reduction Build Plan in the interest of both reducing the growth in the total number of build plans presented here, and in recognition that, compared to the 70% Carbon Reduction Build Plan, the Proposed GHG Rule Build Plan provides a similar but slightly smaller reduction of 64% in 2050 CO_2 emissions.

J. Results of the Modeling

In the updated modeling, the fully optimized 2024 Reference Build Plan outperformed the Updated 2023 Reference Build Plan by a significant margin across multiple metrics. It had the lowest or the second lowest cost to customers across the fifteen Core Market Cases, demonstrating that it is a robust plan that performs well under divergent sets of market conditions. The carbon constrained Build Plans (the 85% Carbon Reduction Build Plan and the Proposed GHG Rule Build Plan) created the greatest reduction in carbon emissions by 2050 but did so at higher costs in the majority of cases. These Build Plans yielded higher costs under certain market conditions and provided less generation diversity than the other Build Plans.

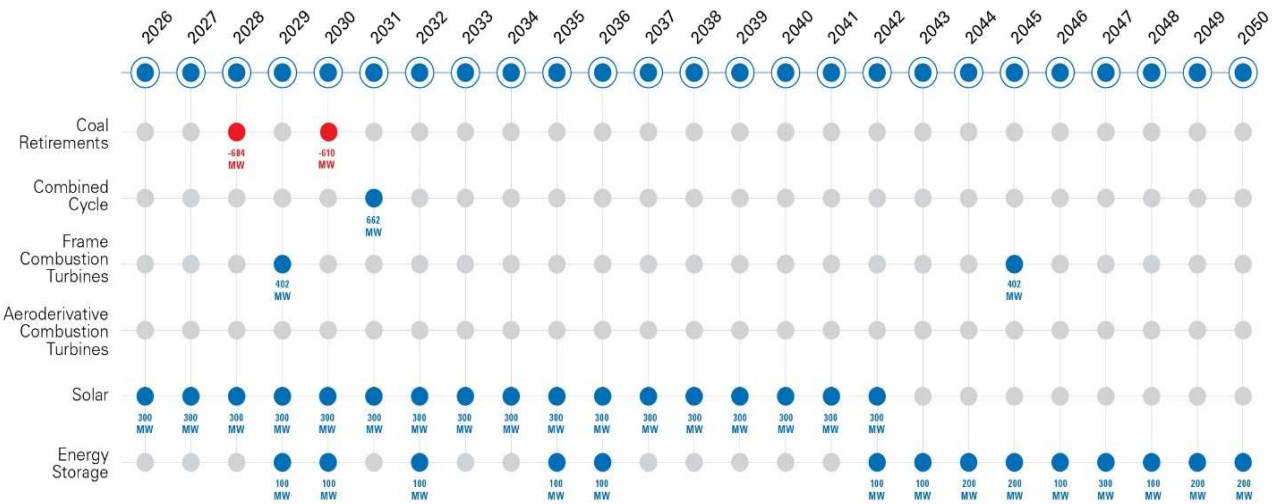
The modeling showed that while complying with the proposed GHG Rule would result in higher costs for customers, it would only reduce 2050 CO_2 emissions by an additional increment

[3] Events have already overtaken the modeling assumption related to the GHG rule: On February 29, 2024, the EPA Administrator announced to Congress that the agency would make major modifications to the proposed rule to exclude existing gas-fired combustion turbine generation resources from its initial scope. However, the Proposed GHG Rule Build Plan submitted here is useful as a planning exercise since it represents a conservatively stringent 'book end' analysis of the potential costs and resulting build plans that could be required to comply with future GHG rules.

of 8% relative to the 2024 Reference Plan and would not fundamentally change the choice of the primary resources needed to replace Wateree and Williams, which are a combination of the Joint Resource, Frame CTs, Battery and Solar. Delaying the retirement of Wateree and Williams by four years resulted in the Joint Resource being added at the time of the Wateree retirement, not Williams, and the Frame CT resources that were associated with the Wateree retirement in other plans would be installed to coincide with the Williams retirement.

Based on the updated inputs and modeling results, and careful consideration of the needs of the system, DESC selected the 2024 Reference Build Plan as its preferred plan to guide its planning decisions at the present time.

Figure 1. Resource Additions under the Preferred Plan – 2024 Reference Build Plan



III. OVERVIEW OF THE BUILD PLANS, MARKET SCENARIOS, AND CASES

In this 2024 IRP Update, DESC has evaluated a total of twelve Build Plans, each of which reflects a unique balance of affordability, environmental considerations, carbon emissions, and

generation diversity in meeting customers' future energy needs over the planning horizon. Collectively they represent a broad range of available options to serve DESC's approximately 793,000 customers in South Carolina safely, reliably, and cost effectively under a diverse set of potential future market conditions and approaches to carbon reduction. All twelve Build Plans envision a dramatic expansion of Solar and Battery, while in all cases adding the generation resources needed to ensure that the reliability of the grid is protected. DESC has analyzed the twelve Build Plans across twenty-two individual cases to evaluate how well each performs under a range of different fuel costs, customer loads, and other assumptions.

A. The Twenty-Two Cases

DESC evaluated the five Core Build Plans (the "Core Build Plans") across the three most likely Market Scenarios, resulting in ***fifteen core cases*** (the "Core Cases"). The other seven non-Core Build Plans include five sensitivity cases ("Sensitivity Cases") to assess how Build Plans might vary under other sets of market conditions and to satisfy specific statutory and regulatory requirements and two supplemental cases ("Supplemental Cases") to assess how Build Plans might vary based on changes in CO_2 regulations or Wateree and Williams retirement dates. In preparing the 2024 IRP Update, DESC modeled a total of ***twenty-two cases:***

[Table begins on following page]

Table 1. The Eight Market Scenarios, 12 Build Plans, 22 Cases and 15 Core Build Plans

Eight Market Scenarios, 12 Build Plans, 22 Cases and 15 Core Build Plans			
Market Scenarios 8	**Build Plans 12**	**Cases 22**	
Core Cases			
Reference	Updated 2023 Reference Build Plan	**Five Core Build Plans times Three Market Scenarios = 15 Core Build Plans**	**15**
Reference	2024 Reference Build Plan		
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan		
Zero Carbon Cost	Zero Carbon Cost Build Plan		
Reference	85% CO_2 Reduction Build Plan		
Sensitivity Cases			
Electrification	Electrification Build Plan	**Five Sensitivity Cases**	**5**
Energy Conservation	Energy Conservation Build Plan		
Aggressive Regulation	Aggressive Regulation Build Plan		
Low DSM	Low DSM Build Plan		
High DSM	High DSM Build Plan		
Supplemental Cases			
Reference	Proposed GHG Rule Build Plan	**Two Supplemental Cases**	**2**
Reference	Retirements - 2032/2034 Build Plan		
		TOTAL	**22**

Each of the five Core Build Plans is optimized to achieve the lowest cost for customers under different market conditions or assumptions concerning achieving CO_2 emissions reductions. The Core Cases show how those plans respond under a broad range of conditions.

- As discussed above, the Updated 2023 Reference Build Plan is the 2023 Reference Build Plan reevaluated under 2024 load and fuel cost forecasts and other updated inputs. Due to the increase in the load forecast in 2024, the model was allowed to use its optimization function to add resources to supply the additional required capacity. Otherwise, the Updated 2023 Reference Build Plan is the same as the 2023 Reference Build Plan.
- The 2024 Reference Build Plan is a new Build Plan optimized under the most reasonable and likely future market conditions and using updated inputs.
- The High Fossil Fuel Prices Build Plan assumes high fossil fuel costs and Medium CO_2 costs in an environment where public policy discourages investment in fossil fuel supplies and reliance on them by end users.
- The Zero Carbon Cost Build Plan assumes policies neutral or favorable towards fossil fuels, low fuel costs, and no CO_2 costs at all.
- The 85% CO_2 Reduction Build Plan imposes 85% carbon reduction targets on the generation system, respectively, to be achieved in stages by 2050.

Table 2 below presents the twenty-two cases, with the fifteen Core Cases in blue, the Sensitivity Cases in orange, and the Supplemental Cases in green.

[Table begins on following page]

Table 2. The Twenty-Two Cases

	Fuel	CO_2 Price	Load Forecast	DSM	Wateree Retirement	Williams Retirement
Reference Market Scenario						
Updated 2023 Reference Build Plan	Medium	Medium	Reference	Medium	2028	2030
2024 Reference Build Plan	Medium	Medium	Reference	Medium	2028	2030
High Fossil Fuel Prices Build Plan	Medium	Medium	Reference	Medium	2028	2030
Zero Carbon Cost Build Plan	Medium	Medium	Reference	Medium	2028	2030
85% CO_2 Reduction Build Plan	Medium	Medium	Reference	Medium	2028	2030
High Fossil Fuel Prices Market Scenario						
Updated 2023 Reference Build Plan	High	Medium	Reference	Medium	2028	2030
2024 Reference Build Plan	High	Medium	Reference	Medium	2028	2030
High Fossil Fuel Prices Build Plan	High	Medium	Reference	Medium	2028	2030
Zero Carbon Cost Build Plan	High	Medium	Reference	Medium	2028	2030
85% CO_2 Reduction Build Plan	High	Medium	Reference	Medium	2028	2030
Zero Carbon Cost Market Scenario						
Updated 2023 Reference Build Plan	Low	Zero	Reference	Medium	2028	2030
2024 Reference Build Plan	Low	Zero	Reference	Medium	2028	2030
High Fossil Fuel Prices Build Plan	Low	Zero	Reference	Medium	2028	2030
Zero Carbon Cost Build Plan	Low	Zero	Reference	Medium	2028	2030
85% CO_2 Reduction Build Plan	Low	Zero	Reference	Medium	2028	2030
Sensitivity Cases						
Electrification Build Plan	Low	Zero	High	Medium	2028	2030
Energy Conservation Build Plan	High	Medium	Low	Medium	2028	2030
Aggressive Regulation Build Plan	High	High	High	Medium	2028	2030
High DSM Build Plan	Medium	Medium	Reference	High	2028	2030
Low DSM Build Plan	Medium	Medium	Reference	Low	2028	2030
Supplemental Cases						
Proposed GHG Rule Build Plan	Medium	Medium	Reference	Medium	2031	2034
Retirements - 2032/2034 Build Plan	Medium	Medium	Reference	Medium	2032	2034

B. The Core Analysis

The core analysis (the "Core Analysis") compared the results of the five Core Build Plans across the three representative Market Scenarios ("Core Market Scenarios') for a total of fifteen core cases (the "Core Cases"). To ensure comparability between the results, the five Core Build Plans and three Core Market Scenarios were all based on the Reference load growth projection so that all results show the costs and CO_2 emissions from meeting the same level of customer demand.

Table 3. The Fifteen Core Cases

Market Scenario	Case	Build Plan
Reference	**1**	Updated 2023 Reference Build Plan
	2	2024 Reference Build Plan
	3	High Fossil Fuel Prices Build Plan
	4	Zero Carbon Cost Build Plan
	5	85% CO_2 Reduction Build Plan
High Fossil Fuel Prices	**6**	Updated 2023 Reference Build Plan
	7	2024 Reference Build Plan
	8	High Fossil Fuel Prices Build Plan
	9	Zero Carbon Cost Build Plan
	10	85% CO_2 Reduction Build Plan
Zero Carbon Cost	**11**	Updated 2023 Reference Build Plan
	12	2024 Reference Build Plan
	13	High Fossil Fuel Prices Build Plan
	14	Zero Carbon Cost Build Plan
	15	85% CO_2 Reduction Build Plan

IV. SUMMARY OF BUILD PLAN SCORING

A. Scoring the Core Build Plans on Cost and CO_2 Emissions Reduction

Across all fifteen Core Cases, the 2024 Reference Build Plan had the lowest or second lowest cost to customers expressed as the levelized net present value ("LNPV") cost per year for generation supply.

The High Fossil Fuel Prices Build Plan scored the lowest in two Market Scenarios. The Zero Carbon Cost Build Plan scored lowest in one Market Scenario and second in another. But the LNPV cost differences between those two Build Plans and the 2024 Reference Build Plan were relatively small, approximately 2.3%, and the LNPV cost differences between the High Fossil Fuel Prices Build Plan and the 2024 Reference Build Plan is never more than 0.1%.

The 85% CO_2 Reduction Build Plan has the highest LNPV cost across all three Core Market Scenarios, with an annual LNPV cost between $277 million and $441 million more than the lowest cost plan under each Market Scenario. The difference between the 85% CO_2 Reduction Build Plan and the lowest cost Build Plan for each Market Scenario was an increase of between 11.6% and 22.8%.

The 85% CO_2 Reduction Build Plan achieves the greatest CO_2 emissions reduction of the Core Build Plans producing an 84.6% reduction in CO_2 emissions from 2005 levels. CO_2 emissions reductions among the remaining four Core Build Plans vary between 43.9% and 58.0% with the Zero Carbon Cost Build Plan having the lowest reduction and the 2024 Reference Build Plan achieving a 56.3% reduction.

B. Scoring the Core Build Plans on Rate Impacts

The 2024 Reference Build Plan, the High Fossil Fuel Prices Build Plan, and the Zero Carbon Build Plan effectively tie for having the lowest compound annual growth rate ("CAGR")

for a typical residential customer's bill (1,000 kWh/month) over a 15-year period planning horizon. The 85% CO_2 Reduction Build Plan has the highest CAGR in all Market Scenarios with annual growth in a typical residential customer's bill between 2.31% and 2.98%.

These figures represent only the change in customers' bills under the five Core Build Plans and the Reference assumptions due to forecasted changes in generation supply costs and the application of general inflation indices to other cost categories. They are provided as a comparative measure and not as a comprehensive forecast of future customer rates.

C. Scoring the Core Build Plans on Technologies Selected

Solar and Battery emerged as a major contributor in each of the Core Build Plans with Solar representing between 43% and 69% (2,625 MW and 8,300 MW) of the resources added (on a nameplate basis) and Battery representing between 13% and 33% (1,500 MW and 2,000 MW) of those resources. While each of the Core Build Plans adds at least 74% of non-emitting resources (on a nameplate basis), each also adds at least 1,325 MW of natural gas-fired generation to support system reliability. This result indicates that dispatchable, non-energy limited generation remains critically important to grid reliability and generation efficiency.

D. Scoring the Core Build Plans on Generation Diversity

All Core Build Plans envision at least 43% of generation capacity added over the planning horizon being Solar, and all involve the eventual elimination of coal as a fuel. Because the Build Plans strongly favor Solar, generation diversity is inversely proportional to the Solar resources added. Of the Core Build Plans, the Zero Carbon Cost Build Plan had the greatest generation diversity, the Updated 2023 Reference Build Plan was second, and the 2024 Reference Build Plan was third. The 85% CO_2 Reduction Build Plan scored lowest.

E. Scoring the Core Build Plans on Reliability

The 2024 Reference Build Plan, the High Fossil Fuel Prices Build Plan, and the Zero Carbon Cost Build Plan scored highest among the Core Build Plans under the reliability metric principally due to the relatively high amount of frame and non-frame combustion turbine ("CT") capacity added to the system under those plans. The 85% CO_2 Reduction Build Plan scored lowest, reflecting the absence of CT capacity.

V. THE FIVE SENSITIVITY CASES AND TWO SUPPLEMENTAL CASES

In addition to the Core Analysis, DESC modeled five additional Market Scenarios as Sensitivity Cases to fulfill requirements of the IRP Statute and Commission mandates. The Sensitivity Cases assume varying levels of CO_2 costs, environmental regulations, economic and load growth, and demand side management ("DSM") effectiveness and confirm the representative nature of the Core Build Plans and the value of the planning insights they provided.

Table 4. The Five Sensitivity Cases

Market Scenario	Sensitivity Case	Build Plan
Electrification	**1**	Electrification Build Plan
Energy Conservation	**2**	Energy Conservation Build Plan
Aggressive Regulation	**3**	Aggressive Regulation Build Plan
High DSM	**4**	High DSM Build Plan
Low DSM	**5**	Low DSM Build Plan

DESC modeled two additional Build Plans to test assumptions regarding the potential impact on DESC's generation planning from the EPA's GHG rulemaking proposal and the effects of delayed retirements of Wateree and Williams at alternative dates.

Table 5. The Two Supplemental Cases

Market Scenario	Supplemental Case	Build Plan
Reference	**1**	Proposed GHG Rule Build Plan
Reference	**2**	Retirements - 2032/2034 Build Plan

The scoring and metrics for the Sensitivity Cases and Supplemental Cases are discussed in Section XVI below.

VI. BALANCING THE STATUTORY FACTORS

The IRP Statute requires the Commission to balance multiple factors in accepting resource plan updates, including resource adequacy, least cost to customers, environmental compliance, reliability, exposure to commodity price risk, and diversity of generation and fuel supply. The 2024 IRP Update achieves this balance and presents a sound basis to plan for providing safe, reliable, affordable, and increasingly clean energy to its customers, which is DESC's primary mission. **Appendix K** cross-references the sections of this 2024 IRP Update to the requirements of the IRP Statute and other regulatory requirements.[4]

VII. THE ROLE OF AN IRP

IRPs are snapshots in time based on current forecasts of customers' future energy needs, future environmental constraints, future fuel prices and availability, and the cost or availability of rapidly evolving generation resources and technologies. An IRP update is a reframing of that snapshot. This 2024 IRP Update provides an update to DESC's roadmap and framework for future

[4] Appendix K also provides substantive responses to the suggestions made by ORS for matters to be discussed in Stakeholder meetings or the 2024 IRP Update as adopted in Order No. 2003-860(A).

decision making but does not reflect a fixed decision by DESC to pursue any specific action or project. Based on this 2024 IRP Update, DESC plans to move forward to continue to define the most reasonable path toward adding increasingly clean generation resources, continuing the modernization of its generation fleet, and retiring and replacing Wateree and Williams, all while meeting customers' energy needs, today and in the future, safely, reliably and affordably. DESC will continue to meet with South Carolina Office of Regulatory Staff ("ORS") and IRP stakeholders ("Stakeholders") on a regular basis to receive comments on the methodology and inputs used in this 2024 IRP Update. DESC will carefully review and consider the comments and suggestions received on this 2024 IRP Update both through the stakeholder process and by the Commission, ORS, and other parties through the formal IRP review process.

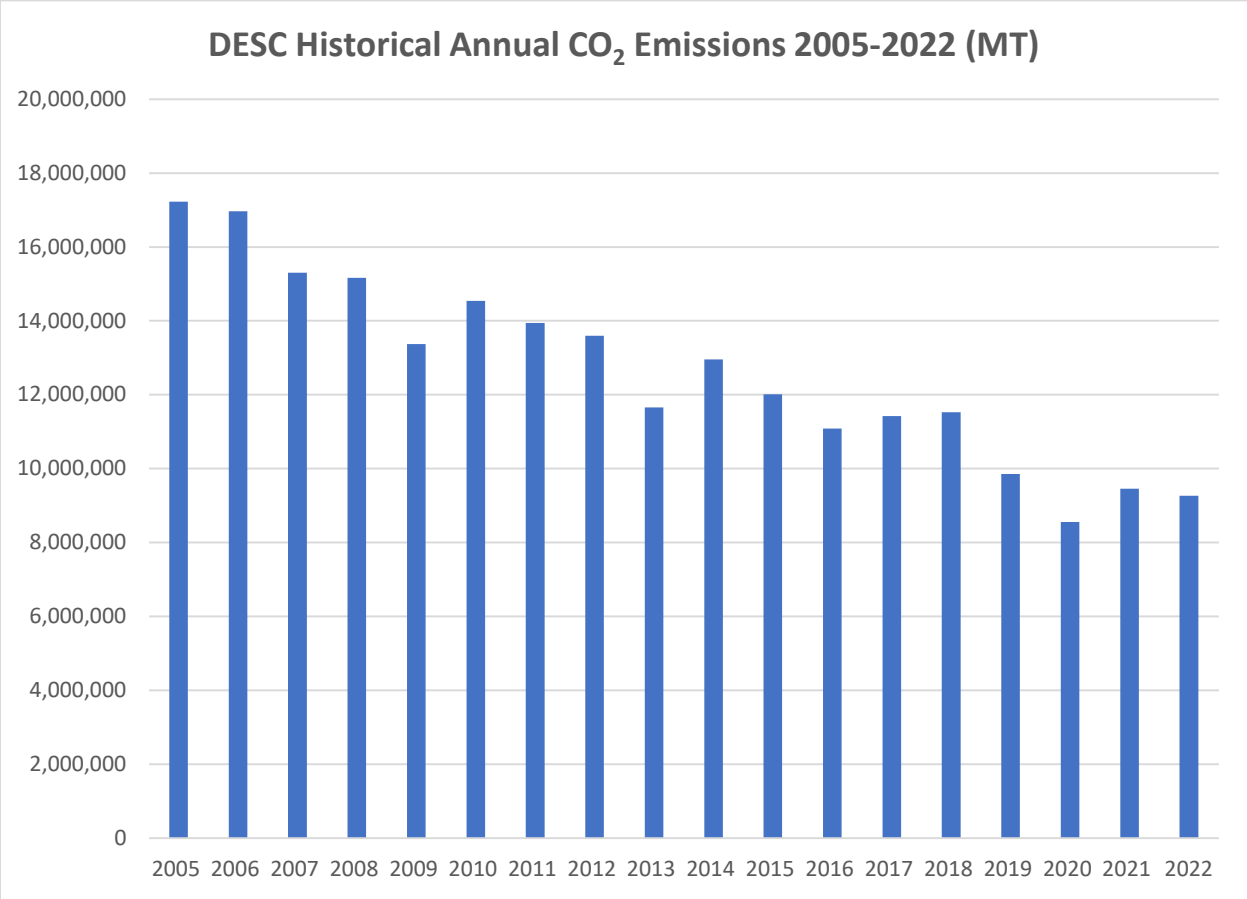
VIII. THE DYNAMIC NATURE OF RESOURCE PLANNING

Resource planning is conducted throughout the year by the Company for multiple planning and resource procurement purposes. DESC's resource plans will be updated to reflect current needs and the timing of those needs when future procurement or retirement decisions are considered. Given the pace of change in environmental policies, technology and the expectations of customers and other stakeholders, it is important that the Company remains flexible with respect to Build Plans and the asset procurements and retirements they reflect. The fact that DESC modeled the procurement or retirement of any resource in this 2024 IRP Update does not mean that DESC has made the decision to procure or retire any such resource or that such a decision has been approved by the Commission where such approval is required. These decisions will be presented to the Commission as appropriate at the time they are made or proposed, in accordance with the relevant aspects of the Utility Facility Siting and Environmental Protection Act.

IX. DESC'S COMMITMENT TO REDUCING CARBON EMISSIONS

For nearly two decades, DESC has been reducing carbon emissions by retiring or repowering coal plants, integrating third-party owned and operated solar, and adding high-efficiency natural gas-fired generation while remaining focused on reliability and affordability for its customers. Since 2000, DESC has either retired or converted eight of eleven coal units to gas, and from 2005 through 2022, carbon emissions have fallen by approximately 46%.

Figure 2. DESC's Historical Annual CO_2 Emissions 2005-2022



DESC's selection of the 2024 Reference Build Plan as its preferred plan to guide its planning decisions at the present time is consistent with its commitment to reducing carbon emissions. In the near term, the preferred plan adds significant renewable and related resources

like Solar and Battery, while also pursuing the retirement and replacement of Williams and Wateree coal capacity within the constraints imposed by the imperative of maintaining reliability and affordability. As market dynamics, public policy and technologies evolve, DESC will continue to evaluate and consider plans reflecting further carbon reductions consistent with DESC's mission of providing its customers with reliable, affordable, and increasingly clean energy.

X. COAL RETIREMENT AND REPLACEMENT PLANNING

A. The Potential Joint Resource to Replace Williams Capacity in Conjunction with Santee Cooper

In 2023, the Company and Santee Cooper decided to focus their collaboration on a potential Joint Resource to be built at DESC's former Canadys Station. Utilizing the Canadys site would leverage the robust electric transmission interconnectivity that exists at this site as well as its proximity to the St. George Switching Station, which is the principal southern hub on the recently upgraded electric transmission corridor between the northern and southern regions of DESC's service territory. By locating the project at Canadys, the two utilities could also take advantage of the existing natural gas transmission corridor running through the plant site and linking it to intrastate and interstate pipelines. Expanding natural gas pipeline capacity to support the Joint Resource could also provide the opportunity for local distribution systems and customers, including future industrial customers, to obtain new firm natural gas supply as part of the expansion. The Joint Resource could also result in economies of scale in construction and operations with potential savings to customers of both utilities that may not be achievable individually. Legislation to authorize Santee Cooper to pursue the Joint Resource is pending before the South Carolina General Assembly.

The ultimate size and configuration of the Joint Resource is yet to be decided. In this 2024 IRP Update, DESC has modeled the Joint Resource as two potential generation options which

assume that DESC receives 50% of the cost and output of either one or two 1,325 MW 2x1 NGCCs beginning in 2031. As discussed in Section XVI, *Build Plan Analysis*, the PLEXOS optimization modeling consistently selected the Joint Resource as the best resource to replace Williams across numerous Build Plans and multiple Market Scenarios and sensitivities, and it has emerged as the preferred option for replacing the Williams capacity. The plan and steps in the schedule for replacing the Williams capacity otherwise remain as stated in the 2023 IRP.

The Transmission Impact Analyses ("TIAs") prepared prior to the 2024 indicate the principal schedule challenge in retiring Williams remains the time required to complete the requisite generation interconnection studies and subsequently design, site, procure, and construct the electric transmission assets needed to replace Williams. A second schedule challenge will be the siting and construction of natural gas pipeline capacity to serve the Joint Resource, assuming it is selected as the replacement resource. DESC and Santee Cooper are continuing to negotiate with interstate pipelines for this capacity under non-disclosure agreements, and all indications remain that sufficient additional capacity can be provided in a timely manner and generally will follow existing natural gas pipeline and electric transmission rights-of-way corridors which greatly limits potential land use and environmental concerns. But the timing of the availability of this capacity is subject to factors which are outside of the control of DESC, Santee Cooper, and South Carolina policymakers.

B. The 2023 Transmission Impact Analysis

On January 12, 2023, DESC's Resource Planning Department issued a request to DESC's Transmission Planning Group to evaluate the electric transmission impacts (including costs and construction schedules) to support the retirement and replacement of Wateree and Williams (the "2023 TIA"). The 2023 TIA scenarios assume that DESC will retire Wateree by the end of 2028

and replace it initially with a combination of a large Frame CT resource at the Urquhart Station site along with a Battery resource at Wateree. The 2023 TIA scenarios additionally assume that the Joint Resource at Canadys will enter commercial service at the same time DESC retires Williams and that Santee Cooper retires Winyah in 2030. The original 2023 TIA request allowed for consideration of both the Canadys site and a potential site proposed by Santee Cooper in Hampton County.

On March 28, 2023, DESC's Resource Planning group amended the 2023 TIA to focus the study on the Canadys site only and with two potential proxy configurations of such an asset:

- a 1,300 MW natural gas-fired NGCC 2x1; or
- a 1,200 MW natural gas-fired NCCC 2x1 and 600 MW natural gas-fired NGCC 1x1.

In each case, DESC instructed the Transmission Planning Department to assume that DESC receives 50% of the output of the Joint Resource onto its transmission system, and Santee Cooper receives the remainder on its system. The transmission planning groups for DESC and Santee Cooper are coordinating parallel studies of the transmission requirements for the Joint Resource. The specific case descriptions for each case in the Amended 2023 TIA are as follows:

[Table begins on following page]

Table 6. The Amended 2023 TIA Cases

Case	Location	Primary Williams Replacement
1. Case One	*Canadys Site*	*1,300 MW of Generation at the Canadys Site*
Wateree is retired on December 31, 2028 and replaced with a 100 MW/400 MWh 4-hour Battery at the Wateree site and a 262 MW large frame combustion turbine at the DESC Urquhart site ("Urquhart Frame CT"). This resource combination could be augmented by utility-scale solar generation if deemed cost-effective and supported by the IRP. Williams is retired by December 31, 2030, and a new Joint Resource is constructed at the former Canadys site and placed into commercial operation by January 1, 2031. DESC would receive 50% of the output from 1,300 MW of NGCC generation constructed at Canadys and receive that energy on the DESC transmission system (650 MW). 50% of the Joint Resource's output would be delivered to Santee Cooper on their own transmission system (650 MW). It should be assumed that the combined cycle generation has a winter rating of 1,300 MW, a summer rating of 1,100 MW and a full load heat rate of 5,353 BTU/kWh.		
2. Case Two	*Canadys* Site	*1,800 MW of Generation at the Canadys Site*
Wateree is retired on December 31, 2028 and replaced with a 100 MW/400 MWh 4-hour Battery at the Wateree site and a 262 MW large frame combustion turbine at the DESC Urquhart site ("Urquhart Frame CT"). This resource combination could be augmented by utility-scale solar generation if deemed cost-effective and supported by the IRP. Williams is retired by December 31, 2030, and a new Joint Resource is constructed at the former Canadys site and placed into commercial operation by January 1, 2031. DESC would receive 50% of the output from 1,800 MW of NGCC generation constructed at Canadys and receive that energy on the DESC transmission system (900 MW). 50% of the Joint Resource's output would be delivered to Santee Cooper on their own transmission system (900 MW). It should be assumed that the combined cycle generation has a winter rating of 1,800 MW, a summer rating of 1,600 MW and a full load heat rate of 5,353 Btu/kWh.		

As specified in the Amended 2023 TIA request, each resource combination could be augmented by utility-scale solar generation if deemed cost-effective and supported by the 2023 IRP.

On January 25, 2024, DESC Transmission Planning issued the 2023 TIA Report. It found that the cost of the transmission upgrades associated with DESC's ownership share of the proxy Joint Resource would be $266 million for the 1,300 MW configuration and $270 million for the 1,800 MW configuration. These amounts are slightly less than the cost assumptions used in the modeling for the 2023 IRP and this 2024 IRP Update. In each case, the construction schedule is anticipated to require 60 months from the date that a signed interconnection agreement is received.

C. Potential RFP for Wateree Capacity Replacement

The plan and steps for replacing Wateree capacity generally remain as stated in the 2023 IRP. Consistent with the 2023 IRP, the Company plans to conduct a technology-neutral, all-sources competitive procurement process to identify the necessary generation resources to replace Wateree. Under the terms of the Partial Settlement Agreement entered in Commission Docket No. 2021-93-E ("Partial Settlement") and accepted by the Commission in Order No. 2022-27, the Company has been conducting an all-sources RFP for the replacement of four CT units and a conventional natural gas steam unit at the Urquhart site (the "Urquhart RFP"). The Urquhart RFP is a first-of-its-kind all-sources competitive procurement for DESC and the region. DESC conducted an extensive stakeholder process to create bid documents and bid solicitation and evaluation procedures. DESC intends to use the documents and bid solicitation and evaluation procedures developed for the Urquhart RFP as a template, with appropriate modifications, to guide the formulation of future all-sources competitive procurements. In response to stakeholder concerns with certain initial bids, on

December 22, 2023, DESC reissued the Urquhart RFP to allow initial bidders to rebid their projects. Final bids are due April 5, 2024.

Any replacement plan for Wateree capacity will have to account for the resources ultimately procured through the Urquhart RFP, as well as the timing and cost impacts of any electric transmission upgrades to support the Urquhart replacement assets, particularly any replacement generation resources that are not interconnecting to the existing Wateree site. Having more than one competitive procurement of similar scope pending at a time would be problematic in terms of administering both the RFP process and associated electric transmission interconnection processes, particularly given the first-of-its-kind nature of the Urquhart RFP. As a practical matter, DESC must wait until the constructive conclusion of the ongoing Urquhart RFP process before preparing and issuing future RFPs of similar scope. As the Urquhart RFP process continues, the Company will continue to evaluate the ability and timing of any future competitive procurement(s) to support a Wateree retirement and replacement strategy.

XI. KEY DEVELOPMENTS SINCE THE 2023 IRP

A. Stakeholder Process Update

The IRP Stakeholder Advisory Group[5] has met fifteen times since it first convened in 2020 and has provided the opportunity for a meaningful exchange of views to inform the IRP process.

[5] Stakeholder meetings are open to interested parties. The thirteen invited members [of the IRP Stakeholder Advisory Group are:

- Office of Regulatory Staff
- SC Energy Office
- Coastal Conservation League
- SC Small Business Chamber of Commerce
- SC Office of Economic Opportunity

[footnote continues on next page]

DESC has previously reported to the Commission on Stakeholder Sessions I-XIII. Since the last report, DESC conducted Session XIV and will file its report with its next update to the Commission regarding Stakeholder sessions. DESC has filed the agendas, presentation materials, minutes, and follow-up responses to prior Stakeholder sessions in Docket No. 2019-226-E, or the current docket, Docket No. 2024-9-E.

In Session XIV (January 24, 2024), the Company and Stakeholders reviewed action items to be included in this 2024 IRP Update from the Commission Order accepting the 2023 IRP, Order No. 2023-860(A), the results from the 2023 Transmission Impact Analysis, and planning for the 2024 IRP Update and proposed changes in inputs. DESC also sought feedback from Stakeholders on priority topics for future discussions. DESC will continue to convene Stakeholder sessions to encourage parties to raise questions and issues that they believe are important or relevant to the development of future IRPs and IRP updates.

B. Peaking Generation Replacements

In March 2021, DESC applied to the Commission for rulings to allow the Company to proceed with its plan to retire thirteen end-of-life and increasingly difficult to maintain natural gas-fired CT units and one natural gas-fired steam unit and to replace them with modern generation resources. Despite their age and condition, these older units have played an important role in maintaining grid reliability including providing DESC with the ability, if needed, to restart the grid

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- SC Energy Users Committee[footnote separated to next page]
- SC Community Action Partnership
- Southern Alliance for Clean Energy
- Johnson Development Associates, Inc.
- South Carolina Solar Business Alliance
- Sierra Club
- AARP South Carolina
- Walmart, Inc.

after blackouts through black start capabilities. In November 2021, the Company entered into a Partial Settlement, which allows for the retirement and replacement of most of these units to proceed. The exception was the retirement and replacement of several units at Urquhart Station, which the Partial Settlement required to be the subject of an all-sources RFP for replacement capacity. The Commission approved the Partial Settlement in Order No. 2022-27.

The Hardeeville, Bushy Park, Parr, and Coit Retirements and the Bushy Park and Parr Replacements

In accordance with the terms of the Partial Settlement, DESC is proceeding with the retirement of nine CT units at four sites (one unit at Hardeeville, two units at Bushy Park, four units at Parr, and two units at Coit) and construction of three modern aeroderivative combustion turbine ("Aero CT") replacement units (one unit at Bushy Park and two units at Parr). DESC retired the Hardeeville unit effective March 31, 2022, the Bushy Park units effective September 30, 2022, and the Parr units effective March 31, 2023. Dismantling and demolition activities at Hardeeville, Bushy Park, and Parr were completed in 2023. Construction of the Bushy Park unit is well underway, and the new unit is anticipated to enter commercial service before the end of 2024. Site preparation at Parr is underway with a focus on remediating environmental issues discovered in constructing the foundations for these units. The Parr units are anticipated to enter commercial service before the end of 2025. DESC plans to retire the Coit CT units following commercial availability of the replacement Parr units, at which point dismantling activities are planned to commence for those units.

[Figure begins on following page]

Figure 3: Construction Progress on Replacement Bushy Park CT Unit (As of February 2024)

Urquhart Replacements

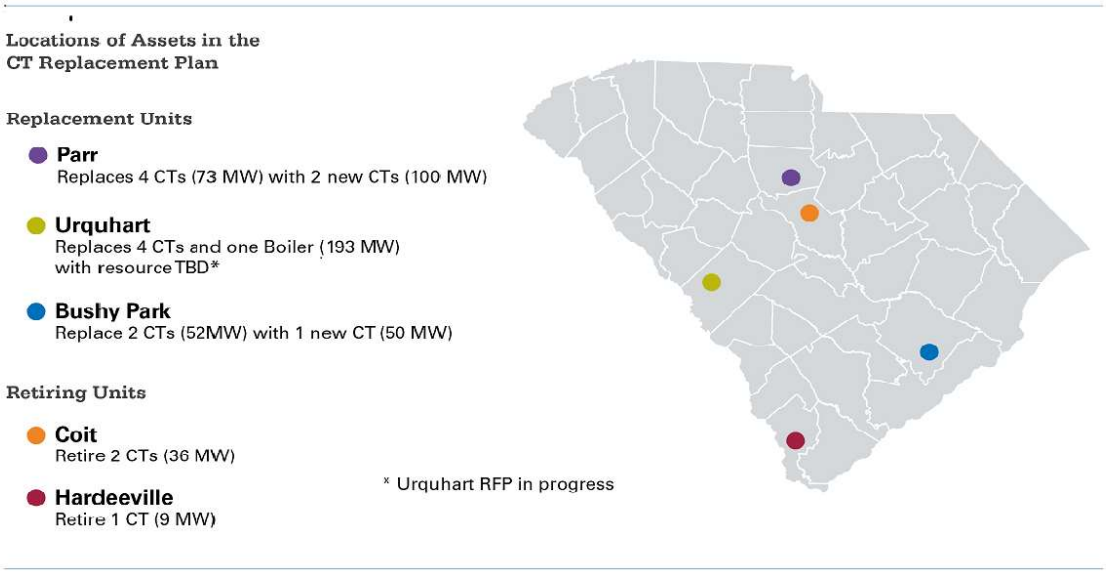
Under the Partial Settlement, DESC agreed to conduct an all-sources request for proposals to replace the four existing CTs and one natural gas-fired conventional steam unit at the Urquhart Station site. In accordance with the Partial Settlement, Charles River Associates was retained by DESC to facilitate the process to obtain stakeholder input into the design of the Urquhart RFP and to serve as the Independent Evaluator and Monitor for the RFP process. Stakeholder feedback was collected through five stakeholder sessions held in 2022. On August 11, 2022, DESC issued the initial RFP seeking resources that meet technology-neutral specifications for annual winter

capacity and black start capability located within the DESC Balancing Authority Area. Bids were received by December 22, 2022. The RFP received a robust response from multiple qualified entities for a diverse mix of supply-side generation facilities including Solar, Battery, hybrid Solar with Battery, and combustion turbine resources along with proposals for demand response. Almost twenty different facilities were bid into the RFP through over 40 different proposals, contracting mechanisms, or other considerations.

In 2023, DESC filed testimony with the Commission regarding the results of the Urquhart RFP and sought final Commission approval of its plan to proceed to construct the selected resources. Following objections from intervenors concerning certain bids, the Company solicited additional input from the concerned stakeholders and in response elected to reissue the Urquhart RFP to address concerns they raised. DESC reissued the RFP to bidders on December 22, 2023, and bids are due April 5, 2024. The Company anticipates concluding the evaluation of bids before the end of 2024.

[Figure begins on following page]

Figure 4: Location of Proposed Combustion Turbine Retirements and Replacements



C. Combined Cycle Uprates

DESC has long-term contracts with equipment manufacturers for the regular inspection and maintenance of the combustion turbine equipment at its NGCC units. DESC recently renegotiated these agreements to include provisions for Advanced Gas Path ("AGP") upgrades to increase the output, lower the fuel consumption, and extend the maintenance intervals for these turbines. The upgrades were performed between 2021 and 2023 as the units were taken offline for their normal scheduled maintenance intervals and included Jasper Units 1, 2, and 3 and Columbia Energy Center ("CEC") Units 1 and 2. All eligible units have now been upgraded.

The completion of these upgrades has added over 80 MW of additional winter capacity and approximately 50 MW of additional summer capacity to the system, improved the thermal efficiency of these units, and extended the intervals between required maintenance overhaul. The additional capacity at CEC is fully available for dispatch, and the additional capacity at Jasper will

be fully included in system capacity for operational and dispatch planning purposes when required transmission studies and any required network upgrades are completed. Until then, customers benefit from the additional fuel efficiency at Jasper and system operators can access additional output so long as real-time transmission system operating conditions permit.

Figure 5. A Jasper Station Combustion Turbine Rotor Awaiting Installation after Maintenance and Upgrade

D. The Infrastructure Investment and Jobs Act

On November 15, 2021, President Biden signed the Infrastructure Investment and Jobs Act ("IIJA"), which, in part, seeks to

- build a national network of high-speed electric vehicle ("EV") chargers;
- upgrade power infrastructure to deliver clean, reliable energy across the country;
- deploy cutting-edge energy technology to support a zero-carbon future; and

- make infrastructure resilient against the impacts of climate change, cyber-attacks, and extreme weather events.

To support these goals, the IIJA provides several competitive funding opportunities directly available to utilities, and some based on joint utility/governmental projects, such as electrification of school and transit buses and other governmental fleets. Much of the IIJA's funding is awarded on a competitive basis and in many cases will involve negotiating project agreements with federal, state, and local governments.

On January 31, 2024, DESC filed its semi-annual report with the Commission addressing efforts of the utility to obtain, directly or indirectly, federal grants, low interest loans or other benefits under the IIJA and the Inflation Reduction Act of 2022 ("IRA"). To date, no IIJA grants have been awarded to the Company. DESC's pursuit of available IIJA opportunities will continue over the law's five-year funding window.

DESC continues to pursue the available opportunities and to collaborate with stakeholders to develop proposals that benefit customers and the communities within which DESC operates. The Company's initial proposal for an award under the Department of Energy ("DOE") Grid Deployment Office's Grid Resilience and Innovation Partnerships program ("GRIP") was not granted, and DESC is evaluating recently issued DOE guidance concerning a second round of GRIP funding.

In October of 2023, DESC submitted an application under the IIJA's Maintaining and Enhancing Hydroelectric incentive payment opportunity program, which provides awards of up to 30% of the total project cost or $5 million. DOE has not made any decision concerning this application.

E. The Inflation Reduction Act of 2022

On August 16, 2022, President Biden signed the IRA into law, which includes an estimated $369 billion in climate and clean energy provisions, including grants and increased tax credits for new-build renewable generation resources including solar, storage, nuclear, and wind capacity.

For purposes of this 2024 IRP Update, as in the 2023 IRP, the modeling assumes that all Solar resources receive a PTC starting at $25.00 per MWh (2021$), escalating annually, and that Battery resources receive a 30% ITC on 85% of the total project cost. Under Internal Revenue Service ("IRS") rules, not all project costs qualify for an ITC and 85% is a reasonable estimate of the project components that will qualify. The modeling presented here assumes that the ITC and PTC apply to projects completed during the life of the program and for two years after the program closes to capture projects grandfathered into eligibility that were begun before the sunset date.

F. Offshore Wind, Small Modular Reactors and Green Hydrogen

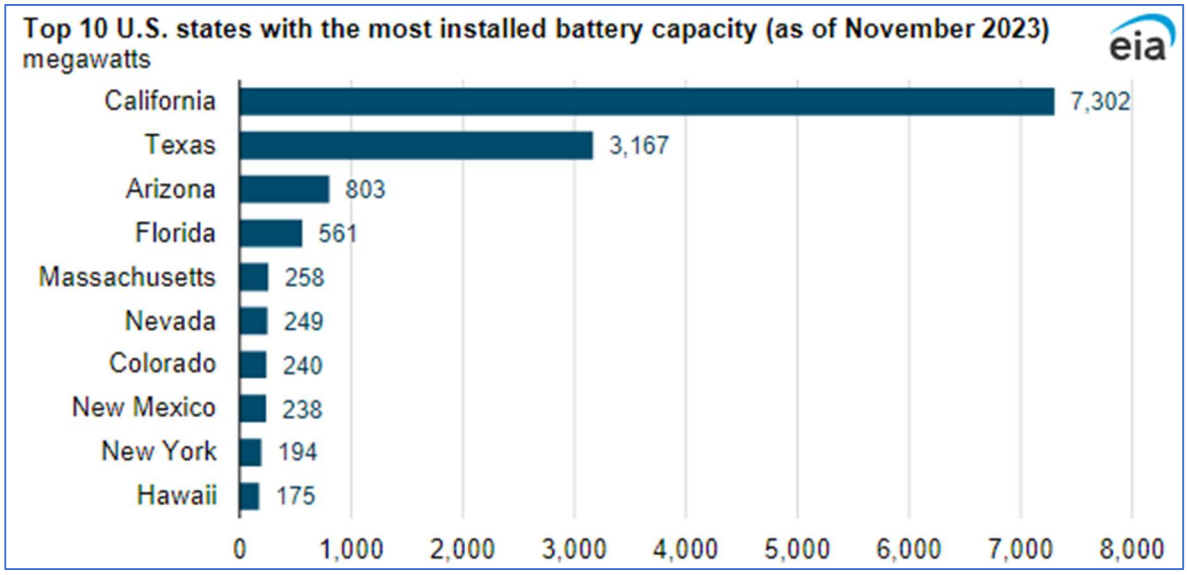
As in the 2023 IRP, DESC has assumed for modeling and planning purposes that offshore wind ("OSW") could be added as a resource beginning in January 2035 and that small modular reactors ("SMRs") could be a feasible supply-side resource option starting in 2040, although it remains conceivable that the deployment of SMRs could be further accelerated. Green hydrogen has been included for the first time in this 2024 IRP Update as a fuel that can be used for peaking generation and to displace fuel oil.

G. Medium and Long Duration Energy Storage

The 2024 IRP Update continues to identify battery storage as an important resource for meeting future system needs, particularly with high levels of intermittent non-dispatchable energy resources being added to the system. Based on the most current information sourced from the Energy Information Administration ("EIA"), the amount of utility-scale battery storage installed

in the entire United States by 2023 is just over 15 GW with approximately two-thirds of that capacity installed in the California and Texas markets and only about 1,600 MW, or about a tenth of that amount, having been in service for four years or more. Early experience with lithium-ion batteries has shown them to be prone to fires and relatively high rates of forced outages.

Figure 6: Installed Battery Capacity by State

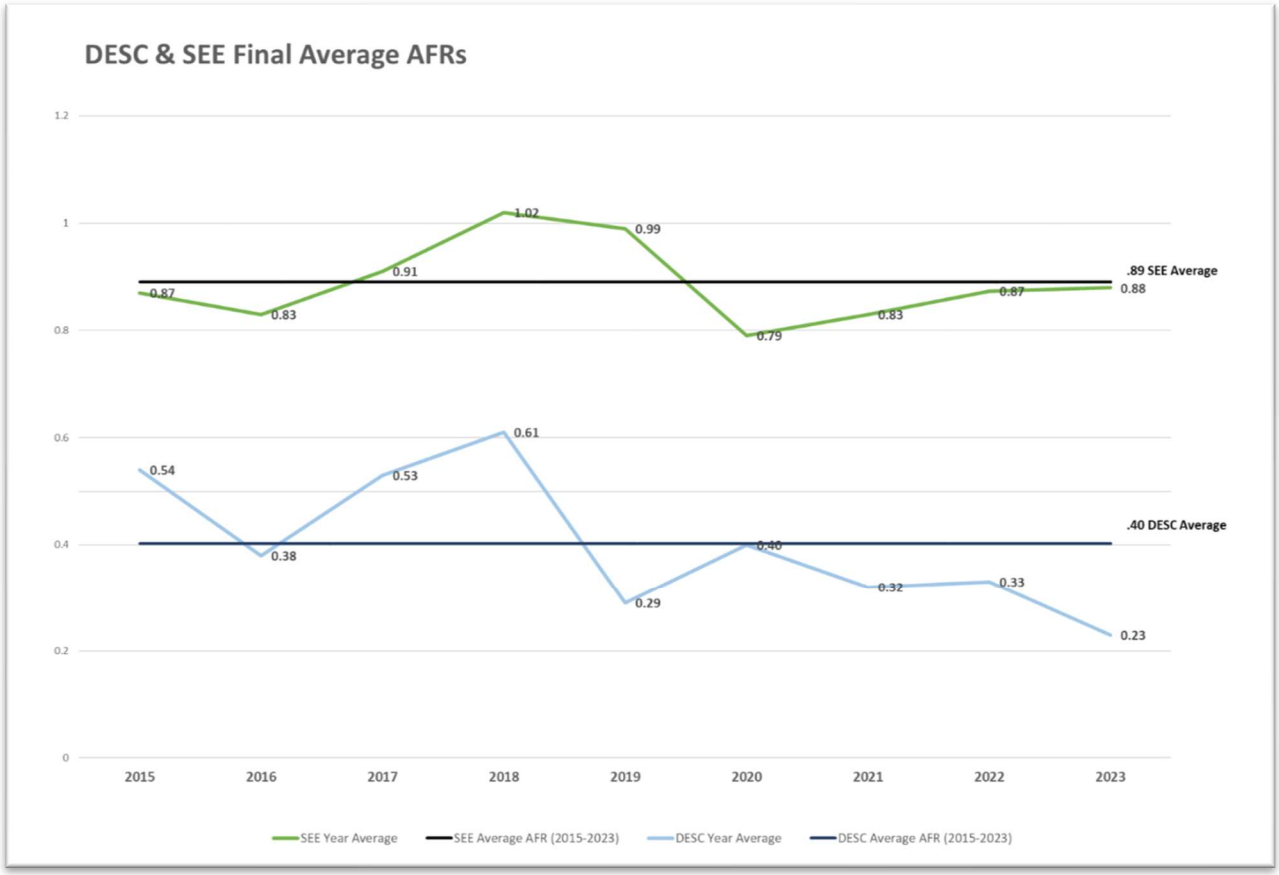


Dominion Energy Virginia ("DEV") is conducting or planning to conduct pilot projects that are using lithium-ion batteries ranging in size from 2 MW/ 4 MWh to 10 MW/ 40 MWh, iron-air battery chemistry at 5 MW/500 MWh, and zinc-hybrid battery chemistry at 4 MW/16 MWh. These pilots will provide the Dominion Energy operating companies valuable real world practical knowledge of the operations, maintenance, and development of these novel energy storage solutions.

XII. SAFETY

Safety, which is the Company's primary core value, is measured through the accident frequency rate ("AFR"). In 2023, the average AFR on DESC's electric system was approximately one quarter of the Southeastern Electric Exchange ("SEE") utility average:

Table 7. Accident Frequency Rate ("AFR")



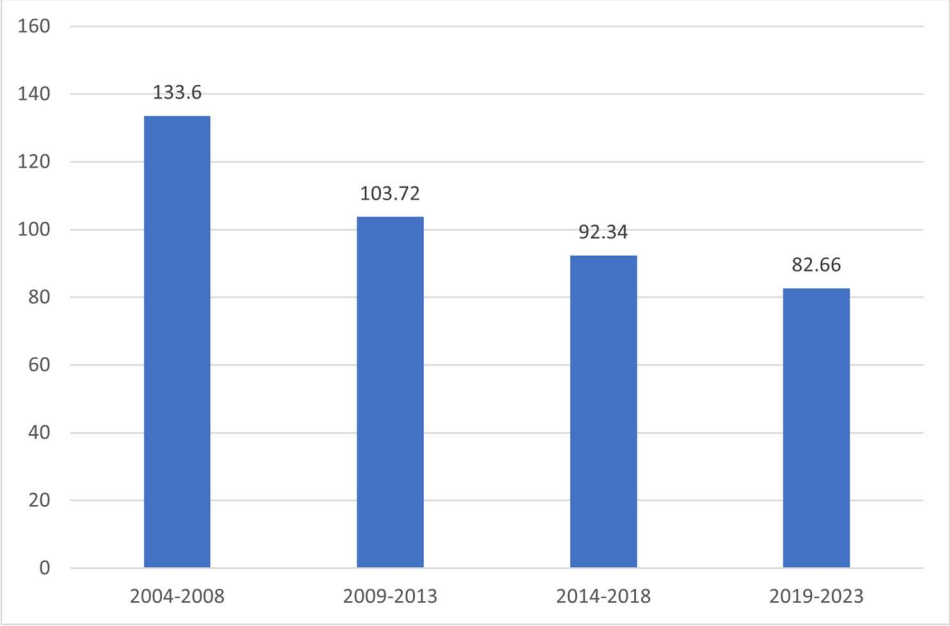
In 2023, DESC's OSHA recordable incident rate was 0.23. Its days away from work rate ("DART") rate[1] was 0.19, and its DART severity rate[2] was 25.2. These are excellent results.

XIII. DISTRIBUTION AND TRANSMISSION OPERATING REPORT UPDATE

A. Outages and Reliability

The industry benchmark for measuring operational effectiveness in transmission and distribution operations is the number of minutes on average a customer is without power, which is the System Average Interruption Duration Index, or SAIDI score. DESC's 2023 SAIDI was 89.9 minutes, compared to the 2023 average SAIDI of the investor-owned utilities in the State of South Carolina of 142 minutes. A lower SAIDI score indicates more reliable transmission and distribution systems.

Figure 7. System Average Interruption Duration Index – average minutes for each 5-year period



B. Storms and Storm Response

DESC experienced two major storm events in 2023 that impacted its service territory. In both cases the system performed well with limited numbers of outages and rapid restoration of service.

Tropical Storm Idalia occurred on August 30, 2023, beginning at approximately 2:00 p.m. The storm impacted a total of 69,987 customers. The peak outage occurred at 7:40 p.m. on August 30, 2023, with 29,217 customers without power. Restoration was largely complete within 16 hours.

The second storm was an unnamed nor'easter winter storm which occurred on December 17, 2023, beginning at approximately 6:00 a.m. The storm impacted a total of 17,536 customers. The peak outage occurred at 7:22 p.m. on December 17, 2023, with 5,203 customers without power. Restoration was largely complete within 12 hours.

Table 8. Major Storm Outages and Restoration 2014-2023

Event	Dates	Total Customers Impacted	Days to Restore Service
2014 Winter Storm Pax	2/12/14-2/19/14	151,700	7
Hurricane Matthew	10/7/16-10/16/16	313,300	9
Hurricane Irma	9/11/17-9/14/17	173,300	3
Hurricane Florence	9/14/2018	7,500	1
Hurricane Michael	10/11/18-10/12/18	68,800	2
Hurricane Dorian	9/4/19-9/8/19	186,400	4
April 2020 Tornados	4/13/2020	208,620	1
Tropical Storm Elsa	7/7/21-7/8/21	51,644	1
Winter Storm	1/3/22-1/4/22	128,230	1
2022 Winter Storm Izzy	1/16/22-1/18/22	31,321	2
Hurricane Ian	9/30/22-10/2/22	206,176	2
Winter Storm Elliott	12/23/22	49,895	1
Tropical Storm Idalia	8/30/23-8/31/23	69,987	1
Nor'easter Winter Storm	12/17/23	17,536	1

C. Transmission Plans and Planning

DESC continuously analyzes its transmission system to ensure the continued safe, reliable, and economical delivery of power to customers using the Reliability Standards for Transmission Planning (the "Reliability Standards") issued by the North American Electric Reliability Corporation ("NERC"). In 2023, DESC used these criteria to evaluate multiple new generation interconnection agreements or proposals, including the 2023 Transmission Interconnection Study for the Joint Resource, and new or rebuild transmission construction projects. DESC continuously updates its power flow models to reflect planned additions and modifications to the transmission and generation system, changes in power flows from adjacent systems, general levels of forecasted demand growth and specific changes in loads from major new residential developments and commercial, industrial, or wholesale customers. In 2023, the Company participated in multiple near- and longer-term reliability studies under the aegis of the Southeastern Reliability Council ("SERC"), the Carolinas Transmission Coordination Arrangement, and the South Carolina Regional Transmission Planning FERC Order 1000 planning region.

D. Transmission Projects

During 2023, DESC invested a total of $141 million in capital additions and improvements to its transmission system and completed seven major transmission projects representing $33 million of that amount. As a result of its annual and ongoing transmission reliability assessments, DESC has identified twenty-four major electrical transmission projects that are either ongoing or

planned within the next five years. A listing of these and additional major transmission projects are found in **Appendix B.**

The following twelve major transmission projects were begun or completed in 2023. In all cases of rebuilds of existing lines, the wooden structures were replaced with galvanized steel structures meeting all modern electric codes and providing increased reliability and resiliency.

i. **Cope Distribution 115-23kV Substation and 115kV Transmission Tap Line Construction *(Completed and in service March 2023).*** This project's scope was to build a new substation in the southwestern portion of Orangeburg County due to increased load in the area and to replace an aging substation.

ii. **Church Creek – Queensboro 115kV Phase 1 Transmission Line Construction *(Completed and in service August 2023).*** This project was needed to build a new transmission line on existing rights-of-way on James and Johns Islands in Charleston, SC to create a new tie line with Santee Cooper's transmission system.

iii. **Whiskey Road 115kV-12kV Substation and 115kV Transmission Line Construction *(Completed and in service November 2023).*** This project was to build a new substation and an associated transmission line in the Aiken area, to provide decreased loading for other existing substations, as well as to support distribution reliability in contingency situations.

iv. **Wateree - Hopkins 230kV Line #2 Rebuild Transmission Line *(Completed and in service November 2023).*** The rebuild of this line replaced aging infrastructure.

v. **Queensboro – Johns Island 115kV Tie and Church Creek – Queensboro 115kV Rebuild Stono River and Marsh Crossings Transmission Lines (*Completed and in service December 2023*).** The rebuild of these two lines was

needed to replace aging infrastructure which traverses difficult to access river, wetland, and marsh environments.

vi. **Denny Terrace Substation Replace Switch House *(Completed and in service December 2023).*** This project was needed due to the aging infrastructure and to upgrade the structure and housed equipment to new standards.

vii. **Bushy Park 115kV Substation for New Turbine *(In service expected March 2024).*** This project's scope is to build the new substation required for the power generation combustion turbine replacement project at Bushy Park.

viii. **Eastover - Square D 115kV Rebuild Transmission Line *(In service expected June 2024).*** The rebuild of this line is needed to replace aging infrastructure.

ix. **Coosawhatchie 115-23kV Substation and 115kV Transmission Line Construction *(In service expected July 2024).*** This project's scope is to build a new substation due to increased load and growth in the Yemassee and Coosawhatchie areas.

x. **Emory 230-23kV Substation and 230kV Transmission Line Construction *(In service expected July 2024).*** This project's scope is to build a new substation in the Saluda County area to improve reliability and redundancy in the area.

xi. **Hopkins - Square D 115kV Rebuild Transmission Line *(In service expected September 2024).*** The rebuild of this line is needed to replace aging infrastructure.

xii. **Ridgeville Commerce Park 115-23kV Substation and 115kV Transmission Line Construction *(In service expected December 2025).*** This project's scope is to build a new substation in the central Dorchester County area due to increased load in the area and new economic development.

E. AMI Roll Out

During 2023, DESC installed 174,760 AMI electric meters for a total to date of 719,285 AMI electric meters installed under this project. As of the close of 2023, DESC was no longer experiencing supply chain delays with project orders and has received all remaining meters needed to support the completion of the AMI project installations. Currently, DESC has less than 100,000 electric meters remaining to install and plans to complete the AMI electric meter rollout by Q3 2024.

XIV. GENERATION OPERATING REPORT UPDATE

A. DESC's Current Generation

As of 2024, DESC operates 58 hydro and fossil generating units with a dependable net winter generating capacity of approximately 5,243 MW and a single unit nuclear station with a net dependable winter generating capacity of approximately 666 MW (DESC's two-thirds share). These resources are supplemented by approximately 1,046 MW of solar generation purchased from third parties under long-term power purchase agreements ("PPA") and approximately 159 MW of additional customer-scale solar. DESC also benefits from a 4 MW allocation of power from the Southeastern Power Administration ("SEPA"), which operates hydro resources on the upper Savannah River. DESC's updated table of generation assets for 2024 is as follows:

[Table begins on following page]

Table 9. DESC's Existing Supply-Side Resources

	In-Service Date	Probable Retirement[1] Date	Summer 2024 (MW)	Winter 2024 (MW)
Combined-Cycle:				
Jasper – Hardeeville, SC	2004	2044	902	1,000
Columbia Energy Center – Gaston, SC	2004	2054	520	592
Urquhart Combined-Cycle – Beech Island, SC	2002	2029 (Steam)/2052 (CTs)	458	484
Total NGCC Capacity			1,880	2,076
Gas-Fired Steam:				
S.C. McMeekin – Irmo, SC	1958	2038	250	250
Urquhart ST3 – Beech Island, SC[1]	1954	*2029*	95	96
Total Gas-Fired Steam Capacity			345	346
Coal-Fired Steam:				
Cope - Cope, SC[4]	1996	2071	415	415
Wateree – Eastover, SC	1970	2045	684	684
A.M. Williams – Goose Creek, SC[2]	1973	2048	595	600
Total Coal-Fired Steam Capacity			1,694	1,699
Simple-Cycle Combustion Turbines:				
Bushy Park – Goose Creek, SC	*2024*		*0*	*52*
Parr - Parr, SC	*2025*		*0*	*0*
Hagood 4 – Charleston, SC	1991	2041	88	95
Hagood 5 – Charleston, SC	2010	2060	18	21
Hagood 6 – Charleston, SC	2010	2060	20	21
Coit – Columbia, SC[1]	1969	*2025*	26	36
Urquhart 1, 2, 3 – Beech Island, SC[1]	1969	*2029*	39	48
Urquhart 4 – Beech Island, SC[1]	1999	*2029*	48	49
Total Simple-Cycle CT Capacity			239	322
Nuclear:				
V. C. Summer - Jenkinsville, SC[5]	1982	2062	652	666
Hydro:				
Neal Shoals – Carlisle, SC	1905	2055	3	4
Parr Shoals – Parr, SC	1914	2064	7	12
Stevens Creek - Near Martinez, GA	1929	2079	8	10
Saluda - Irmo, SC	1932	2082	198	198
Fairfield Pumped Storage - Jenkinsville, SC	1978	2128	576	576
Total Hydro Capacity			792	800
Other:				
Southeastern Power Administration (SEPA) Allocation			4	4
Total Firm Capacity:			5,606	5,913
Solar:[3]				
PPA DER Program	2015-2019	2039	64	
PPA Non-DER Program	2017-2020	2040	982	0

Notes:

1. Probable retirement dates are based on the 2018 Depreciation Study, except Urquhart ST3 and CTs, Coit CTs, Bushy Park CT, and Parr CTs.

Coit CT Units are planned to retire following the commercial availability of the replacement Parr CT units (anticipated by end of 2025). A depreciation study has not yet been performed for the Bushy Park and Parr units, so no probable retirement date has yet been identified for these units.

Urquhart Steam Unit 3 and CT Units #1-4 are anticipated to retire no later than July 1, 2029 as required under the reissued Urquhart Replacements All Sources Request for Proposals for their replacements.

2. Williams Station is owned by South Carolina Generation Company ("GENCO"), a wholly-owned subsidiary of SCANA Corporation which is a wholly-owned subsidiary of Dominion Energy, Inc. GENCO's sells to DESC the total capacity and the entire output of Williams Station under a Unit Power Sales Agreement approved by the Federal Energy Regulatory Commission.

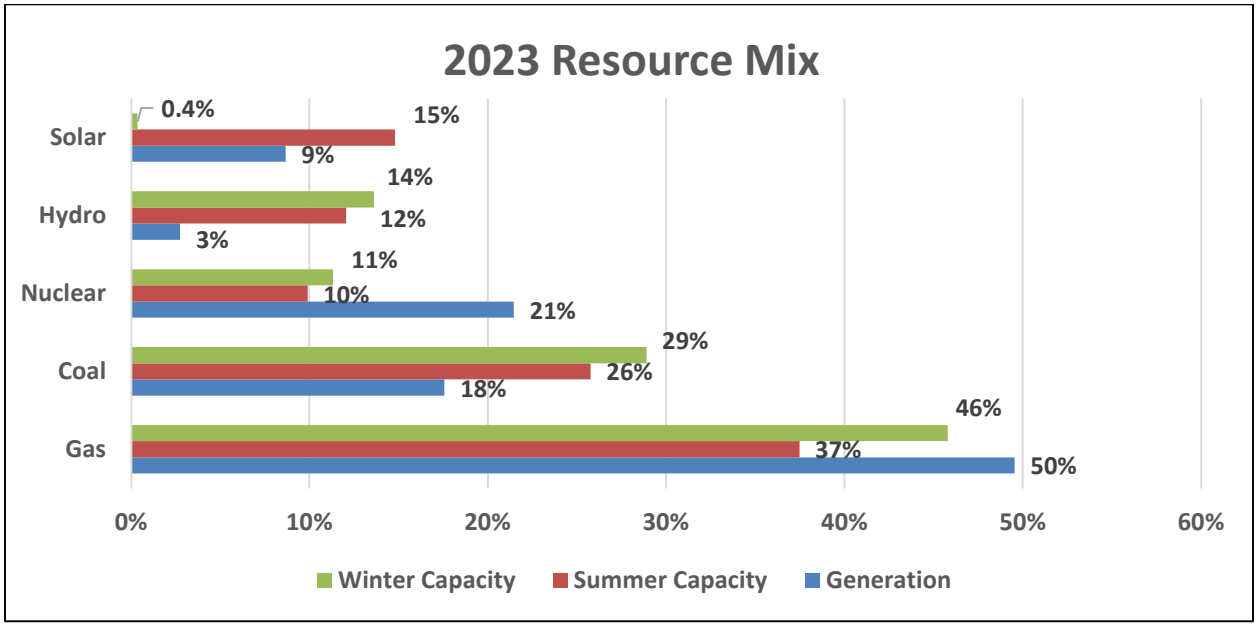
3. Solar MW are nameplate values and do not represent the contribution to peak demand.

4. Cope Station operates with coal as its primary fuel source but is also capable of operation on natural gas. All simple cycle CTs and combined cycle CTs can operate on either natural gas or ultra low sulfur fuel oil.

5. V.C. Summer Station capacity rating is at DESC's two-thirds ownership share.

In 2023, the five major classes of generation contributed to DESC's safe, reliable and efficient electric service to customers in the following percentages:

Table 10. DESC'S 2023 Resource Contribution to Energy Supply



Solar and Other Renewable Generation

In 2023, Solar and other renewable generation represented 1,047 MW of installed capacity and produced approximately 9% of DESC's energy needs as non-carbon emitting energy. In 2023, DESC had signed PPAs for three hybrid Solar with Battery energy storage described below:

- **Project 1** – 73.6 MW solar, 18 MW/72 MWh Battery energy storage. (This project is now in service.)
- **Project 2** – 62 MW solar, 15.5 MW/62 MWh energy storage. (While a PPA was signed for this project, it has now been withdrawn from the interconnection queue.)
- **Project 3** – 66 MW solar, 66 MW/198 MWh Battery energy storage which is expected to enter service before the end of 2024.

Nuclear Operating Report Update

In 2023, V.C. Summer Station produced approximately 5,010.4 GWh of non-carbon emitting base-load energy for DESC, representing approximately 21% of DESC's energy needs. Energy produced by V.C. Summer Station during 2023 displaced approximately 7.59 million tons of CO_2 that would have been emitted if replaced by fossil resources. The 2023 100% (undivided) generation output from V.C. Summer Station was approximately 7,3515.7 GWh.

In 2023, V.C. Summer Station met or exceeded all Nuclear Regulatory Commission safety and environmental requirements and has received favorable ratings from the Institute of Nuclear Power Operations ("INPO") operational standards assessment. For 2023, INPO rated V.C. Summer's overall performance as exemplary. An exemplary rating is the highest achievable rating from INPO.

In 2023, V.C. Summer Station's net capacity factor, based on reasonable excludable nuclear system reductions, computed under the provisions of S.C. Code Ann. § 58-27-865, was 102.51%, indicating a high degree of reliability. During 2023, V.C. Summer experienced one forced outage that caused V.C. Summer to enter the refueling outage 2.6 days earlier than planned. On August 17, 2023, the Company filed an application with the NRC to authorize a "Subsequent

Renewed Facility Operating License for Virgil C. Summer Nuclear Station Unit 1" to allow V.C. Summer to operate for an additional 20-years beyond the expiration of the currently in effect renewed license. The subsequent renewed license, if approved, would extend V.C. Summer operation into the year 2062.

Update of the Combined Cycle Generating Plants Operating Report

In 2023, DESC's NGCC units produced approximately 42% of DESC's energy needs providing 1,880 MW of capacity in the summer and 2,076 MW of capacity in the winter. These ratings are inclusive of the completed AGP upgrades on the three Jasper Station CT units and the two Columbia Energy Center CT units. For 2023, DESC's combined cycle units' Forced Outage Rate was only 0.2%.

Update of the Simple Cycle Combustion Turbines Operating Report

As of December 31, 2023, DESC's CT units were rated to provide 239 MW of capacity in the summer and 270 MW in the winter. In 2023, simple cycle CT units produced limited energy (0.11% of DESC's energy needs) but provided reserve capacity and blackstart capabilities necessary to ensure system reliability.

On March 31, 2023, DESC officially retired the Parr CT units in Fairfield County. The Company plans to retire the Coit CT units in downtown Columbia after the replacement CT units at Parr are available for commercial operation. The replacement CT units at Bushy Park and Parr are planned to enter commercial operation by the end of 2024 and 2025, respectively.

Fossil-Steam Units Operating Report

In 2023, DESC's fossil steam units provided approximately 26% of DESC's energy needs and provided 2,039 MW of summer capacity and 2,045 MW of winter capacity. The 2023 Forced Outage Rate for all fossil steam units was 0.7%. Detailed operating results for DESC's fossil steam units are provided in **Appendix J,** Generator Level Performance Data.

Hydroelectric-Power Operating Report

In 2023, Fairfield Pumped Storage returned to the system over 397 GWh of stored energy and provided 576 MW of capacity in both summer and winter. The remaining hydro units provided 216 MW of capacity in the summer and 224 MW of capacity in the winter. In 2023, DESC's hydroelectric plants provided approximately 2.8% of DESC's energy needs. In 2023, the Fairfield Pumped Storage Forced Outage Rate was 0%.

Hydro Relicensing. In July of 2009, DESC entered into a Comprehensive Settlement Agreement with the parties to its FERC proceeding to relicense the Saluda Hydro Project. DESC continues to await FERC's decision on the application. The relicensing of the Stevens Creek Project is under active review by FERC staff.

Saluda Hydro Upgrades. The Company is beginning a series of major upgrades on two of the Saluda Hydro units to ensure continued availability and reliable service. These upgrades are expected to include replacement of the penstock headgate assemblies, rewinds and upgrades of the generators, replacement of the turbine runners, and replacement of generator excitation and control systems. The generator step-up transformer units have already been replaced on all five units and the new transformers are sized to accommodate future planned generator upgrades. At the end of 2023, DESC completed rewinding the Saluda Unit 1 generator, which has been in service for over 90 years.

Parr Hydro. As part of the renewed license received in late 2020 for the Parr Hydro Project, the Company plans to upgrade all six of the generating units at the Parr Shoals Hydro facility over the next ten years. Completing these upgrades will enhance the reliability and availability of these units, which have been in service for over a century and reduce their impact on the aquatic environment. Replacing or rewinding the generators and replacing the turbine

runners are expected to increase the generating capacity of this facility but will not affect the capacity available to the system given the intermittent nature of run of river hydro resources.

B. Update on the Proposed GHG Rule

On May 23, 2023, EPA published a package of proposed regulatory actions that addresses emission guidelines under Clean Air Act Section 111(d) and 111(b) for GHG emissions from existing and new fossil fuel-fired steam generating units. EPA's proposed Section 111(d) includes a range of emission standards and timelines based on unit capacity factor and retirement dates for existing coal and other fossil fuel fired generating units. States have flexibility to develop implementation plans and may consider a range of approaches to achieve the emission reductions identified through Best System Emission Reduction ("BSER"). EPA's proposal also included revised New Source Performance Standards ("NSPS") for GHG Emissions from New, Modified, and Reconstructed Stationary Sources under Section 111(b) of the Clean Air Act ("CAA"). Under Section 111(b) EPA is proposing more stringent limits based on the type of unit and capacity factor. The proposal includes technologies and efficiency standards as well as options for carbon capture and storage ("CCS") and hydrogen blending which are dependent on a unit's capacity factor, type of unit, and timeline of in services for new sources. The proposed rules have been the subject of extensive challenge and comment, and the final rules are expected to be the subject of protracted litigation. According to EPA's Unified Agenda, the expected timeframe for issuance of a final rules is the second quarter of 2024.

C. Particulate and Ozone Regulations

On March 6, 2024, EPA released a final rule resulting from its reconsideration of the primary (health-based) National Ambient Air Quality Standards for Particulate Matter ("PM NAAQS"). EPA lowered the primary annual PM2.5 NAAQS from 12.0 ug/m3 to 9.0 ug/m3. EPA

retained the other PM NAAQs at their current levels. States are required to develop and submit attainment plans for areas designated as nonattainment for the revised NAAQs no later than 18 months after EPA finalizes designations. For areas in moderate nonattainment, these plans must provide for attainment as expeditiously as practicable but no later than the end of the sixth calendar year after nonattainment designations. Areas with more severe levels of nonattainment have longer periods to achieve attainment of the new standards. According to EPA, the earliest states would need to come into attainment with the revised PM2.5 NAAQS is in 2032. All of the DESC assets are currently in locations that are in attainment with the lower PM2.5 standards.

EPA concluded its most recent ozone NAAQS review in December 2020 with the publication of a final rule which retained the 2015 primary and secondary ozone NAAQS at levels of 70 parts per billion without revision. On October 29, 2021, following the change in administration, EPA announced that it would reconsider the 2020 decision to retain the ozone NAAQS. To support the reconsideration, EPA developed two versions of a draft Policy Assessment ("PA"), which were reviewed by the Clean Air Scientific Advisory Committee ("CASAC") at a series of public meetings that concluded in May 2023. A majority of CASAC members recommended that EPA revise the ozone NAAQS within a range of 55 to 60 ppb. EPA has not finalized the reconsideration PA. EPA filed that they will seek a remand of the 2020 decision and will be publishing a call for scientific information in Q1 2024. EPA plans to convene its science and policy workshop in spring 2024, with a summary of the workshop to be issued in summer 2024.

XV. MODELING INPUTS AND ASSUMPTIONS

A. Load Growth Forecast

As its reference load forecast, the 2024 IRP Update incorporates the Company's 2024 annual Base Load Forecast of customers' future energy and demand needs. The compound annual rate of growth in summer and winter demand over the twenty-year planning horizon are 1.5% and 1.14% respectively. Compared to the 2023 demand growth forecast, the 2024 demand growth forecast is higher by 0.6 percentage points in summer and 0.54 percentage points in winter. The forecast incorporates two new economic development customers beginning in 2026 with a total peak demand of 269 MW in the summer and 256 MW in the winter by 2032.

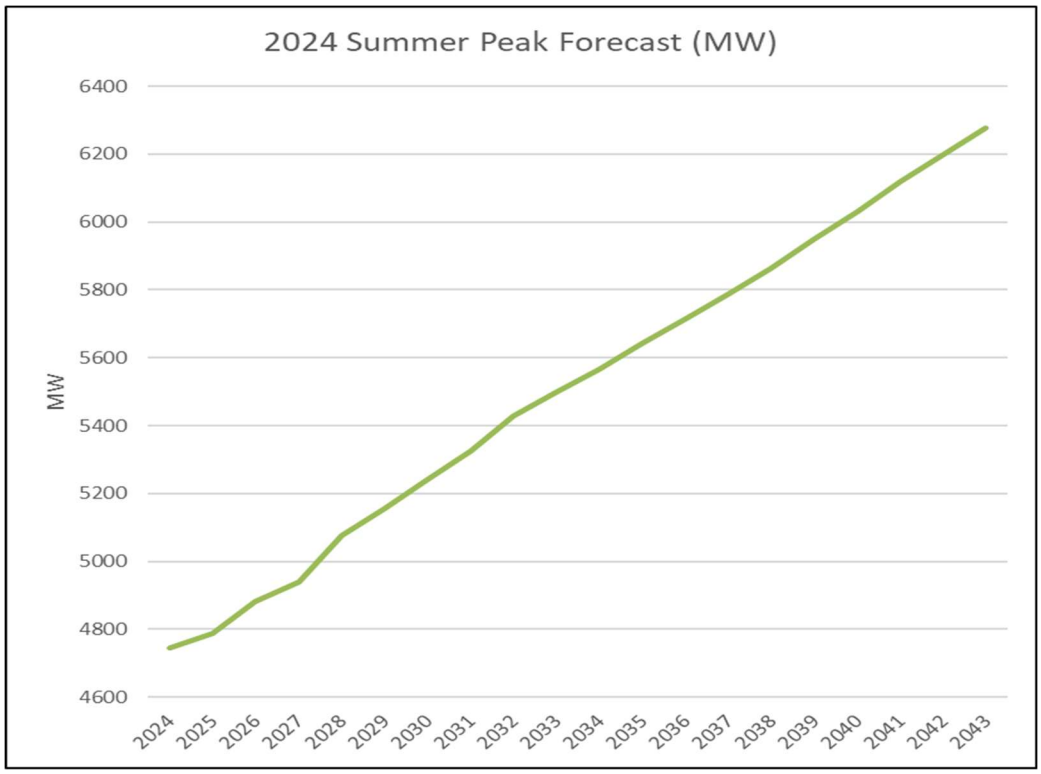
[Table begins on following page]

Table 11. 2024 Annual Energy and Peak Forecast

Peak Forecast			
Year	Sales GWh	Summer MW	Winter MW
2024	23258	4744	4739
2025	23419	4786	4785
2026	24122	4883	4869
2027	24700	4941	4937
2028	25634	5075	5041
2029	26204	5156	5116
2030	26770	5240	5178
2031	27338	5327	5249
2032	27826	5429	5310
2033	28147	5499	5351
2034	28474	5566	5390
2035	28846	5642	5435
2036	29197	5715	5477
2037	29525	5787	5524
2038	29943	5864	5576
2039	30356	5950	5634
2040	30739	6031	5692
2041	31135	6118	5755
2042	31509	6199	5818
2043	31892	6276	5877

Below is the 2024 summer peak forecast.

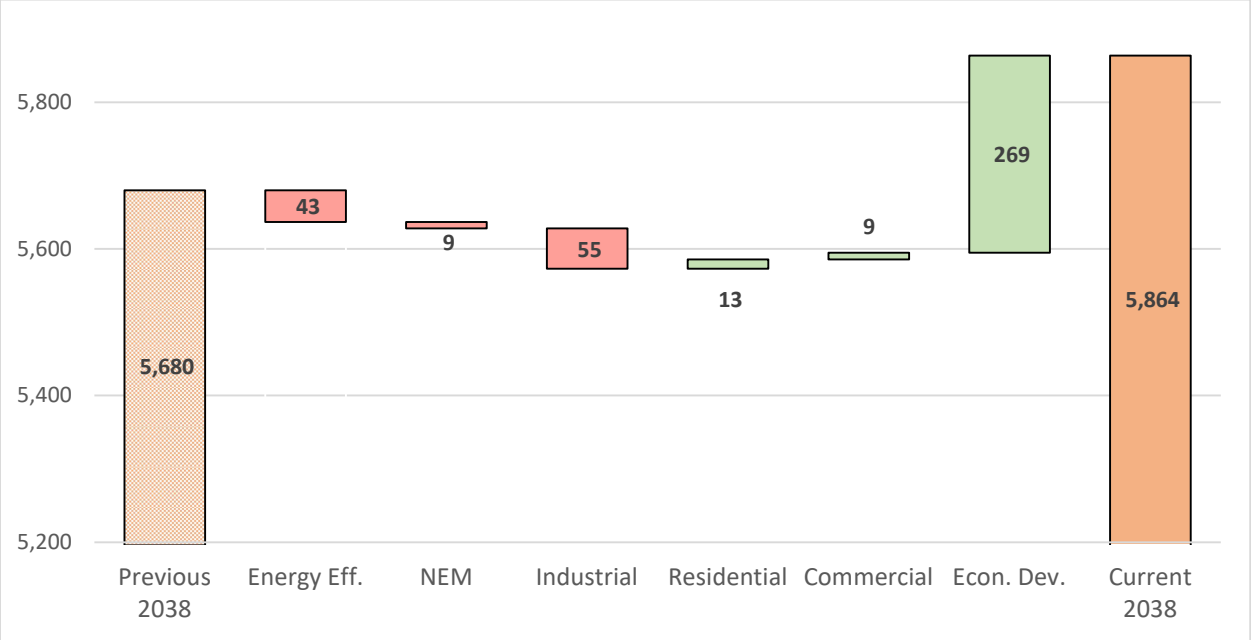
Figure 8. Summer Peak Forecast (MW)



The current peak demand forecast is generally similar to the 2023 peak demand forecast with the exception of the two new large customers. The chart below shows the impact from changes in Energy Efficiency, Net Energy Metering, Industrial, Residential, Commercial and Economic Development on the 2038 summer peak forecast. Economic Development represents the two new large customers.

[Chart begins on following page]

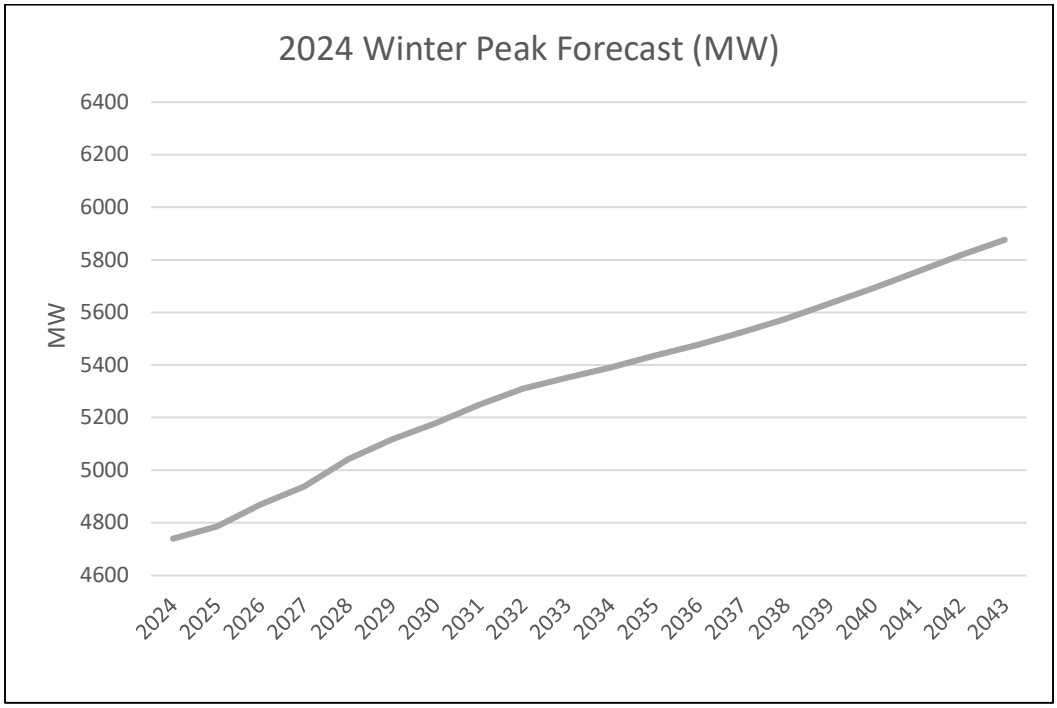
Figure 9. The 2023 and 2024 Peak Demand Forecasts for 2038 Compared



The 2024 forecast of winter peak demands is generally consistent with those from 2023, with the addition of the two new large customers.

[Chart begins on following page]

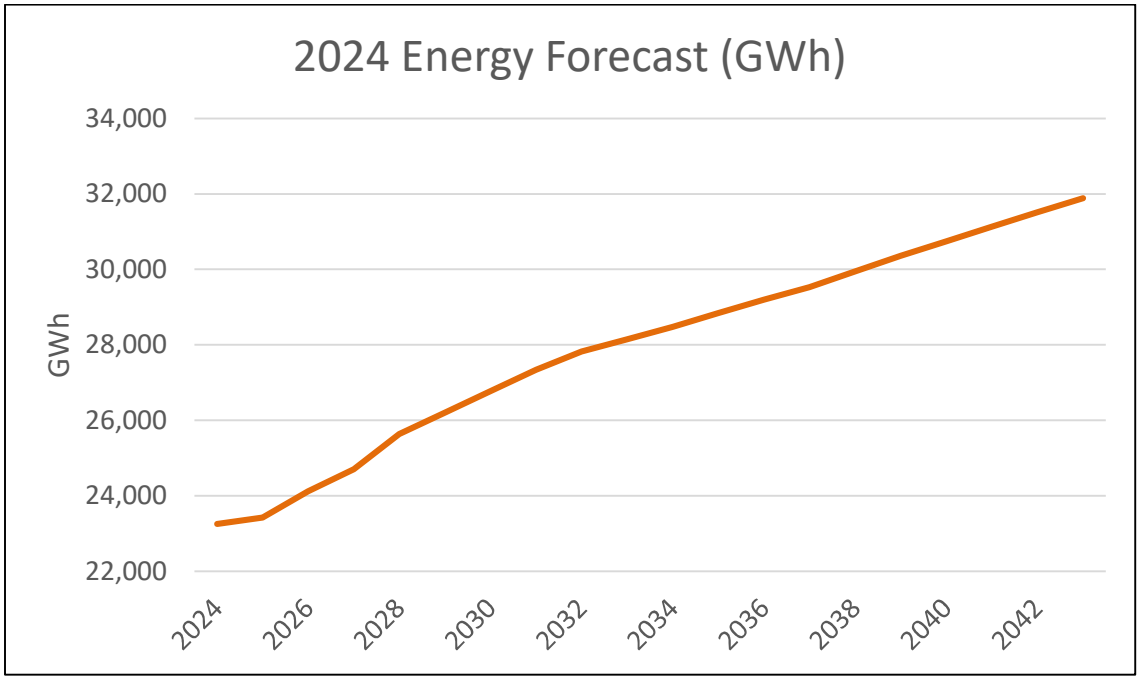
Figure 10: Winter Peak Forecast (GWh)



The compound annual rate of growth energy demand over the twenty-year planning horizon is forecasted at 1.7%. The 2024 reference energy forecast is higher than the 2023 reference energy forecast by 0.8 percentage points.

[Chart begins on following page]

Figure 11: Energy Forecast (GWh)

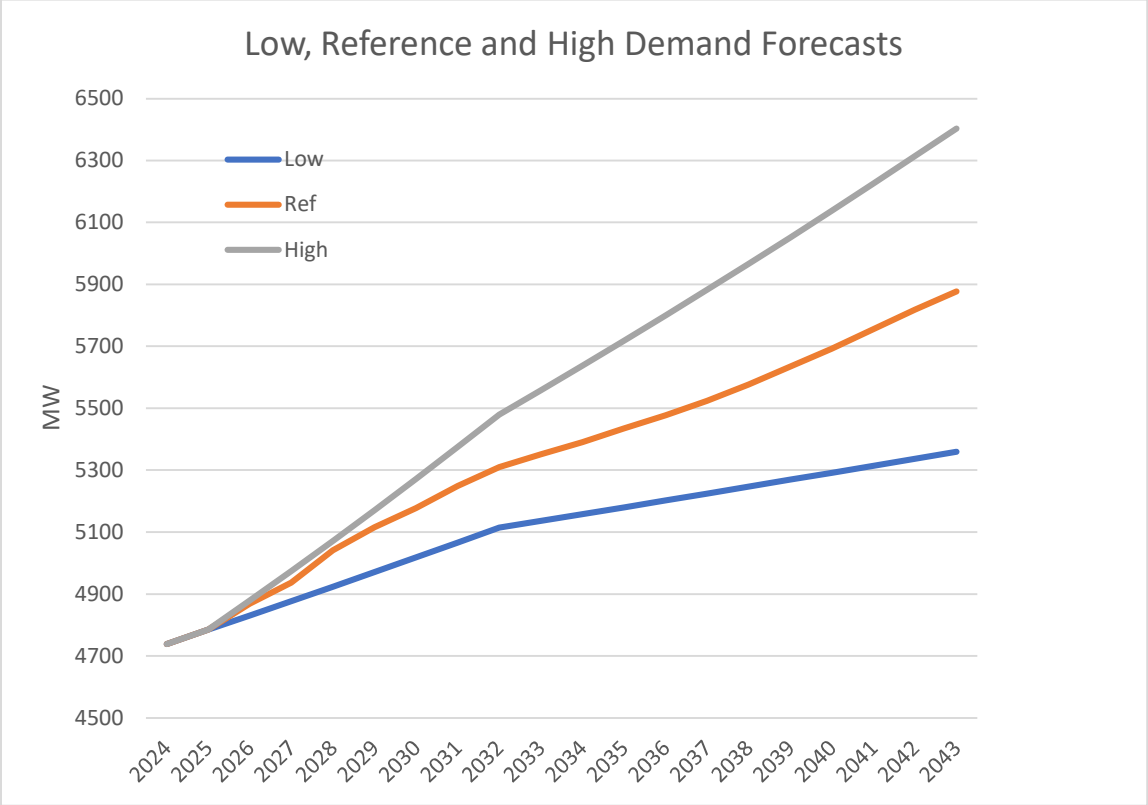


B. Analysis of Load Growth Rates under Alternative Economic Scenarios

As required by S.C. Code Ann. § 58-37-40(B)(1)(a), DESC has created high and low growth rate scenarios to assess its generation planning under alternative economic scenarios. As it did in the 2023 IRP, DESC has done so by increasing or decreasing growth in demand by 0.5% for the high and low load growth scenarios respectively. Over 20 years, these high and low load growth assumptions create a band around the reference electrical demand forecast of 517 MW on the low case and 527 MW on the high case, or 8.8% and 9.0%, respectively, of the reference forecast of 5,877 MW in 2043. The band around the reference energy forecast is between 2,706 GWh on the low load case and 2,943 GWh on the high load case, or 8.5% and 9.2% of the reference forecast, respectively. This is a reasonably broad band.

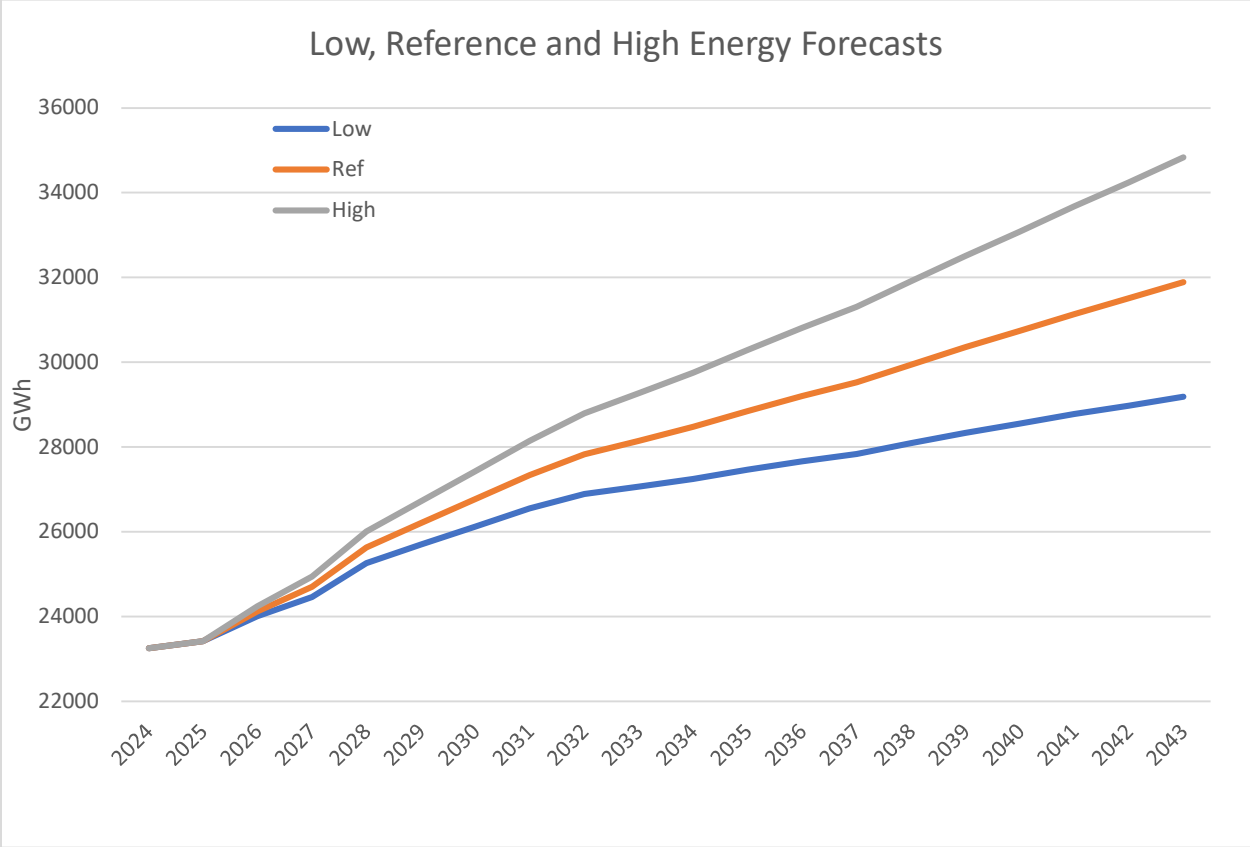
[Chart begins on following page]

Figure 12: Low, Reference and High Demand Forecasts



[Chart begins on following page]

Figure 13: Low, Reference and High Energy Forecasts



C. Wholesale Sales

After terminating sales to the City of Orangeburg at the end of 2023, wholesale customers sales represent approximately 0.3% of the Company's sales as reflected in the 2024 IRP Update.

D. DSM Assumptions

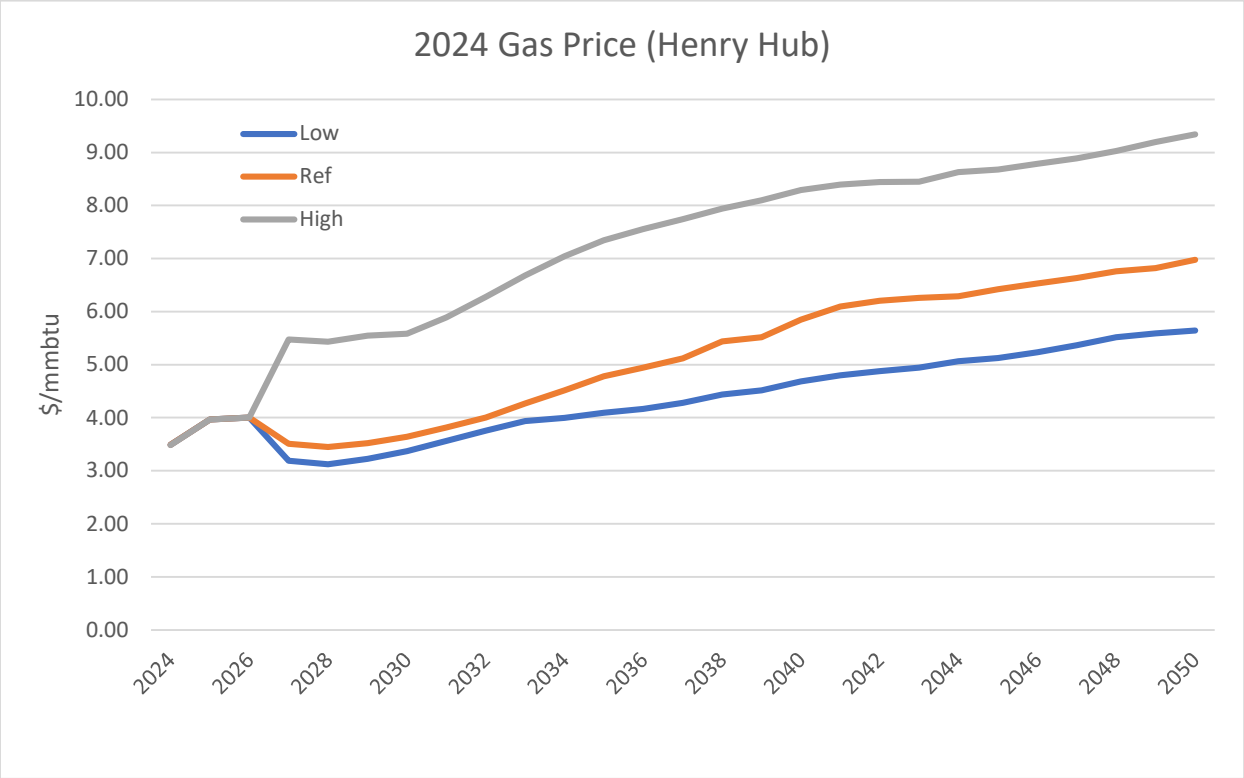
As it did in the 2023 IRP, DESC modeled a High DSM, Medium DSM and a Low DSM case based on the results of the 2023 DSM Potential Study. The High DSM case assumes that DESC achieves a reduction in annual forecasted load growth (excluding opt-out customers) of 0.74% of gross energy sales, the Medium DSM case assumes that DESC can achieve a 0.51% gross energy sales reduction and the Low DSM case assumes that DESC is only able to achieve 90% of the energy reductions assumed under the Medium DSM case, or 0.46%. All of DESC's

energy and demand values include marginal line losses for DSM and the forecasted benefits of demand reduction programs.

E. Natural Gas Price Forecast

As in the 2023 IRP, the base natural gas price forecast for the first three years of the planning horizon reflects the prices of publicly traded NYMEX Henry Hub contracts and for the following years reflects the natural gas price forecast from the EIA Annual Energy Outlook which provides the Low, Reference and High forecasts needed to model various fuel cost levels. These costs have been updated to reflect current data.

Figure 14. Gas Prices (Henry Hub)

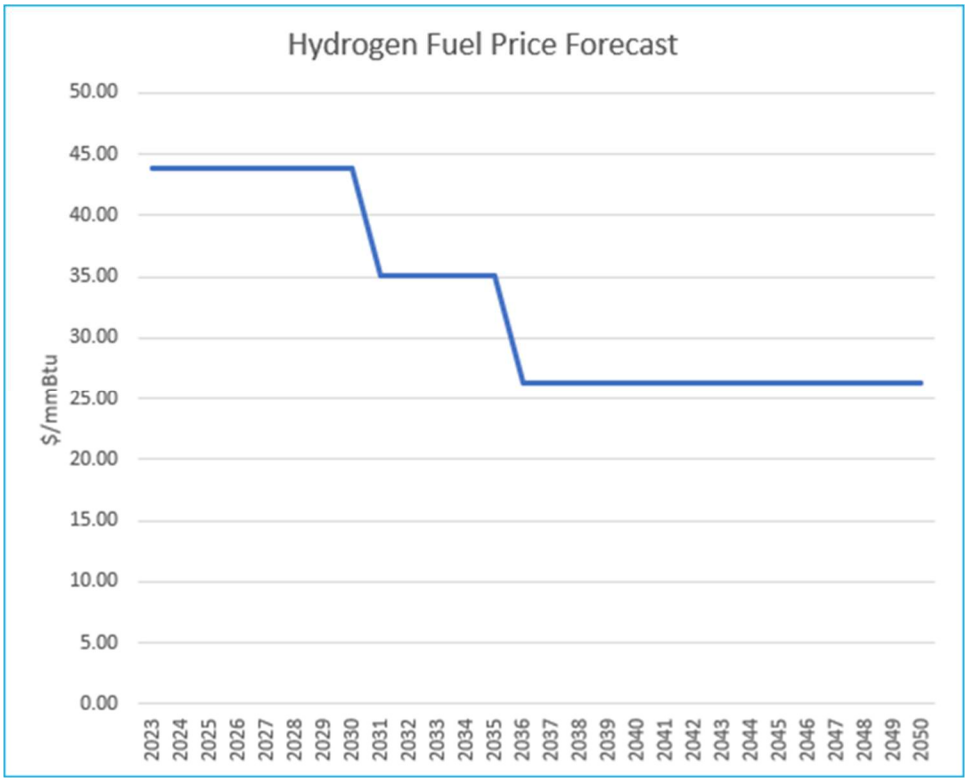


F. Green Hydrogen Forecasts

Green hydrogen is an emerging fuel which EPA has defined as a hydrogen derived fuel that is produced through a process that results in a well-to-gate GHG emission rate of less than 0.45

kilograms of CO_2 equivalent per kilogram of hydrogen produced. DESC has included it in its modeling for the first time in this 2024 IRP Update. DESC is not aware of any single authoritative forecast of green hydrogen prices and the price forecast used here represents an internal DESC viewpoint informed by various publicly available sources. DESC observed that most published sources are providing targets or goals instead of a fundamentals-based forecast with annual or monthly values. The DESC forecast has hydrogen pricing dropping below the price of the main peaking fuel alternative (fuel oil) in the mid-2030s, but given the uncertainties involved with green hydrogen the price reported here does not drop as low as some published targets.

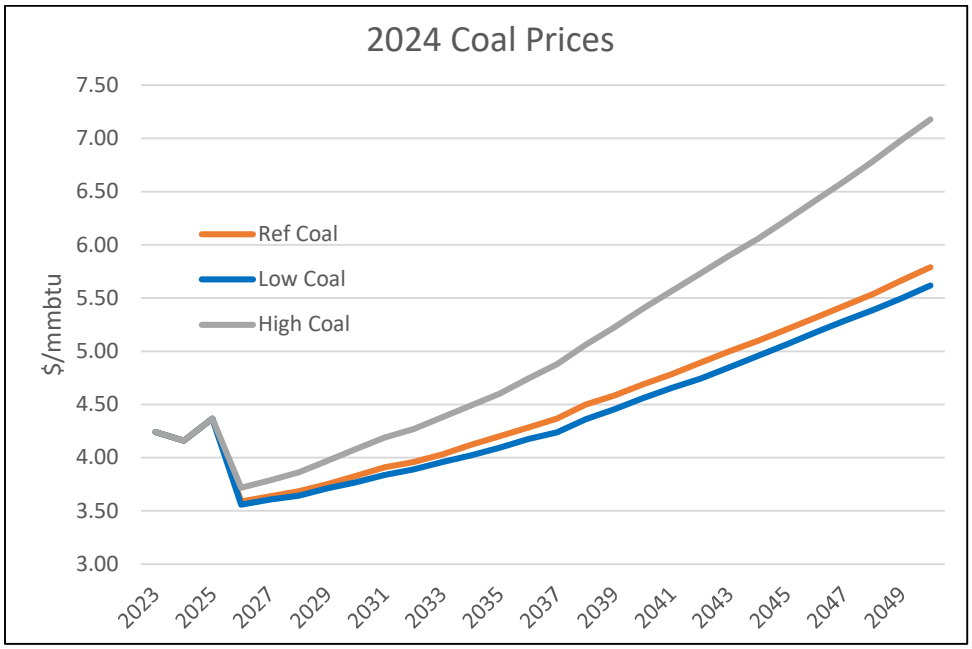
Figure 15. Hydrogen Fuel Price Forecast



G. Coal Price Forecasts

As was the case in the 2023 IRP, DESC's forecasted coal prices are based on the Company's direct knowledge of Appalachian coal contract prices for the upcoming three years and EIA forecasts for later years. High and low coal price forecasts were based on the high or low-price forecast provided by the EIA in its Annual Energy Outlook, all as updated with current data.

Figure 16. Coal Price Forecasts

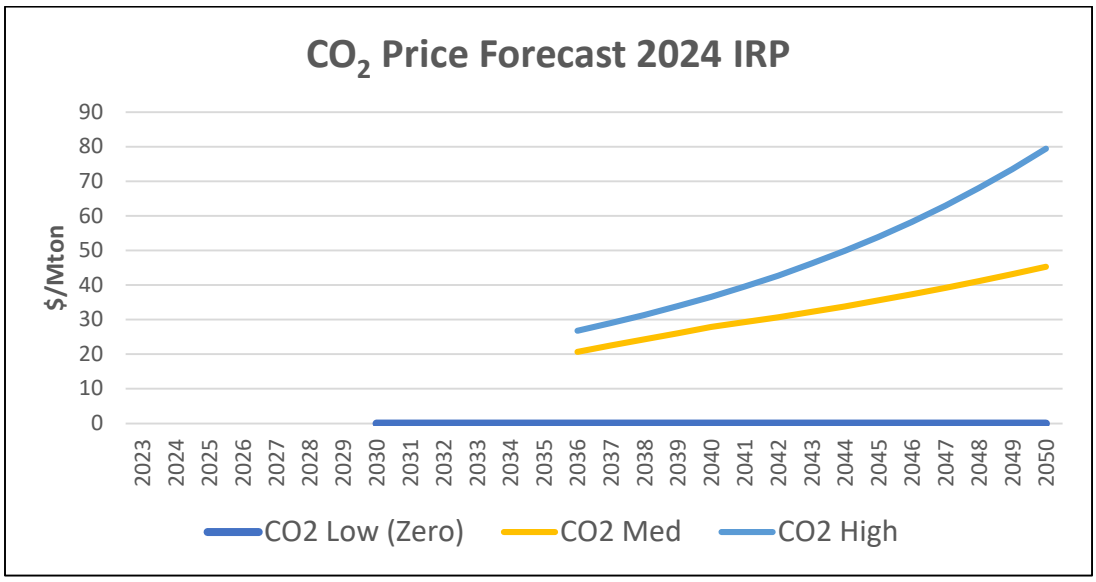


H. CO_2 Price Forecasts

As was the case in the 2023 IRP, DESC based its medium CO_2 price forecast on the IHS "US Power Sector" forecast, which increases from $20.70/Mton in 2036 to more than $45/Mton by 2050. DESC assumes that a CO_2 price is imposed beginning in 2036.

For the high view of CO_2 prices, DESC assumed that CO_2 prices would be 30% higher ($26.83/Mton) than the IHS forecast. The price escalates to $80/Mton by 2050. The low view of CO_2 prices assumes that they remain at zero.

Figure 17. CO_2 Price Forecasts



I. Reserve Margin Requirements

Based on the 2023 Reserve Margin Study, and consistent with the 2023 IRP, DESC informed the PLEXOS model to maintain a single integrated minimum 20.1% winter reserve margin which enveloped the minimum 15% summer reserve margin.

J. Recently Added or Upgraded Generation Resources

The PLEXOS model includes as existing generation resources all binding solar PPAs whether already in place or contracted to enter service during the time the IRP was being modeled. They total 1,174 MW of capacity and include three recent contracts for paired solar and energy storage PPAs representing (i) 73.6 MW of Solar and an 18 MW four-hour duration Battery, (ii) 62 MW of Solar and a 15.5 MW four-hour duration Battery and (iii) 66 MW of Solar and a 66 MW three-hour duration Battery.

DESC has an additional contract for 75 MW of Solar which is not included in system resources because the PPA was signed after modeling was substantially complete. DESC has also

received several Notice of Commitment to Sell forms from developers of Solar and hybrid Solar with Battery facilities with a total Solar nameplate of about 600 MW and Battery nameplate of 400 MW.

K. Future Generation Resources Available to PLEXOS and Their Capital and Operating Costs

In consultation with Stakeholders, DESC identified fourteen generating resources for PLEXOS to call on in this 2024 IRP Update when optimizing generation plans to meet future demand. The 2023 IRP identified twelve. The fourteen resources included stand-alone Battery, stand-alone Solar, CT units, NGCC units, OSW, and SMRs. Solar resources are modeled as PPA resources in addition to utility-owned resources.

The cost attributes of each of the fourteen resources available for selection by PLEXOS are listed in the table below. For candidate resources, the capital costs of the resources modeled in each plan have been escalated to the year that the generator is installed.

[Table begins on following page]

Table 12. Generation Supply Technology Costs, Escalation and Capacity Units and Supply Technology Characteristics

Available Resources	Capital Cost 2024 IRP Update ($/kW)	Escalation Rate	Capacity (MW)	Source Of Data
New 1x1 Combined Cycle	1,562	1.99%	650	Dominion Energy Project Construction Group
New 2x1 Combined Cycle	1,226	1.99%	1325	Dominion Energy Project Construction Group
New 2x1 Combined Cycle 50 Shared	1,226	1.99%	662	Dominion Energy Project Construction Group
New 3x1 Combined Cycle	1,022	1.99%	1950	Dominion Energy Project Construction Group
New CT Aero 2x	2,484	1.99%	104	Dominion Energy Project Construction Group
New CT Aero 1x	3,209	1.99%	52	Dominion Energy Project Construction Group
New CT Aero 1x 100% Hydrogen	3,812	1.99%	52	Dominion Energy Project Construction Group
New CT Frame 1x	1,706	1.99%	201	Dominion Energy Project Construction Group
New CT Frame 2x	1,471	1.99%	402	Dominion Energy Project Construction Group
New Small Modular Reactor	12,335	1.99%	274	Dominion Energy Project Construction Group
New Solar	1,375	2.50%	75	NREL 2023 ATB
New Solar PPA	1,375	2.50%	75	NREL 2023 ATB
New Battery 4 hour	1,784	2.50%	100	NREL 2023 ATB
New Offshore Wind	4,135	2.50%	100	NREL 2023 ATB

In the 2024 IRP Update, DESC has continued to follow its commitment to use NREL cost data for forecasting the cost of renewables. All prices for renewables have been updated with nominal prices calculated from the NREL 2023 Annual Technology Baseline ("ATB"). DESC modeled the Solar Production Tax Credits ("PTCs") consistent with the ATB.

XVI. BUILD PLAN ANALYSIS

In preparing the 2024 IRP Update, DESC analyzed five Core Build Plans under a range of policy considerations and future conditions in the energy markets, resulting in the consideration of fifteen Core Cases. Each of the Core Build Plans represents a different generation supply plan that optimizes results for customers under different assumptions concerning fuel costs, CO_2 costs, load growth, DSM results, and replacement resources for retired coal units. DESC quantified the costs, CO_2 emissions, and other impacts of these Core Build Plans by creating fifteen Core Cases to evaluate alternatives for meeting customers' energy needs reliably, affordably, and responsibly. DESC added five Sensitivity Cases to this analysis to assess the effect of alternative assumptions about future fuel and CO_2 costs, market conditions and load growth. The Company also modeled two Supplemental Cases to test assumptions regarding the potential impact on DESC's generation planning from the EPA's GHG rulemaking proposal and the effects of delayed retirements of Wateree and Williams at alternative dates.

A. The Five Core Build Plans

DESC selected five Build Plans for detailed analysis, based on updated inputs. They include the Updated 2023 Reference Build Plan, the 2024 Reference Build Plan, the Zero Carbon Cost Build Plan, the High Fossil Fuel Prices Build Plan, and the 85% CO_2 Reduction Build Plan.

Table 13. The Five Core Build Plans

The Five Core Build Plans			
Build Plan	**Optimization Market Scenario**	**Additional Constraints**	**Notes**
1. Updated 2023 Reference Build Plan	Reference Market Scenario	Includes a previously optimized build plan	This Build Plan was optimized in the 2023 IRP Reference Market Scenario, accepted as the 2023 IRP Preferred Build Plan, and is carried forward to this update as a Core Build Plan. Due to a higher load forecast, needed resources were added by optimizing in the 2024 Reference Market Scenario.
2. 2024 Reference Build Plan	Reference Market Scenario	None	PLEXOS crafted this Build Plan to perform best under the Reference Market Scenario, which generally reflects a middle-of-the-road outlook for key market drivers. It is the expected case for the 2024 IRP Update.
3. Zero Carbon Cost Build Plan	Zero Carbon Cost Market Scenario	None	PLEXOS created this Build Plan using the Zero Carbon Cost Market Scenario, which assumes future policy makers do not prioritize decarbonizing the energy sector. CO_2 prices remain at zero, fossil fuel prices are moderate, and electrification does not dramatically increase load growth.
4. High Fossil Fuel Prices Build Plan	High Fossil Fuel Prices Market Scenario	None	This Build Plan optimizes resource additions under the High Fossil Fuel Prices Market Scenario, which assumes high fossil fuel prices, moderate levels of electric demand growth, and moderate CO_2 costs.
5. 85% CO_2 Reduction Build Plan	Reference Market Scenario	Reduction of Carbon Emissions of approximately 85% by 2050	This Build Plan is also based on the Reference Market Scenario but requires DESC to achieve a reduction in CO_2 emissions of 85% by 2050 to be accomplished in stages beginning in 2031.

B. The Non-Core Build Plans

The seven Non-Core Build Plans serve as sensitivities to evaluate the potential effects on DESC's generation plans of changes in fuel cost, CO_2 costs, load growth, and DSM effectiveness, delays in Wateree and Williams retirements, the implementation of the GHG rules as currently proposed, and other statutorily or Commission-mandated assumptions.

Table 14. The Non-Core Build Plans

The Non-Core Build Plans			
Build Plan	**Market Scenario Used for Optimization**	**Additional Constraints**	**Notes**
1. Electrification Build Plan	Electrification Market Scenario	None	PLEXOS optimized this Build Plan under the Electrification Market Scenario, which assumes that policy makers incentivize electrification while keeping fossil fuel costs low and CO_2 costs at zero.
2. Energy Conservation Build Plan	Energy Conservation Market Scenario	None	PLEXOS optimized this Build Plan under the Energy Conservation Market Scenario, which assumes future policies disfavor reliance on fossil fuel through constraints on production of fossil fuels and gas pipelines, but efficiency displaces load growth due to electrification and electric load growth is low.
3. Aggressive Regulation Build Plan	Aggressive Regulation Market Scenario	None	The Aggressive Regulation Market Scenario is the basis for this Build Plan and assumes high fossil fuel costs, high CO_2 costs, and high load growth rates. This creates strong cost pressures on fossil fuel resources while load growth puts a premium on capacity and capacity additions.

4. High DSM Build Plan	Reference Market Scenario	DSM Programs attain the Maximum Achievable Potential	This Build Plan assumes DSM programs are able to achieve their Maximum Achievable Potential as shown in the 2023 DSM Potential Study, not the lower figure assumed in the Reference Market Scenario. It is otherwise optimized under the Reference Market Scenario.
5. Low DSM Build Plan	Reference Market Scenario	DSM Programs Do Not Achieve the Achievable Potential	This Build Plan assumes that DSM programs are only able to achieve 90% of their Achievable Potential as Shown in the 2023 DSM Potential Study but is otherwise optimized under the Reference Market Scenario.
6. Proposed GHG Rule Build Plan	Reference Market Scenario	Capacity Factor limits are applied to thermal units	This Build Plan evaluates the potential impact from a limited implementation of Phase 1 Section 111 EPA Green House Gas Proposed Rule. With that assumption, PLEXOS optimized the system under the Reference Market Scenario.
7. Retirements – 2032/2034 Build Plan	Reference Market Scenario	Wateree and Williams are retired in 2032 and 2034, respectively	This Build Plan evaluates the potential impact from delays in the retirement of Wateree and Williams by four years. With that assumption, PLEXOS optimized the system under the Reference Market Scenario.

C. The Percentage of Renewable Resources Selected in Core Build Plans

In the updated evaluation, the Core Build Plans add renewable or other non-emitting resources that equal between 74% and 89% of generation additions over the planning horizon. The 85% CO_2 Reduction Build Plan adds the most non-emitting resources, 10,622 MW or 89%. In addition to Solar, the 85% CO_2 Build Plan envisions adding 800 MW of offshore wind in 2035 and three 274 MW SMRs (in years 2040, 2045, and 2050).

The 2024 Reference Build Plan adds 7,100 MW of non-emitting resources or 83% of the total MW added under that Build Plan while the Zero Carbon Cost Plan adds 4,625 MW or 76%.

The Updated 2023 Reference Build Plan adds the least non-emitting resources at 6,625 MW or 74% of the total MW added.

D. MWs Added by the Core Build Plans

For comparability purposes, the Core Build Plans have the same load growth assumptions which allows the levelized costs and CO_2 emissions of each Core Build Plan to be compared directly to the others. Of the five Core Build Plans, the 85% CO_2 Reduction Build Plan adds the greatest amount of generating resources by nameplate capacity (11,947 MW) and non-emitting resources (10,622 MW). The Zero Carbon Cost Build Plan adds the least amount of generating resources (6,091 MW) and non-emitting resources (4,625 MW). The other Core Build Plans add relatively similar amounts of total generating resources - between 8,566 MW (the 2024 Reference Plan) and 9,091 MW (the High Fossil Fuel Prices Build Plan).

E. Fossil Fuel Resources Added by the Core Build Plans

As was the case in the 2023 IRP, under each of the Core Build Plans an affordable solution to maintaining system reliability requires adding dispatchable natural gas-fired generation. The amount of natural gas-fired generation added is greatest in the Updated 2023 Reference Build Plan (2,363 MW), is the same for the 2024 Reference Build Plan, the High Fossil Fuel Price Build Plan, and the Zero Carbon Cost Build Plan (1,466 MW), and is the least in the 85% CO_2 Reduction Build Plan (1,325 MW). The model makes very similar selections of natural gas-fired generators where Market Scenarios used similar load forecasts and selected natural gas-fired generation proportional to load growth in high and low load scenarios.

All Core Build Plans selected the Joint Resource to support retirement of Williams in 2031. Four of the five Core Build Plans add one or two Frame CTs in 2029 to support the retirement of Wateree. The 85% CO_2 Reduction Build Plan adds 600 MW of Battery in 2029 to support the

retirement of Wateree. In all the Core Build Plans, between 200 MW and 600 MW of Battery and between 1,125 MW and 1,800 MW of Solar resources are installed between 2026 and 2031.

F. The Specific Resources Added under Each Core Build Plan

The timing and nature of resource additions and the resulting capacities and winter reserve margins for each of the years of the model horizon for all Build Plans are set forth in the full detail in the tables attached as **Appendix D** to this document.

G. The Updated 2023 Reference Build Plan Resources

The Updated 2023 Reference Build Plan builds a total of 8,988 MW of capacity over the planning horizon which puts it in the middle of the range of new capacity constructed under the Core Build Plans. It adds 5,025 MW of Solar supplemented by a total of 1,600 MW of new Battery storage of which 400 MW is added in 2029 with a two-unit Frame CT ("New Frame CT 2x") to support the Wateree and, later, the Williams replacement. PPA and utility solar is built in increments between 150 MW and 300 MW beginning in 2026 and continuing for each year thereafter until the final year of the plan. The Updated 2023 Reference Build Plan selects the Joint Resource, in its 662 MW configuration, as the primary asset supporting the needs of the system in 2031 when both Wateree and Williams have retired.

To support system reliability and load growth, the Updated 2023 Reference Build Plan also adds a 52 MW aeroderivative capacity in 2032, 523 MW of new Frame CT capacity in 2040 and 2049, and 402 MW of new Frame CT in year 2045 as a dual unit project.

[Table begins on following page]

Table 15. The Updated 2023 Reference Build Plan

Updated 2023 Reference Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	150	0	0	0	0
2027	4937	6334	28.3	0	225	0	0	0	0
2028	5041	6351	26.0	0	300	0	0	0	0
2029	5116	6229	21.8	201	300	400	0	0	-684
2030	5178	6253	20.8	0	300	0	0	0	0
2031	5249	6328	20.6	662	300	0	0	0	-610
2032	5310	6398	20.5	52	300	0	0	0	0
2033	5351	6496	21.4	0	300	100	0	0	0
2034	5390	6760	25.4	0	300	300	0	0	0
2035	5435	6767	24.5	0	300	0	0	0	0
2036	5477	6923	26.4	0	300	300	0	0	0
2037	5524	6925	25.4	0	150	0	0	0	0
2038	5576	6792	21.8	0	150	0	0	0	0
2039	5634	6894	22.4	0	150	200	0	0	0
2040	5692	7418	30.3	523	150	0	0	0	0
2041	5755	7421	29.0	0	150	0	0	0	0
2042	5818	7423	27.6	0	150	0	0	0	0
2043	5877	7424	26.3	0	150	0	0	0	0
2044	5941	7487	26.0	402	150	0	0	0	0
2045	6006	7489	24.7	0	150	0	0	0	0
2046	6071	7492	23.4	0	150	0	0	0	0
2047	6137	7543	22.9	0	150	100	0	0	0
2048	6204	7556	21.8	0	150	200	0	0	0
2049	6271	7823	24.8	523	150	0	0	0	0
2050	6339	7819	23.3	0	0	0	0	0	0

H. 2024 Reference Build Plan Resources

The 2024 Reference Build Plan adds a total of 8,566 MW over the planning horizon including 5,100 MW of new Solar supported by a total of 2,000 MW of new Battery. This Build

Plan adds Solar in 300 MW increments beginning in 2026 and continuing through 2042. The 2024 Reference Build Plan replaces Wateree and Williams in part through 402 MW of Frame CT capacity built in 2029 and 662 MW Joint Resource built in 2031. To ensure system reliability, it adds 402 MW of new Frame CT in year 2045 as a dual unit project.

[Table begins on following page]

Table 16. The 2024 Reference Build Plan

2024 Reference Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6176	20.7	402	300	100	0	0	-684
2030	5178	6285	21.4	0	300	100	0	0	0
2031	5249	6360	21.2	662	300	0	0	0	-610
2032	5310	6378	20.1	0	300	100	0	0	0
2033	5351	6476	21.0	0	300	0	0	0	0
2034	5390	6486	20.3	0	300	0	0	0	0
2035	5435	6577	21.0	0	300	100	0	0	0
2036	5477	6668	21.7	0	300	100	0	0	0
2037	5524	6671	20.8	0	300	0	0	0	0
2038	5576	6709	20.3	0	300	0	0	0	0
2039	5634	6796	20.6	0	300	0	0	0	0
2040	5692	6854	20.4	0	300	0	0	0	0
2041	5755	6912	20.1	0	300	0	0	0	0
2042	5818	7025	20.7	0	300	100	0	0	0
2043	5877	7080	20.5	0	0	100	0	0	0
2044	5941	7136	20.1	0	0	200	0	0	0
2045	6006	7484	24.6	402	0	200	0	0	0
2046	6071	7486	23.3	0	0	100	0	0	0
2047	6137	7486	22.0	0	0	300	0	0	0
2048	6204	7483	20.6	0	0	100	0	0	0
2049	6271	7537	20.2	0	0	200	0	0	0
2050	6339	7642	20.6	0	0	200	0	0	0

I. The High Fossil Fuel Prices Build Plan

The High Fossil Fuel Prices Build Plan adds a total of 9,091 MW over the planning horizon including 5,625 MW of new Solar supported by a total of 2,000 MW of new Battery. This Build

Plan adds Solar in 300 MW increments beginning in 2026 and continuing through 2044. The High Fossil Fuel Prices Build Plan replaces Wateree and Williams in part through 402 MW of Frame CT capacity built in 2029 and 662 MW Joint Resource built in 2031. To ensure system reliability, it adds 402 MW of new Frame CT in year 2045 as a dual unit project.

Table 17. The High Fossil Fuel Prices Build Plan

High Fossil Fuel Prices Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6176	20.7	402	300	100	0	0	-684
2030	5178	6285	21.4	0	300	100	0	0	0
2031	5249	6360	21.2	662	300	0	0	0	-610
2032	5310	6378	20.1	0	300	100	0	0	0
2033	5351	6476	21.0	0	300	0	0	0	0
2034	5390	6486	20.3	0	300	0	0	0	0
2035	5435	6577	21.0	0	300	100	0	0	0
2036	5477	6668	21.7	0	300	100	0	0	0
2037	5524	6671	20.8	0	300	0	0	0	0
2038	5576	6709	20.3	0	300	0	0	0	0
2039	5634	6796	20.6	0	300	0	0	0	0
2040	5692	6854	20.4	0	300	0	0	0	0
2041	5755	6912	20.1	0	300	0	0	0	0
2042	5818	7025	20.7	0	300	100	0	0	0
2043	5877	7081	20.5	0	300	100	0	0	0
2044	5941	7138	20.2	0	225	200	0	0	0
2045	6006	7486	24.6	402	0	200	0	0	0
2046	6071	7488	23.3	0	0	100	0	0	0
2047	6137	7489	22.0	0	0	300	0	0	0
2048	6204	7485	20.7	0	0	100	0	0	0
2049	6271	7539	20.2	0	0	200	0	0	0
2050	6339	7645	20.6	0	0	200	0	0	0

J. The Zero Carbon Cost Build Plan Resources

The Zero Carbon Cost Build Plan adds a total of 6,091 MW of capacity to the system over the planning horizon including 2,625 MW of new Solar supported by 2,000 MW of new Battery. It is the least construction-intensive of the Core Build Plans. This Build Plan adds Solar on an annual basis beginning in 2028 and continuing through 2036. The Zero Carbon Cost Build Plan Build Plan replaces Wateree and Williams in part through 402 MW of Frame CT capacity built in 2029 and 662 MW Joint Resource built in 2031. To ensure system reliability, it adds 402 MW of new Frame CT in year 2038 as a dual unit project.

[Table begins on following page]

Table 18. The Zero Carbon Cost Build Plan

Zero Carbon Cost Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6306	29.5	0	0	0	0	0	0
2027	4937	6332	28.3	0	0	0	0	0	0
2028	5041	6348	25.9	0	225	0	0	0	0
2029	5116	6173	20.7	402	300	100	0	0	-684
2030	5178	6282	21.3	0	300	100	0	0	0
2031	5249	6357	21.1	662	300	0	0	0	-610
2032	5310	6460	21.7	0	300	100	0	0	0
2033	5351	6473	21.0	0	300	0	0	0	0
2034	5390	6482	20.3	0	300	0	0	0	0
2035	5435	6574	21.0	0	300	100	0	0	0
2036	5477	6664	21.7	0	300	100	0	0	0
2037	5524	6666	20.7	0	0	0	0	0	0
2038	5576	6934	24.4	402	0	0	0	0	0
2039	5634	6935	23.1	0	0	0	0	0	0
2040	5692	6936	21.9	0	0	0	0	0	0
2041	5755	6938	20.6	0	0	0	0	0	0
2042	5818	7024	20.7	0	0	100	0	0	0
2043	5877	7109	21.0	0	0	100	0	0	0
2044	5941	7195	21.1	0	0	200	0	0	0
2045	6006	7251	20.7	0	0	200	0	0	0
2046	6071	7308	20.4	0	0	100	0	0	0
2047	6137	7419	20.9	0	0	300	0	0	0
2048	6204	7470	20.4	0	0	100	0	0	0
2049	6271	7579	20.9	0	0	200	0	0	0
2050	6339	7630	20.4	0	0	200	0	0	0

K. The 85% CO_2 Reduction Build Plan Resources

The 85% CO_2 Reduction Build Plan builds 11,947 MW of capacity over the planning horizon making it the most construction-intensive of the Core Build Plans. From 2026 until 2050,

it adds 300 MW of new Solar each year for a total of 7,500 MW by 2050 and a total of 1,500 MW of Battery from 2029-2050. The 85% CO_2 Reduction Build Plan replaces Wateree and Williams in part through 600 MW of Battery built in 2029 and 1,325 MW of gas-fired generation built in 2031. It envisions adding no gas-fired generation after 2031 and instead envisions adding 800 MW of OSW in 2035 and 822 MW of SMRs beginning in 2040.

[Table begins on following page]

Table 19. The 85% CO_2 Reduction Build Plan

85% CO_2 Reduction Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6176	20.7	0	300	600	0	0	-684
2030	5178	6285	21.4	0	300	0	0	0	0
2031	5249	6360	21.2	1325	300	0	0	0	-610
2032	5310	6378	20.1	0	300	0	0	0	0
2033	5351	6476	21.0	0	300	0	0	0	0
2034	5390	6486	20.3	0	300	0	0	0	0
2035	5435	6812	25.3	0	300	0	800	0	0
2036	5477	6818	24.5	0	300	0	0	0	0
2037	5524	6821	23.5	0	300	0	0	0	0
2038	5576	6774	21.5	0	300	0	0	0	0
2039	5634	6776	20.3	0	300	0	0	0	0
2040	5692	6864	20.6	0	300	0	0	274	0
2041	5755	6952	20.8	0	300	0	0	0	0
2042	5818	7040	21.0	0	300	0	0	0	0
2043	5877	7126	21.3	0	300	0	0	0	0
2044	5941	7184	20.9	0	300	200	0	0	0
2045	6006	7241	20.6	0	300	0	0	274	0
2046	6071	7355	21.1	0	300	200	0	0	0
2047	6137	7412	20.8	0	300	200	0	0	0
2048	6204	7465	20.3	0	300	100	0	0	0
2049	6271	7572	20.7	0	300	100	0	0	0
2050	6339	7624	20.3	0	300	100	0	274	0

L. The Core Analysis

As it did in the 2023 IRP, DESC modeled the five Core Build Plans under the three Core Market Scenarios to create fifteen Core Cases. To allow for costs and emissions to be compared

on an equal basis, all three Core Market Scenarios assume the same level of customer demand, specifically all assume Reference Load Growth and a medium level of cost-effective DSM.

The Reference Market Scenario and the Zero Carbon Cost Market Scenario include medium expectations for fuel prices, while the High Fossil Fuel Prices Market Scenario assumes high fuel prices. The Reference Market Scenario and High Fossil Fuel Prices Market Scenario both assume medium expectations for CO_2 prices (a price of $20.70 per metric ton imposed in 2036 and escalating at 8%), while the Zero Carbon Cost Market Scenario assumes zero CO_2 prices.

DESC has measured the results of the five 2024 Core Build Plans across the fifteen Core Cases to show their relative performance in levelized cost, CO_2 emissions, incorporation of clean energy, fuel cost resiliency, generation diversity, reliability factors, mini-max regret factors, and a cost range analysis.

1. Levelized Cost

The Levelized Cost metric measures the costs to customers of each of the Core Build Plans based on the thirty-year levelized net present value ("LNPV") of the incremental costs of each Build Plan. The Levelized Cost Comparison of all twenty-two cases is attached as **Appendix H**. The following table shows the Levelized Cost Comparison of the Core Build Plans. The results are color coded: 1. Green = Least Cost, 2. Light Green = Second, 3. Yellow = Third, 4. Orange = Fourth and 5. Red = Highest Cost.

[Table begins on following page]

Table 20. Levelized Cost Comparison of the Core Build Plans (30-Year LNPV in Thousands of Dollars)

Core Build Plans 30 Yr Level NPV ($M)			
	Market Scenario		
Build Plans	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	2,279	2,496	2,048
2024 Reference Build Plan	2,181	2,393	1,958
High Fossil Fuel Prices Build Plan	2,179	2,389	1,961
Zero Carbon Cost Build Plan	2,206	2,449	1,934
85% CO_2 Reduction Build Plan	2,502	2,666	2,375

The LNPV cost rankings of the Core Build Plans are generally consistent among the Core Market Scenarios. The 2024 Reference Build Plan and the High Fossil Fuel Cost Build Plan are either the first or second most cost-effective Core Build Plans in all but one case. The Zero Carbon Cost Build Plan is the third lowest cost in most cases and the 85% CO_2 Build Plan is consistently the highest cost plan across all Core Market Scenarios. This result is consistent with the sensitivity analysis conducted on the Proposed GHG Rule Build Plan, which is the other carbon-constrained Build Plan, which shows similarly higher comparative costs.

[Table begins on following page]

Table 21. Percentage Difference in NPV from Reference Build Plan

Core Build Plans Reference 2023 %△			
	Market Scenario		
Build Plans	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	0.0%	0.0%	0.0%
2024 Reference Build Plan	-4.3%	-4.2%	-4.4%
High Fossil Fuel Prices Build Plan	-4.4%	-4.3%	-4.2%
Zero Carbon Cost Build Plan	-3.2%	-1.9%	-5.6%
85% CO_2 Reduction Build Plan	9.8%	6.8%	16.0%

The LNPV costs of the 2024 Reference Build Plan shows significant savings in all three Market Scenarios as compared to the Updated 2023 Reference Build Plan. This is due to the improved selection and timing of candidate resources that was made possible by optimizing a new reference Build Plan under the updated load forecast and other inputs. The 2024 Reference Build plan is effectively tied for lowest cost in both the Reference and High Fossil Fuel Prices Market Scenarios, indicating that it will perform well under middle-of-the-road assumptions or in environments where reliance on fossil fuels has become significantly more expensive than forecasts indicate. The 85% CO_2 Build Plan is the highest cost Core Build Plan with LNPV costs 9.8% more than the Updated 2023 Reference Build Plan.

The following table summarizes the rankings of the Core Build Plans under the three Core Market Scenarios.

Table 22. Levelized Cost Ranking of the Core Build Plans

Core Build Plans			
30 Yr LNPV			
	Market Scenario		
Build Plans	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	4	4	4
2024 Reference Build Plan	2	2	2
High Fossil Fuel Prices Build Plan	1	1	3
Zero Carbon Cost Build Plan	3	3	1
85% CO_2 Reduction Build Plan	5	5	5

2. CO_2 Emissions

Each of the Core Build Plans complies with all current environmental regulations on CO_2 and other air emissions of electric generating stations, and after offsetting all increases due to customer load growth since 2005, each results in DESC reducing its CO_2 emissions by at least 43.9% compared to emissions in that year.

As it did in the 2023 IRP, under the Reference Market Scenario, the 85% Carbon Reduction Build Plan results in the greatest reductions of CO_2 emissions (84.6%) compared to the 2005 levels. The other four Build Plans resulted in reductions between 43.9% and 58.0%.

[Table begins on following page]

Table 23. 2050 CO_2 Reductions for the Core Build Plans Compared to 2005 Levels

Core Build Plans 2050 CO_2 Reductions Compared to 2005 Levels			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	54.9%	54.9%	54.7%
2024 Reference Build Plan	56.3%	56.3%	56.2%
High Fossil Fuel Prices Build Plan	58.0%	58.0%	57.9%
Zero Carbon Cost Build Plan	44.1%	44.1%	43.9%
85% CO_2 Reduction Build Plan	84.6%	84.6%	84.6%

The Updated 2023 Reference Build Plan has the second to lowest reductions and the 2024 Reference Build Plan is a close third. The variation between the 85% CO_2 Reduction Build Plan and the 2024 Reference Build Plan is approximately 28 percentage points of additional reduction under the 85% CO_2 Reduction Build Plan.

The following table provides annual CO_2 emissions in thousands of tons for the Core Build Plans as forecasted in 2050 at the end of the planning horizon:

[Table begins on following page]

Table 24. 2050 CO_2 Emissions (Ktons) of the Core Build Plans

Core Build Plans 2050 CO_2 Emissions (Ktons) of the Core Build Plans			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	8,560	8,556	8,587
2024 Reference Build Plan	8,291	8,286	8,315
High Fossil Fuel Prices Build Plan	7,972	7,967	7,996
Zero Carbon Cost Build Plan	10,602	10,600	10,650
85% CO_2 Reduction Build Plan	2,925	2,924	2,925

As expected, the 85% CO_2 Reduction Build Plan provides the most carbon emission reductions, and the Zero Carbon Cost Build Plan has the least. The following table shows the percentage variation in CO_2 emissions of the Core Build Plans as forecasted at the end of 2050 using the Reference Build Plan as the point of comparison.

[Table begins on following page]

Table 25. 2050 CO_2 Emissions Variation in the Core Build Plans from the Reference 2023 Build Plan

Core Build Plans 2050 CO_2 Emissions Variation from the Reference 2023 Case			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	0.0%	0.0%	0.0%
2024 Reference Build Plan	-3.1%	-3.2%	-3.2%
High Fossil Fuel Prices Build Plan	-6.9%	-6.9%	-6.9%
Zero Carbon Cost Build Plan	23.9%	23.9%	24.0%
85% CO_2 Reduction Build Plan	-65.8%	-65.8%	-65.9%

DESC has also compared the cumulative CO_2 emissions under the Core Build Plans over the planning horizon (2024 to 2050). The lowest cumulative emissions come under the 85% CO_2 Reduction Build Plan and the highest under the Zero Carbon Cost Build Plan.

[Table begins on following page]

Table 26. Cumulative CO_2 Emissions (Ktons) of the Core Build Plans

Core Build Plans Cumulative CO_2 Emissions (Ktons)			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	208,725	225,326	208,037
2024 Reference Build Plan	201,741	218,312	201,168
High Fossil Fuel Prices Build Plan	199,890	216,415	199,308
Zero Carbon Cost Build Plan	232,409	248,981	231,944
85% CO_2 Reduction Build Plan	154,883	166,037	155,009

But due to the timing of resource additions, the scope of the variation in cumulative emissions is much less than the variation in 2050 emissions as shown in the following table that shows percentage variation in cumulative emissions for each Build Plan compared to the Updated 2023 Reference Build Plan. CO_2 emissions data for all twenty-four cases is attached as **Appendix I**.

[Table begins on following page]

Table 27. Variation from Reference in Cumulative CO_2 Emissions of the Core Build Plans

Core Build Plans Cumulative CO_2 Variation from the Reference 2023 Case			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	0.0%	0.0%	0.0%
2024 Reference Build Plan	-3.3%	-3.1%	-3.3%
High Fossil Fuel Prices Build Plan	-4.2%	-4.0%	-4.2%
Zero Carbon Cost Build Plan	11.3%	10.5%	11.5%
85% CO_2 Reduction Build Plan	-25.8%	-26.3%	-25.5%

3. Clean Energy

The Clean Energy metric compares the Core Build Plans based on how much energy they produce from nuclear, green hydrogen, wind, solar, and hydro facilities. The Build Plan with the largest component of Clean Energy generation in 2050 is the 85% CO_2 Reduction Build Plan, at 86%, followed by the High Fossil Fuel Prices Build Plan at 54%, the 2024 Reference Build Plan at 52%, and the Zero Carbon Cost Build Plan at 36%. The Updated 2023 Reference Build Plan had the lowest component of Clean Energy in 2050 at 32%.

Measuring cumulative Clean Energy generated over the planning horizon (2024-2050) shows a similar result, with the 85% CO_2 Reduction Build Plan having the highest levels of cumulative Clean Energy production during that period, and the High Fossil Fuel Prices Build Plan taking second place.

Table 28. Clean Energy Produced by the Core Build Plans

Clean Energy					
Optimized Plan	2050 Clean Energy (GWh)	Percentage of 2050 Clean Energy	Cumulative Clean Energy (GWh)	Percentage of Cumulative Clean Energy	2050 Clean Energy Rank
Updated 2023 Reference Build Plan	10,733	32.44%	240,633	30.97%	5
2024 Reference Build Plan	17,127	51.52%	379,175	48.62%	3
High Fossil Fuel Prices Build Plan	17,888	54.22%	383,590	49.51%	2
Zero Carbon Cost Build Plan	12,077	36.34%	313,171	40.19%	4
85% CO_2 Reduction Build Plan	28,712	85.97%	463,046	59.37%	1

4. Fuel Cost Resiliency

Each of the Core Build Plans will result in a different mix of generating assets and fuel costs over the planning horizon. Fuel costs are a major component of the costs evaluated in the Levelized Cost analysis, but the variation in the level of fuel costs between Build Plans can be a rough measure of the degree to which Build Plans are susceptible to fuel cost risk.

[Table begins on following page]

Table 29. Levelized Net Present Value of Fuel Costs

Core Build Plan Levelized Net Present Value of Fuel Costs ($M)			
	Market Scenario		
Build Plan	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	$656	$871	$581
2024 Reference Build Plan	$643	$852	$570
High Fossil Fuel Prices Build Plan	$636	$844	$565
Zero Carbon Cost Build Plan	$734	$975	$648
85% CO_2 Reduction Build Plan	$546	$707	$499

The 85% CO_2 Reduction Build Plan has the lowest fuel cost in all three Market Scenarios. This is largely due to that Build Plan's reliance on renewables and SMRs. The High Fossil Fuel Prices Build Plan was optimized to perform well in a high fossil fuel cost environment and had the second lowest fuel cost of all the Core Build Plans. The 2024 Reference Build Plan is a close third. The Zero Carbon Cost Build Plan has the highest fuel cost in all three Market Scenarios reflecting the fact that the assumption of cheap and plentiful natural gas supplies on which that Build Plan is based results in higher levels of natural gas utilization compared to other Build Plans.

5. Generation Diversity

Because all Build Plans concentrate at least 31.7% of system assets in Solar resources, the percentage of Solar added drives the diversity score and the higher the percentage of Solar, the lower the level of generation diversity. The 85% CO_2 Reduction Build Plan has the highest concentration of solar-related resources (48.8%) and the lowest diversity score. The Zero Carbon

Cost Build Plan had the lowest concentration of solar (31.7%) and the highest diversity score. The MW of each generation type added by year for each Build Plan is provided in **Appendix D**.

Table 30. Generation Diversity (Diversity Score and Rank Order)

Core Build Plans Generation Diversity				
Market Scenario	**Build Plan**	**Highest Concentration**	**Most Concentrated Type of Generation**	**Ranking**
Reference	**Updated 2023 Reference Build Plan**	41.8%	Solar	2
Reference	**2024 Reference Build Plan**	43.6%	Solar	3
High Fossil Fuel Prices	**High Fossil Fuel Prices Build Plan**	45.6%	Solar	4
Zero Carbon Cost	**Zero Carbon Cost Build Plan**	31.7%	Solar	1
Reference	**85% CO_2 Reduction Build Plan**	48.8%	Solar	5

6. Reliability Analysis

The modeling software is configured to ensure that all Build Plans meet a common reliability standard and that the resources included in each Build Plan collectively meet the systems' seasonal planning reserve margin, including allowances for forced and scheduled outages and other reliability considerations. To provide an additional measure of reliability, and to support comparative evaluation of Build Plans, DESC has also devised a means of scoring the reliability contribution of each generation technology that is included in the Build Plans. To preclude double-counting, and in consultation with Stakeholders, DESC limited the reliability analysis to factors that are not otherwise considered in the generation and transmission models, specifically black start, fast start, geographic diversity, and proximity to load factors.

Table 31. Reliability Factors Considered in the Metric

Reliability Factor	Able to generate or shift energy and complement renewables.
Fast Start	The unit can respond from an offline condition and serve load in less than 10 minutes.
Geographic Diversity	The unit can be located in diverse locations and is not restricted by fuel infrastructure.
Proximity to Load	The unit has a compact footprint and low impact outside of the fence. It can often be sited near load centers.
Black Start	A generating unit which has the ability to be started quickly, without support from the system or is designed to remain energized without connection to the remainder of the system, with the ability to energize a bus, meeting the transmission operator's restoration plan needs for real and reactive power capability, frequency and voltage control, and that has been included in the transmission operator's restoration plan.

Under this analysis, the reliability contribution of each generation resource is as follows:

Table 32. Reliability Contributions of Generation Technologies

Reliability Contributions of Generation Technologies								
Potential Reliability Attribute[6]	**CC**	**Aero CT**	**Frame CT**	**Solar**	**Battery**	**SMR**	**Offshore Wind**	**Coal Units**
Black Start	No	Yes	Yes	No	No	No	No	No
Fast Start	No	Yes	Yes	No	Yes	No	No	No
Geographic Diversity	No	No	No	No	Yes	No	No	No
Proximity to Load	Yes	Yes	Yes	No	Yes	Yes	No	Yes[7]

[6] PPA terms, as-built specifications, or operational use case could impact each.
[7] Williams Station's location is near a major load center and provides essential reliability attributes in the Charleston metroplex. Wateree is not credited.

The results of the scoring show that each Build Plan makes a positive contribution to system reliability.

Table 33. Reliability Scores

Build Plans	Total Change in Reliability Factor (MW equivalent)	Rank
Updated 2023 Reference	**8473**	**1.00**
2024 Reference	**8464**	**3.00**
High Fossil Fuel Prices	**8464**	**3.00**
Zero Carbon Cost	**8464**	**3.00**
85% CO_2 Reduction	**6037**	**5.00**

Under this analysis, the Updated 2023 Reference Build Plan scored the highest. The High Fossil Fuel Prices Build Plan, 2024 Reference Build Plan, and the Zero Carbon Cost Build Plan tied in the next slot and the 85% CO_2 Reduction Build Plan had the lowest score.

7. Mini-Max Regret

The Mini-Max Regret metric assesses the potential under each Core Build Plan to incur higher costs than other Build Plans under the same Core Market Scenario. In this analysis, the High Fossil Fuel Prices Build Plan received the best Mini-Max Regret score with zero regrets score under two of the Core Market Scenarios and the third lowest regrets, $28 million, in the other. The 2024 Reference Build Plan was second with the second lowest regrets score in all three Core Market Scenarios and nearly tying for lowest in two of them.

[Table begins on following page]

Table 34. Mini-Max Regret Comparison, Core Build Plans in $ Millions

Core Build Plans			
Mini-Max Regrets LNPV ($million)			
	Market Scenario		
Build Plans	Reference	High Fossil Fuel Prices	Zero Carbon Cost
Updated 2023 Reference Build Plan	$99	$107	$114
2024 Reference Build Plan	$1	$3	$25
High Fossil Fuel Prices Build Plan	$0	$0	$28
Zero Carbon Cost Build Plan	$26	$60	$0
85% CO_2 Reduction Build Plan	$323	$277	$441

As was the case in the 2023 IRP, the updated analysis shows that the 85% CO_2 Reduction Build Plan presented the greatest financial risk to customers with the highest level of maximum regrets under each of the Core Market Scenarios. Its regret potential is an additional $323 million per year under the Reference Market Scenario, compared to the maximum regret for the 2024 Reference Build Plan of only $1 million. The Updated 2023 Reference Build Plan had the second highest level of maximum regrets under each of the Core Market Scenario with a regret potential of $99 million per year under the Reference Market Scenario. As shown in the tables, the Max Regret for the 85% CO_2 Reduction Build Plan is a $441 million annual increase in LNPV cost under the Zero Carbon Cost Market Scenario which is the highest Max Regret score by a wide margin.

[Table begins on following page]

Table 35. Comparison of the Regret Levels of the Core Build Plans

Core Build Plans Mini_Max Regret Analysis			
Build Plans	**Max Regret ($M)**	**Percent Greater than Reference 2024**	**Ranking**
Updated 2023 Reference Build Plan	$114	365%	4
2024 Reference Build Plan	$25	0%	1
High Fossil Fuel Prices Build Plan	$28	13%	2
Zero Carbon Cost Build Plan	$60	143%	3
85% CO_2 Reduction Build Plan	$441	1696%	5

8. Cost Range Analysis

The Cost Range Analysis calculates the spread between the lowest and highest cost for each Build Plan across the three Core Market Scenarios. It indicates the degree that a Build Plan is sensitive to changes in the assumptions that vary between each of the Core Market Scenarios. It does not compare Build Plans against each other and so does not indicate whether a Build Plan is either more or less cost effective or beneficial than any other.

As was the case in the 2023 IRP, this metric shows that the Build Plans with the highest renewables percentages received the best score. This reflects the large percentage of non-emitting resources they add that are not subject to changing assumptions concerning CO_2 prices or fuel costs and, as a result, the costs of those Build Plans vary little when those assumptions are changed. But, given the high capital cost of non-emitting resources, plans with higher levels of non-emitting resources can have the highest cost to customers. Of the five Core Build Plans, the Zero Carbon

Cost Build Plan has the highest cost range reflecting the fact that it is optimized to generate low costs when fuel costs are low and no CO_2 costs are imposed but incurs higher costs when these assumptions are changed.

Table 36. Cost Range Analysis (Rank Order and Cost Spread, Minimum to Maximum)

Core Build Plans Cost Range Analysis		
	Max Difference Between Scenarios ($M)	**Ranking**
Updated 2023 Reference Build Plan	449	4
2024 Reference Build Plan	435	3
High Fossil Fuel Prices Build Plan	428	2
Zero Carbon Cost Build Plan	515	5
85% CO_2 Reduction Build Plan	291	1

9. Core Build Plans Ranked Across All Metrics

Ranking each of the Core Build Plans against all eight metrics shows that, as would be expected, the 85% CO_2 Reduction Build Plan scores well on measures related to environmental concerns, specifically 2050 CO_2 Emissions, Cumulative CO_2 Emissions, and 2050 Clean Energy. This Build Plan emphasizes non-emitting resources which also garners it leading scores for Cost Range, indicating that its capital investment in non-emitting resources reduces future cost variability.

[Table begins on following page]

Table 37. Rankings of the Core Build Plans Against all Eight Metrics

Core Build Plans									
Rankings within All Metrics, Reference Case Where Applicable									
Core Build Plans	**30-Year LNPV**	**2050 CO_2**	**Cum. CO_2**	**2050 Clean Energy**	**Fuel Cost**	**Gen. Diversity**	**Reliability**	**Mini-Max Regret**	**Cost Range**
Updated 2023 Reference Build Plan	4	4	4	5	4	2	1	4	4
2024 Reference Build Plan	2	3	3	3	3	3	3	1	3
High Fossil Fuel Prices Build Plan	1	2	2	2	2	4	3	2	2
Zero Carbon Cost Build Plan	3	5	5	4	5	1	3	3	5
85% CO_2 Reduction Build Plan	5	1	1	1	1	5	5	5	1

But the 2024 Reference Build Plan scores quite well in metrics related to cost to customers, specifically it scores second lowest in the 30-Year LNPV of generation costs under all three Core Market Scenarios and in two of the three Market Scenarios the difference between it and the leading Build Plan is only 0.1%. It scores first in the Mini-Max Regrets metric, indicating that it is resilient under divergent market conditions.

Although the 85% CO_2 Reduction Build Plan has the best ratings related to CO_2 emissions, clean energy, and cost range, it is also the highest cost Build Plan with an annual LNPV cost to customers that is between $277 million and $441 million more than the lowest cost plan under each Core Market Scenario.

XVII. THE SUPPLEMENTAL CASES

All five Core Build Plans and all five Sensitivity Cases assume that DESC retires Wateree and Williams by December 31, 2028, and 2030, respectively, provided that the Company can resolve all regulatory, procurement and construction related requirements in time to ensure reliable replacement generation capacity is available by those dates. In the near term, DESC must make an important decision whether it will be possible to retire Wateree by December 31, 2028, otherwise it will be required to commit to procuring the technology needed to meet ELG deadlines.

As a sensitivity analysis, DESC modeled two new Supplemental Build Plans to evaluate the potential impact of delays in retiring Wateree and Williams if the 2028 and 2030 retirement dates should not be feasible or desirable and the potential impact from the EPA's GHG Rule. In modeling the Proposed GHG Rule Build Plan, DESC adjusted the Wateree and Williams retirement dates to respond to the capacity factor limitations that the initial versions of the rule would place on fossil generation units. Those limits would favor maintaining fossil units to be used less intensively rather than retiring older units earlier.

[Table begins on following page]

Table 38. GHG and Delayed Retirement Supplemental Cases

Supplemental Cases					
Build Plans	**30 Yr. Level NPV ($M)**	**2024 Reference % Diff.**	**Cumulative CO_2 (Ktons)**	**2050 CO_2 (Ktons)**	**CO_2 Reduction From 2005 Levels %**
2024 Reference Build Plan	2,181	0.0%	201,741	8,291	56%
Proposed GHG Rule Build Plan	2,213	1.5%	192,096	6,861	64%
Retirements - 2032/2034 Build Plan	2,191	0.5%	211,645	8,496	55%

A. The Retirements – 2032/2034 Supplemental Build Plan

To assess the cost risk to customers from delayed retirements, DESC modeled the Retirements – 2032/2034 Build Plan which assumes a hypothetical four-year delay in retirement dates for both Wateree and Williams (2032 and 2034, respectively). DESC modeled these hypothetical retirement dates under the Reference Market Scenario, making the results directly comparable to the 2024 Reference Build Plan. The modeling shows that, if the forecasted ELG investment were fully made and both Wateree and Williams were to remain online for an additional four years, the change in the LNPV cost to customers is only 0.5%. This cost increase is considered manageable if the alternative could be the prospect of operating an electrical system without the reserves needed to serve customers reliably in extreme weather conditions or in the face of unexpected plant or transmission outages.

The Retirements – 2032/2034 Build Plan is similar in aggregate to the 2024 Reference Build Plan, but the delayed retirements result in the model adding the Joint Resource first and CT capacity later, while other Build Plans reverse the order of additions. Under the Retirements –

2032/2034 Build Plan, Wateree is replaced in 2032 by the 662 MW Joint Resource and Williams is replaced by adding 804 MW of Frame CTs in 2034. The Retirements – 2032/2034 Build Plan adds a total of 2,700 MW of solar from 2026-2034, but only 100 MW of Battery during that period, not 300 MW as under the 2024 Reference Build Plan.

[Table begins on following page]

Table 39. Retirements – 2032/2034 Build Plan

Retirements - 2032/2034 Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6373	24.6	0	300	0	0	0	0
2030	5178	6397	23.5	0	300	0	0	0	0
2031	5249	6420	22.3	0	300	0	0	0	0
2032	5310	6438	21.2	0	300	0	0	0	0
2033	5351	6429	20.2	662	300	0	0	0	-684
2034	5390	6524	21.0	0	300	100	0	0	0
2035	5435	6724	23.7	804	300	0	0	0	-610
2036	5477	6730	22.9	0	300	0	0	0	0
2037	5524	6733	21.9	0	300	0	0	0	0
2038	5576	6771	21.4	0	300	200	0	0	0
2039	5634	6773	20.2	0	300	0	0	0	0
2040	5692	6861	20.5	0	300	100	0	0	0
2041	5755	6949	20.7	0	300	100	0	0	0
2042	5818	7035	20.9	0	0	100	0	0	0
2043	5877	7120	21.2	0	0	100	0	0	0
2044	5941	7206	21.3	0	0	100	0	0	0
2045	6006	7262	20.9	0	0	100	0	0	0
2046	6071	7319	20.6	0	0	100	0	0	0
2047	6137	7375	20.2	0	0	100	0	0	0
2048	6204	7481	20.6	0	0	200	0	0	0
2049	6271	7535	20.2	0	0	200	0	0	0
2050	6339	7640	20.5	0	0	200	0	0	0

B. The Proposed GHG Rule Build Plan

To assess the cost risk to customers from the effects of the potential impact from the EPA's GHG Rule, DESC modeled the Proposed GHG Rule Build Plan under the Reference Market Scenario, making the results directly comparable to both the 2024 Reference Build Plan and the

85% CO_2 Reduction Build Plan. The Proposed GHG Rule Build Plan adds 11,166 MW of new or replacement generation over the planning horizon which is 2,600 MW or 30% more than the 2024 Reference Build Plan and the second highest amount of capacity added under any Build Plan. The 85% CO_2 Reduction Build Plan has the highest amount of capacity added (11,947 MW). Of the amount of new or replacement generation modeled under the Proposed GHG Rule Build Plan, 7,500 MW or 67% is Solar capacity which is 47% more Solar than is added by the 2024 Reference Build Plan and equivalent to the Solar capacity added by the 85% CO_2 Reduction Build Plan. Consistent with the 85% CO_2 Reduction Build Plan, the Proposed GHG Build Plan is the only other Build Plan that adds offshore wind (800 MW). The Proposed GHG Rule Build Plan adds 1,400 MW of Battery resources whereas the 2024 Reference Build Plan added 2,000 MW and the 85% CO_2 Reduction Build Plan added 1,500 MW.

The Proposed GHG Rule Build Plan assumes Wateree and Williams are retired in 2031 and 2034, respectively, which are the latest dates that the units could remain online after the limited implementation of Phase 1 Section 111 EPA Green House Gas Proposed Rule. The Proposed GHG Rule Build Plan replaces Wateree in 2031 in part through 402 MW of Frame CT capacity and 300 MW of Battery and replaces Williams in 2034 with the 662 MW Joint Resource. The Proposed GHG Rule Build Plans adds 402 MW of new Frame CT in year 2047 as a dual unit project whereas the 2024 Reference Build Plan adds a 402 MW dual unit Frame CT resource in 2045.

According to this modeling, implementation of the GHG Rule would only result in a 64% reduction in DESC's 2005 CO_2 emissions which is 21% less that the CO_2 reduction under the 85% CO_2 Reduction Build Plan. Therefore, the Proposed GHG Rule Build Plan is not the most stringent case for assessing the impact of potential CO_2 limitations on DESC's generation planning.

Table 40. Proposed GHG Rule Build Plan

Proposed GHG Rule Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6373	24.6	0	300	0	0	0	0
2030	5178	6397	23.5	0	300	0	0	0	0
2031	5249	6420	22.3	0	300	0	0	0	0
2032	5310	6411	20.7	402	300	300	0	0	-684
2033	5351	6509	21.6	0	300	100	0	0	0
2034	5390	6519	20.9	0	300	0	0	0	0
2035	5435	6897	26.9	662	300	0	800	0	-610
2036	5477	6903	26.0	0	300	0	0	0	0
2037	5524	6906	25.0	0	300	0	0	0	0
2038	5576	6774	21.5	0	300	0	0	0	0
2039	5634	6776	20.3	0	300	0	0	0	0
2040	5692	6864	20.6	0	300	100	0	0	0
2041	5755	6952	20.8	0	300	100	0	0	0
2042	5818	7040	21.0	0	300	100	0	0	0
2043	5877	7126	21.3	0	300	100	0	0	0
2044	5941	7184	20.9	0	300	100	0	0	0
2045	6006	7241	20.6	0	300	100	0	0	0
2046	6071	7300	20.2	0	300	100	0	0	0
2047	6137	7649	24.6	402	300	200	0	0	0
2048	6204	7592	22.4	0	300	0	0	0	0
2049	6271	7647	21.9	0	300	100	0	0	0
2050	6339	7644	20.6	0	300	0	0	0	0

XVIII. UPDATED SENSITIVITY BUILD PLANS

Data from the Sensitivity Build Plans allow generation planners to identify the changes that would be required to respond effectively to Market Scenarios which are less likely or less

representative of the range of possible conditions than the Core Market Scenarios. The 2024 Reference Build Plan is the suitable point of comparison for these Sensitivity Build Plans because it is optimized for the most likely set of future market conditions and it is the Preferred Plan as identified in this 2024 IRP Update.

A. The Electrification Build Plan and Market Scenario

The Electrification Market Scenario is a sensitivity that measures the effect on costs and CO_2 emissions of a major change in regulatory policy and societal pressure which drives the electrification of transportation and other end uses for energy while expanding fossil fuel supplies and not imposing CO_2 costs on electricity.

In total, the Electrification Build Plan adds 6,531 MW of new or replacement generation over the planning horizon which is 24% (2,035 MW) less than the amount added by the 2024 Reference Build Plan. As it did in the 2023 IRP, the Electrification Build Plan favors new natural gas generation and adds 73% more gas-fired generation (2,531 MW) than the 2024 Reference Build Plan. Of that amount, 52% (1,325 MW) is high efficiency, low emissions NGCC generation, and this is more than double the amount of NGCC resources being added under the 2024 Reference Build Plan. The Electrification Build Plan can supply 10.7% more energy than the 2024 Reference Build Plan (858,424 GWh vs. 822,661 GWh) even with its smaller portfolio of resources, largely because it can intensively use low-fuel cost gas-fired generation to supply energy needs economically.

Inexpensive energy from gas generation limits reliance on Solar under this Build Plan. The amount of Solar added (2,400 MW) represents only 37% of the generation resources added under this Build Plan compared to 60% under the 2024 Reference Build Plan (5,100 MW). Both Build Plans add significant amounts of Battery, 2,000 MW for the 2024 Reference Build Plan and 1,600 MW for the Electrification Build Plan.

Table 41. The Electrification Build Plan

Electrification Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4878	6306	29.3	0	0	0	0	0	0
2027	4973	6332	27.3	0	0	0	0	0	0
2028	5071	6347	25.2	0	0	0	0	0	0
2029	5170	6257	21.0	402	300	200	0	0	-684
2030	5271	6366	20.8	0	300	100	0	0	0
2031	5374	7103	32.2	1325	300	0	0	0	-610
2032	5479	7121	30.0	0	300	0	0	0	0
2033	5557	7135	28.4	0	300	0	0	0	0
2034	5637	7144	26.7	0	300	0	0	0	0
2035	5717	7151	25.1	0	300	0	0	0	0
2036	5799	7156	23.4	0	300	0	0	0	0
2037	5881	7158	21.7	0	0	0	0	0	0
2038	5965	7194	20.6	0	0	200	0	0	0
2039	6050	7280	20.3	0	0	100	0	0	0
2040	6137	7683	25.2	402	0	0	0	0	0
2041	6224	7685	23.5	0	0	0	0	0	0
2042	6313	7686	21.7	0	0	0	0	0	0
2043	6403	7771	21.4	0	0	100	0	0	0
2044	6496	8004	23.2	402	0	0	0	0	0
2045	6591	7920	20.2	0	0	0	0	0	0
2046	6687	8092	21.0	0	0	200	0	0	0
2047	6785	8178	20.5	0	0	100	0	0	0
2048	6884	8314	20.8	0	0	200	0	0	0
2049	6985	8423	20.6	0	0	200	0	0	0
2050	7087	8528	20.3	0	0	200	0	0	0

In the near- to mid-term (2024-2029), the Electrification Build Plan and the 2024 Reference Build Plan are quite similar in that both replace Wateree with 402 MW of CT resources but differ in that:

- The 2024 Reference Build Plan adds 300 MW of solar annually beginning in 2026 and the Electrification Build Plan does not begin adding solar annually until 2029, and
- The Electrification Build Plan adds 200 MW of Battery in 2029 while the 2024 Reference Build Plan adds only 100 MW.

Beyond 2029, both Build Plans add 1,400 MW of Battery but in different years. While both Build Plans replace Williams with the Joint Resource, the Electrification Build Plan replaces Williams with the Joint Resource in its 1,325 MW configuration while the 2024 Reference Build Plan replaces Williams with the Joint Resource in its 662 MW configuration. The similarities between these plans support the conclusion that DESC can shift from the 2024 Reference Build Plan to a Build Plan like the Electrification Build Plan with little disruption if future market and policy considerations so indicated.

As a result, the sensitivity analysis of the Electrification Build Plan continues to support the representative nature of the Core Build Plans, and specifically the resiliency the 2024 Reference Build Plan if environmental policies seek to drive electrification through readily available and reasonably priced natural gas supplies free from CO_2 emissions costs.

B. The Energy Conservation Build Plan and Market Scenario

DESC agreed to model the assumptions embedded in Energy Conservation Market Scenario as a concession to certain Stakeholders but does not believe those assumptions to be foreseeable or achievable. The Energy Conservation Market Scenario assumes that policy makers limit investments in new fossil fuel supplies and pipeline capacity in a way that significantly increases fuel prices, but without creating demand for electrification of transportation and other end uses at a level that would exceed the ability of conservation efforts to forestall load growth.

The Energy Conservation Market Scenario is based on the lowest load growth projection of any Market Scenario and assumes levels of DSM savings levels specific to DESC's service territory that are many times greater than any that the 2023 Potential Study determined to be obtainable. It also ignores the potential impact on demand of electrification of transportation and other end uses.

Under these assumptions, the Energy Conservation Build Plan adds 7,562 MW of capacity which is 12% less than the 2024 Reference Build Plan. Of this amount, 5,100 MW or 67% is Solar capacity. The only gas-fired generation added under the Energy Conservation Build Plan is the 662 MW Joint Resource built to replace Williams and the amount of total gas resources added is 55% less than under the 2024 Reference Build Plan. Both Plans involve adding substantial Battery resources, but the Energy Conservation Build Plan includes 200 MW less Battery than the 2024 Reference Build Plan reflecting lower assumptions concerning demand growth.

[Table begins on following page]

Table 42. The Energy Conservation Build Plan

Energy Conservation Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4830	6307	30.6	0	300	0	0	0	0
2027	4876	6335	29.9	0	300	0	0	0	0
2028	4923	6352	29.0	0	300	0	0	0	0
2029	4970	6029	21.3	0	300	400	0	0	-684
2030	5018	6053	20.6	0	300	0	0	0	0
2031	5065	6128	21.0	662	300	0	0	0	-610
2032	5114	6146	20.2	0	300	0	0	0	0
2033	5136	6244	21.6	0	300	100	0	0	0
2034	5158	6254	21.2	0	300	0	0	0	0
2035	5180	6260	20.9	0	300	0	0	0	0
2036	5202	6351	22.1	0	300	100	0	0	0
2037	5224	6354	21.6	0	300	0	0	0	0
2038	5246	6307	20.2	0	300	100	0	0	0
2039	5269	6394	21.4	0	300	100	0	0	0
2040	5291	6397	20.9	0	300	0	0	0	0
2041	5314	6400	20.4	0	300	0	0	0	0
2042	5336	6458	21.0	0	300	100	0	0	0
2043	5359	6458	20.5	0	0	0	0	0	0
2044	5382	6514	21.0	0	0	500	0	0	0
2045	5405	6515	20.5	0	0	0	0	0	0
2046	5428	6572	21.1	0	0	100	0	0	0
2047	5451	6572	20.6	0	0	0	0	0	0
2048	5474	6624	21.0	0	0	200	0	0	0
2049	5497	6678	21.5	0	0	100	0	0	0
2050	5520	6673	20.9	0	0	0	0	0	0

Despite the differences referenced above, the two Build Plans are quite similar during the period from 2024 until 2029 and with two only exceptions, the two Build Plans envision adding the same resources, in the same quantities and at the same time. One exception is that the Energy Conservation Build Plan replaces Wateree with 400 MW of Battery while the 2024 Reference

Build Plan replaces it with 402 MW Frame CT. The other exception is that the 2024 Reference Build Plan adds 100 MW of Battery in 2029 while the other Build Plan does not. Both Build Plans replace Williams in 2031 with the 662 MW Joint Resource.

The updated analysis of the Energy Conservation Build Plan shows that a combination of high fuel prices and extraordinarily low demand growth could support adding 300 MW of additional solar beginning 2026 and could justify DESC replacing Wateree with 400 MW of Battery resources instead of CT resources. But even under these extreme assumptions, the Joint Resource will be needed to replace Williams and significant Battery or other dispatchable resources will be needed to replace Wateree.

C. The Aggressive Regulation Build Plan and Market Scenario

The Aggressive Regulation Build Plan assumes that policy makers move aggressively to reduce CO_2 emissions by limiting fossil fuel supplies and pipeline access while imposing high costs on electric CO_2 emissions. At the same time, electric loads experience high growth as policy mandates and the high cost of alternative energy sources drive electrification.

To maintain affordability and reliability in the face of high electric demand, high fossil fuel prices and high CO_2 emissions costs, the Aggressive Regulation Build Plan requires 73% more generation capacity be added to the system than the 2024 Reference Build Plan (10,131 MW) and is second only to the 85% CO_2 Reduction Build Plan (11,947 MW) in this regard. Of the total generation added in the Aggressive Regulation Build Plan, 6,000 MW or 59% is Solar capacity which is 18% more Solar than is added by the 2024 Reference Build Plan. However, integrating this level of Solar capacity requires a significant amount of new natural gas generation and the Aggressive Regulation Build Plan adds 2,531 MW of gas fired generation, which is the largest amount of gas fired generation additions of any Build Plan. It adds 1,600 MW of Batteries while

the 2024 Reference Build Plan adds 2,000 MW. Both Build Plans envision replacing Williams with the 662 MW Joint Resource.

As a result of high fuel costs, the high number of MW added and the high capital costs of NGCC units, the Aggressive Regulation Build Plan has the highest retail rate impact of any Build Plan with a CAGR in retail rates that is 44% higher than the 2024 Reference Build Plan (3.06% vs 2.12%). But aggressive regulation results in only a marginal decrease in the cumulative percentage of clean energy generated over the planning horizon (45% vs 46%) and clean energy capacity added in 2050 is 1% lower (59% vs 60%) compared to the 2024 Reference Build Plan.

During the period 2024-2031, the construction program under Aggressive Regulation Build Plan diverges from the 2024 Reference Build Plan in only two respects. The Aggressive Regulation Build Plan adds 100 MW more Battery capacity in 2029 than the 2024 Reference Build Plan and replaces Williams with the Joint Resource in its 1,325 MW configuration while the 2024 Reference Build Plan replaces Williams with the Joint Resource in its 662 MW configuration. Both plans replace Wateree principally with a 402 MW Frame CT resource.

In the final analysis, the Aggressive Regulation Build Plan shows that even under extreme assumptions concerning fuel costs, demand growth, regulatory policy and electrification, the 2024 Reference Build Plan remains robust. Under both plans, replacing Williams will require the Joint Resource in either a larger or smaller version, and Wateree will be replaced with Frame CTs in combination with Battery. The similarities between these Build Plans between 2029 and 2031 support the conclusion that DESC could shift from the 2024 Reference Build Plan to a Build Plan like the Aggressive Regulation Build Plan if future market and policy considerations so indicate.

Table 43. The Aggressive Regulation Build Plan

Aggressive Regulation Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4878	6307	29.3	0	300	0	0	0	0
2027	4973	6335	27.4	0	300	0	0	0	0
2028	5071	6352	25.3	0	300	0	0	0	0
2029	5170	6261	21.1	402	300	200	0	0	-684
2030	5271	6370	20.9	0	300	100	0	0	0
2031	5374	7108	32.3	1325	300	0	0	0	-610
2032	5479	7126	30.1	0	300	0	0	0	0
2033	5557	7139	28.5	0	300	0	0	0	0
2034	5637	7149	26.8	0	300	0	0	0	0
2035	5717	7155	25.2	0	300	0	0	0	0
2036	5799	7161	23.5	0	300	0	0	0	0
2037	5881	7164	21.8	0	300	0	0	0	0
2038	5965	7202	20.7	0	300	200	0	0	0
2039	6050	7289	20.5	0	300	100	0	0	0
2040	6137	7377	20.2	0	300	100	0	0	0
2041	6224	7520	20.8	0	300	200	0	0	0
2042	6313	7633	20.9	0	300	200	0	0	0
2043	6403	7744	20.9	0	300	200	0	0	0
2044	6496	8039	23.7	402	300	0	0	0	0
2045	6591	7986	21.2	0	300	0	0	0	0
2046	6687	8043	20.3	0	0	100	0	0	0
2047	6785	8154	20.2	0	0	200	0	0	0
2048	6884	8552	24.2	402	0	0	0	0	0
2049	6985	8551	22.4	0	0	0	0	0	0
2050	7087	8546	20.6	0	0	0	0	0	0

D. The DSM Build Plans

As was the case in the 2023 IRP, all Core Build Plans modeled here are based on the Medium DSM forecast which assumes that DESC can achieve of a 0.51% energy sales reduction

(the Achievable Potential) through offering a revised and expanded portfolio of DSM programs with the revised measures and marketing plans identified in the 2023 Potential Study. The High DSM Build Plan assumes DSM programs achieve their Maximum Achievable Potential as shown in the 2023 DSM Potential Study, which was determined by ICF to be 0.74% reduction in energy sales. The Low DSM Build Plan assumes that DSM programs are only able to achieve 90% of the Achievable Potential as shown in the 2023 DSM Potential Study, which was determined to be 0.46% reduction in energy sales but is otherwise optimized under the Reference Market Scenario. To support comparability, both DSM Build Plans are optimized under the Reference Market Scenario apart from the different assumptions concerning load growth.

The updated analysis shows that the 2024 Reference Build Plan is slightly lower in LNPV cost than the Low DSM Build Plan and slightly higher than the High DSM Build Plan, but only by -0.63% and 0.32%, respectively. The resulting difference in the CAGR in retail rates among the DSM Sensitivities is only 0.65% and 1.65% (a CAGR of 2.11% for the High DSM Build Plan and 2.15% for the Low DSM Build Plan compared to 2.12% for the 2024 Reference Build Plan).

[Table begins on following page]

Table 44. DSM Build Plan Sensitivities, LNPV of Costs and Retail CAGR Compared Under the Reference Market Scenario

DSM Sensitivities LNPV ($M); CAGR %					
Build Plans	**30-Year LNPV**	**Difference in 30 Year LNPV**	**Percentage Difference**	**Retail CAGR over 15 Years**	**Percentage Difference**
Medium DSM	$2,181	$0	0	2.12%	0
High DSM	$2,167	-$14	-0.63%	2.11%	-0.65%
Low DSM	$2,188	$7	0.32%	2.15%	1.65%

As was the case in the 2023 IRP, the updated analysis shows that the DSM assumptions have little impact on carbon emissions over the planning horizon, reducing 2050 CO_2 emissions only by an additional 1.1% under the High DSM Build Plan and 0.4% Low DSM Build Plan. The Build Plans reduce cumulative CO_2 emissions by an additional 1.4% and 0.4%, respectively.

Table 45. DSM Sensitivities, Cumulative and 2050 CO_2 Emissions Compared Under the Reference Market Scenario

DSM Sensitivity Build Plans (M short tons)					
Build Plans	**30-Year Cumulative Emissions**	**Difference from Reference**	**Percentage Difference**	**2050 Emissions**	**Percentage Difference**
Medium DSM	201,741	0	0	8,291	0
High DSM	198,886	-2,856	-1.4%	8,201	-1.1%
Low DSM	200,977	-764	-0.4%	8,260	-0.4%

The Low DSM Build Plan adds slightly more Solar than the High DSM Build Plan (5,100 MW versus 4,950 MW) and slightly more Battery (2,100 MW versus 1,800 MW) and with the same level of Frame CT (804 MW). All three Build Plans, including the 2024 Reference Build Plan, add the same amount of NGCC (662 MW). The 2024 Reference Build Plan adds slightly more Solar than the High DSM Build Plan (5,100 MW) but is otherwise identical to the Low DSM Build Plan.

As in the 2023 IRP, the updated analysis shows that effective level of DSM programs over the planning horizon, from best to worst case scenario, will have very minor impacts on costs, CO_2 emissions, and the generation resources needed over the planning horizon.

XIX. EVALUATION OF A RANGE OF DEMAND FORECASTS

The DSM analysis provides an important data point concerning how different assumptions about load growth affect the resulting Build Plans. In addition, the 2024 Reference Build Plan, the Electrification Build Plan and the Energy Conservation Build Plan provide three Build Plans incorporating the Reference, High and Low load growth forecasts. These Build Plans assume different levels of fuel costs and CO_2 costs in addition to different assumptions as to base load growth since these factors are not independent variables but reflect certain policy choices and economic conditions that are to some degree interrelated. As discussed in the sections concerning Supplemental Build Plans, an updated analysis of these three Build Plans affirms that DESC's present approach to replacing the Wateree and Williams capacity, and other near term generation supply decisions including the amount of Solar capacity to add beginning in 2026, remains sound and appropriate under a range of load growth assumptions. The variation that they reflect in short to near-term Build Plans is fully considered in this analysis.

Because the 2024 IRP Update is a planning document based on a snapshot in time, DESC will continue to evaluate these decisions as timely information concerning energy conservation generally and the scope and effectiveness of DSM programs become available.

XX. THE PREFERRED PLAN

Based on a careful review of the needs of the electric system and the refreshed modeling contained in this 2024 IRP Update, DESC has determined that the 2024 Reference Build Plan is the preferred Build Plan to guide its resource planning decisions at this time. The 2024 Reference Build Plan is:

a. Essentially tied with the High Fossil Fuel Prices Build Plan as the low-cost option under the Reference Market Scenario and the High Fossil Fuel Costs Market Scenario, and is either the lowest or second lowest cost Build Plan under all 15 Core Cases,

b. Has the lowest Mini-Max Regrets score of any plan, and

c. Fares well in comparison to the Sensitivity Cases that assume markedly different future market conditions and policy choices.

This indicates that the 2024 Reference Build Plan is a robust and resilient plan that can protect customers' interests under a range of future market conditions.

Under the 2024 Reference Build Plan, the resource additions needed in the near to medium term are not fundamentally different from those envisioned under the High Fossil Fuel Prices Build Plan which is the 2024 Reference Build Plan's closest competitor in cost-related categories. For this reason, changing between plans if required should not be particularly disruptive. But the 2024 Reference Build Plan is preferable because the 2024 Reference Build Plan embodies the most

likely, middle-of-the-road assumptions as to fuel costs and other inputs, meaning that it is the plan most closely aligned with current forecasts of future market conditions.

The 85% CO_2 Reduction Build Plan outperforms the 2024 Reference Build Plan on most measures of CO_2 emissions reductions and clean energy, but its costs are higher than the 2024 Reference Build Plan and it has very high Mini-Max Regret scores, indicating that it is not robust across the current range of future market conditions and customers could be hurt significantly under some future market conditions. Both Build Plans add the same resources through 2032 and show only minor differences until 2035, and this provides flexibility for DESC to adjust towards a stringently carbon-constrained plan providing higher emissions reductions as future fuel and CO_2 costs, generating technologies and technology costs, and policy mandates evolve.

The Updated Reference 2023 Build Plan is the successor to the Build Plan that was selected as the preferred plan in the 2023 IRP. But the 2024 Reference Build Plan outperforms the Updated Reference 2023 Build Plan significantly, with better results on seven of nine metrics, including key metrics for costs to customers, CO_2 Emissions, Clean Energy and Mini-Max Regret.

In some cases, it may be advisable during an annual IRP update not to change from one preferred plan to another, if for example, the change is driven by a forecasted input that is highly volatile at the time, or otherwise seems unstable or unreliable. However, that is not the case here. The difference in modeling results between the Updated 2023 Reference Build Plan and the 2024 Reference Plan is due primarily to the recent addition to the forecast of 256 MW of contractually committed load from creditworthy parties. In some circumstances too, changing preferred plans may be ill advised because it would disrupt on-going design, engineering, or procurement activities. But here, the competing plans both involve the addition of similar resources in the near-term to medium-term, and planning is not disrupted by selecting a new plan. Accordingly, in this

2024 IRP Update, DESC adopts the 2024 Reference Build Plan as the Preferred Plan to guide its planning decisions at the present time.

XXI. FORECAST OF RENEWABLE GENERATION

All Core Build Plans include a significant amount of renewable energy—between 56% and 69% of total generation by the end of the forecast period in the Reference Market Scenario. As expected, the Zero Carbon Cost Build Plan adds the least amount of renewables under each market scenario. By way of contrast, the 85% CO_2 Reduction Build Plan adds the most renewables under each Market Scenario. The 2024 Reference Build Plan ranks fourth in renewable additions under each Market Scenario. The values in the table below show the total renewable generation by resource plan by five-year period under three market scenarios for the Core Build Plans. Similar data for the sensitivity and supplemental cases are provided in **Appendix E**.

[Table begins on following page]

Table 46. Energy from Renewable Generation by Five-Year Period

Energy from Renewable Generation by Five-Year Period (GWh)							
Build Plan	2024 - 2028	2029 - 2033	2034 - 2038	2039 - 2043	2044 - 2048	2049 - 2050	Total
Reference Market Scenario							
Reference 2023 Build Plan	11,374	10,869	11,755	18,421	25,428	10,904	88,751
Reference 2024 Build Plan	15,401	30,545	43,838	55,036	59,148	23,345	227,313
High Fossil Fuel Prices Build Plan	15,401	30,542	43,836	55,347	61,950	24,756	231,832
Zero Carbon Cost Build Plan	11,879	23,432	36,769	38,071	37,384	13,607	161,141
85% CO_2 Reduction Build Plan	15,398	30,888	54,865	65,843	70,905	31,320	269,220
High Fossil Fuel Prices Market Scenario							
Reference 2023 Build Plan	11,374	10,869	11,754	18,415	25,397	10,888	88,698
Reference 2024 Build Plan	15,385	30,492	43,750	55,043	59,150	23,349	227,170
High Fossil Fuel Prices Build Plan	15,387	30,489	43,755	55,350	61,967	24,759	231,707
Zero Carbon Cost Build Plan	11,879	23,428	36,731	38,074	37,384	13,607	161,104
85% CO_2 Reduction Build Plan	15,387	30,888	54,880	65,841	70,886	31,308	269,190
Zero Carbon Cost Market Scenario							
Reference 2023 Build Plan	11,374	10,869	11,757	18,416	25,403	10,874	88,693
Reference 2024 Build Plan	15,400	30,546	43,797	54,956	59,094	23,331	227,125
High Fossil Fuel Prices Build Plan	15,400	30,545	43,800	55,264	61,874	24,734	231,615
Zero Carbon Cost Build Plan	11,879	23,435	36,743	38,043	37,382	13,607	161,089
85% CO_2 Reduction Build Plan	15,400	30,889	54,818	65,810	71,023	31,328	269,269

XXII. RATE AND BILL IMPACTS

To show the impact of changes in levelized cost on customers, DESC has taken the levelized cost for each Core Build Plan and combined it with rate data to show the resulting changes in retail rates ("Retail Rates"), and changes in the monthly bill of a typical residential customer ("Customer Bills"). The typical residential customer for DESC is a Rate 8 customer using 1,000 kWh per month.

This rate and bill impact analysis incorporates changes in fuel costs, including CO_2 and other emissions costs from burning fuel, and the capital and operating cost of generation assets. But it does not attempt to model other factors that would change Retail Rates or Customer Bills over time and so is not a forecast of future rates and is not a comprehensive rate forecast. It covers a fifteen-year period and incorporates the annual costs of generation supply for each year of that period.

Fuel costs, CO_2 costs, and new generation projects are important drivers of both Retail Rates and Customer Bills. As was the case in the 2023 IRP, in most cases, the changes in fuel costs and CO_2 costs between the Market Scenarios drive Retail Rates and Customer Bills up or down in a consistent fashion, and Build Plans often maintain similar or same relative positions across the Market Scenarios. The factors that vary between Market Scenarios impact the cost to customers of Build Plans so strongly that comparing different Build Plans under different Market Scenarios does not provide meaningful information.

[Table begins on following page]

Table 47. Compound Annual Growth Rate and Total Change in a Typical Customers' Bill Under the Core Analysis Due to Generation Costs

Typical Residential Bill @1000 kWh/month			
Market Scenario	**Build Plan**	**CAGR**	**Total Change**
Reference	Reference 2023 Build Plan	2.49%	41.19%
Reference	Reference 2024 Build Plan	2.24%	36.44%
Reference	High Fossil Fuel Prices Build Plan	2.24%	36.42%
Reference	Zero Carbon Cost Build Plan	2.29%	37.33%
Reference	85% CO_2 Reduction Build Plan	2.65%	44.13%
High Fossil Fuel Prices	Reference 2023 Build Plan	2.90%	49.24%
High Fossil Fuel Prices	Reference 2024 Build Plan	2.65%	44.31%
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	2.65%	44.31%
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	2.74%	46.08%
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	2.98%	50.81%
Zero Carbon Cost	Reference 2023 Build Plan	2.03%	32.47%
Zero Carbon Cost	Reference 2024 Build Plan	1.773%	27.89%
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	1.773%	27.90%
Zero Carbon Cost	Zero Carbon Cost Build Plan	1.77%	27.76%
Zero Carbon Cost	85% CO_2 Reduction Build Plan	2.31%	37.65%

Under the Reference Market Scenario, the High Fossil Fuels Build Plan results in the lowest compound annual rate of growth in Customer Bills and the 2024 Reference Build Plan is a

close second with a CAGR that is only 0.001 percentage points or 0.04% higher. Under the other two Core Market Scenarios, the 2024 Reference Build Plan or the High Fossil Fuels Build Plan has the lowest CAGR of all Build Plans. The 85% CO_2 Reduction Build Plan produce the highest CAGR under all Core Market Scenarios. The 85% CO_2 Reduction Build Plan results in CAGRs that are between 12% and 30% higher than the 2024 Reference Build Plan and between 6% and 14% higher than the Updated 2023 Reference Build Plan.

[Table begins on following page]

Table 48. Variation in Compound Annual Growth Rate in a Typical Customers' Bill Under the Core Analysis Due to Generation Costs Between the Reference Build Plan and the Other Build Plans.

CAGR and % Variation of the Typical Residential Bill @1000 kWh/month			
Market Scenario	**Build Plan**	**CAGR Variation from the 2023 Reference Build Plan**	**Percentage Variation from the 2023 Reference Build Plan**
Reference	Updated 2023 Reference Build Plan	0.00%	0.00%
Reference	2024 Reference Build Plan	-0.25%	-10.03%
Reference	High Fossil Fuel Prices Build Plan	-0.25%	-10.08%
Reference	Zero Carbon Cost Build Plan	-0.20%	-8.12%
Reference	85% CO_2 Reduction Build Plan	0.15%	6.05%
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	0.00%	0.00%
High Fossil Fuel Prices	2024 Reference Build Plan	-0.25%	-8.50%
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	-0.25%	-8.51%
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	-0.16%	-5.41%
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	0.08%	2.64%
Zero Carbon Cost	Updated 2023 Reference Build Plan	0.00%	0.00%
Zero Carbon Cost	2024 Reference Build Plan	-0.26%	-12.62%
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	-0.26%	-12.60%
Zero Carbon Cost	Zero Carbon Cost Build Plan	-0.26%	-13.00%
Zero Carbon Cost	85% CO_2 Reduction Build Plan	0.28%	13.78%

The corresponding figures for Retail Rates show a similar pattern but lower impact due to how costs are allocated between customer classes based on cost of service data. A principal driver of these allocations is contribution to system peak demand, which varies among customer classes. The 2024 Reference Build Plan, and the High Fossil Fuels Build Plan, have the lowest rate impact under all Market Scenarios.

[Table begins on following page]

Table 49. Compound Annual Growth Rate and Total Change in a Retail Rates Under the Core Analysis Due to Generation Costs

CAGR and % Change in the Retail Rate			
Market Scenario	**Build Plan**	**CAGR**	**Total Change**
Reference	Updated 2023 Reference Build Plan	2.34%	38.31%
Reference	2024 Reference Build Plan	2.12%	34.12%
Reference	High Fossil Fuel Prices Build Plan	2.12%	34.10%
Reference	Zero Carbon Cost Build Plan	2.21%	35.74%
Reference	85% CO_2 Reduction Build Plan	2.39%	39.14%
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	2.83%	47.80%
High Fossil Fuel Prices	2024 Reference Build Plan	2.61%	43.37%
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	2.61%	43.39%
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	2.74%	46.02%
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	2.79%	47.04%
Zero Carbon Cost	Updated 2023 Reference Build Plan	1.79%	28.15%
Zero Carbon Cost	2024 Reference Build Plan	1.56%	24.18%
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	1.56%	24.20%
Zero Carbon Cost	Zero Carbon Cost Build Plan	1.58%	24.58%
Zero Carbon Cost	85% CO_2 Reduction Build Plan	1.98%	31.64%

Retail rate impacts of the Core Build Plans are provided in the table below in dollar terms. The retail rate impacts for the Non-Core Build Plans are provided in **Appendix G**.

Table 50. Retail Rate Impact under Core Build Plans (Reference Market Scenario, dollars/kWh)

	Retail Rate Impact (dollars/kWh)							
Market Scenario	**Optimized Plan**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Reference	Updated 2023 Reference Build Plan	0.1225	0.1276	0.1226	0.1209	0.1207	0.1261	0.1283
Reference	2024 Reference Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1247	0.1274
Reference	High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1247	0.1274
Reference	Zero Carbon Cost Build Plan	0.1225	0.1276	0.1225	0.1204	0.1197	0.1241	0.1267
Reference	85% CO2 Reduction Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1248	0.1265
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	0.1225	0.1276	0.1228	0.1288	0.1291	0.1351	0.1370
High Fossil Fuel Prices	2024 Reference Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1335	0.1358
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1335	0.1359
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	0.1225	0.1276	0.1227	0.1286	0.1286	0.1336	0.1358
High Fossil Fuel Prices	85% CO2 Reduction Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1336	0.1349
Zero Carbon Cost	Updated 2023 Reference Build Plan	0.1225	0.1276	0.1225	0.1194	0.1191	0.1246	0.1269
Zero Carbon Cost	2024 Reference Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1232	0.1260
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1232	0.1260
Zero Carbon Cost	Zero Carbon Cost Build Plan	0.1225	0.1276	0.1224	0.1188	0.1180	0.1225	0.1252
Zero Carbon Cost	85% CO2 Reduction Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1234	0.1252

Market Scenario	**Optimized Plan**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Reference	Updated 2023 Reference Build Plan	0.1341	0.1415	0.1452	0.1495	0.1525	0.1640	0.1657	0.1694
Reference	2024 Reference Build Plan	0.1329	0.1389	0.1423	0.1438	0.1474	0.1567	0.1586	0.1643
Reference	High Fossil Fuel Prices Build Plan	0.1329	0.1389	0.1422	0.1438	0.1473	0.1567	0.1586	0.1643
Reference	Zero Carbon Cost Build Plan	0.1320	0.1388	0.1414	0.1429	0.1464	0.1562	0.1579	0.1663
Reference	85% CO2 Reduction Build Plan	0.1411	0.1474	0.1499	0.1496	0.1586	0.1647	0.1666	0.1704
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	0.1442	0.1523	0.1567	0.1611	0.1640	0.1760	0.1774	0.1810
High Fossil Fuel Prices	2024 Reference Build Plan	0.1427	0.1495	0.1535	0.1553	0.1588	0.1686	0.1703	0.1756
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	0.1427	0.1495	0.1535	0.1553	0.1588	0.1686	0.1703	0.1756
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	0.1426	0.1502	0.1534	0.1551	0.1586	0.1687	0.1705	0.1788
High Fossil Fuel Prices	85% CO2 Reduction Build Plan	0.1501	0.1571	0.1600	0.1604	0.1679	0.1748	0.1765	0.1801
Zero Carbon Cost	Updated 2023 Reference Build Plan	0.1328	0.1402	0.1436	0.1471	0.1493	0.1541	0.1550	0.1570
Zero Carbon Cost	2024 Reference Build Plan	0.1316	0.1376	0.1406	0.1414	0.1441	0.1468	0.1479	0.1521
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	0.1316	0.1376	0.1406	0.1414	0.1442	0.1468	0.1480	0.1521
Zero Carbon Cost	Zero Carbon Cost Build Plan	0.1306	0.1374	0.1396	0.1404	0.1430	0.1456	0.1463	0.1526
Zero Carbon Cost	85% CO2 Reduction Build Plan	0.1399	0.1463	0.1484	0.1474	0.1559	0.1574	0.1589	0.1612

Residential Customer Bill impacts of the Core Build Plans are provided in the table below in dollar terms for a typical residential Rate 8 customer using 1,000 kWh per month. The corresponding bill impacts for the Non-Core Build Plans are provided in **Appendix F**.

[Table begins on following page]

Table 51. Typical Residential Bill under Core Build Plans (Reference Market Scenario, 1000kWh/month)

	Typical Residential Bill @1000 kWh/month							
Market Scenario	**Optimized Plan**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Reference	Updated 2023 Reference Build Plan	146.30	152.34	145.36	143.73	143.45	150.86	153.80
Reference	2024 Reference Build Plan	146.30	152.36	145.72	144.00	143.17	149.15	152.74
Reference	High Fossil Fuel Prices Build Plan	146.30	152.35	145.71	143.98	143.16	149.13	152.72
Reference	Zero Carbon Cost Build Plan	146.30	152.36	145.05	142.67	141.60	147.59	151.08
Reference	85% CO2 Reduction Build Plan	146.30	152.35	145.72	144.00	143.17	149.22	151.44
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	146.30	152.36	145.54	151.65	151.95	159.95	162.46
High Fossil Fuel Prices	2024 Reference Build Plan	146.30	152.36	145.86	151.74	151.46	158.03	161.23
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	146.30	152.36	145.86	151.73	151.44	158.02	161.22
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	146.30	152.36	145.22	150.81	150.53	157.15	160.22
High Fossil Fuel Prices	85% CO2 Reduction Build Plan	146.30	152.35	145.87	151.76	151.46	158.05	159.84
Zero Carbon Cost	Updated 2023 Reference Build Plan	146.30	152.36	145.34	142.21	141.89	149.38	152.43
Zero Carbon Cost	2024 Reference Build Plan	146.30	152.36	145.67	142.49	141.64	147.66	151.35
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	146.30	152.36	145.68	142.50	141.65	147.67	151.36
Zero Carbon Cost	Zero Carbon Cost Build Plan	146.30	152.36	145.01	141.05	139.96	146.01	149.60
Zero Carbon Cost	85% CO2 Reduction Build Plan	146.30	152.35	145.67	142.49	141.64	147.79	150.09

Market Scenario	**Optimized Plan**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Reference	Updated 2023 Reference Build Plan	162.53	172.71	177.39	183.30	186.92	200.51	202.53	206.56
Reference	2024 Reference Build Plan	161.04	169.16	173.35	175.34	179.72	190.19	192.57	199.61
Reference	High Fossil Fuel Prices Build Plan	161.02	169.14	173.33	175.32	179.70	190.16	192.54	199.58
Reference	Zero Carbon Cost Build Plan	159.18	168.45	171.49	173.48	177.81	188.69	190.58	200.92
Reference	85% CO2 Reduction Build Plan	171.93	180.43	183.35	183.42	197.30	204.04	206.55	210.86
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	172.71	183.63	189.01	195.03	198.59	212.61	214.34	218.34
High Fossil Fuel Prices	2024 Reference Build Plan	170.92	179.85	184.75	186.96	191.34	202.22	204.42	211.13
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	170.91	179.83	184.73	186.94	191.32	202.21	204.41	211.12
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	169.87	179.97	183.75	185.88	190.20	201.43	203.30	213.72
High Fossil Fuel Prices	85% CO2 Reduction Build Plan	181.05	190.24	193.66	194.45	206.75	214.26	216.52	220.63
Zero Carbon Cost	Updated 2023 Reference Build Plan	161.27	171.43	175.73	180.87	183.68	190.33	191.58	193.81
Zero Carbon Cost	2024 Reference Build Plan	159.75	167.88	171.67	172.86	176.43	179.93	181.62	187.11
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	159.77	167.90	171.69	172.88	176.45	179.95	181.64	187.12
Zero Carbon Cost	Zero Carbon Cost Build Plan	157.83	167.10	169.74	170.90	174.38	177.81	178.64	186.91
Zero Carbon Cost	85% CO2 Reduction Build Plan	170.76	179.28	181.90	181.18	194.61	196.52	198.55	201.38

XXIII. THE 2024 SHORT-TERM ACTION PLAN

A. Williams and Wateree Replacement Capacity and ELG Compliance

DESC's current generation reserves are sufficient to meet customers' demands under foreseeable conditions, but that calculus changes dramatically with the retirement of Wateree and Williams and the resulting loss to the system of approximately 1,294 MW of base load capacity. DESC remains committed to retiring Wateree in 2028 and Williams in 2030 if that can be done

safely, reliably, and affordably. The following steps will be taken to support the retirement planning for these Units:

1. In the period leading up to the triennial 2026 IRP, DESC will monitor and refine the schedule for regulatory, procurement and construction activities needed to acquire generation, transmission, and fuel resources to replace Williams and Wateree to determine if the planning assumptions regarding the retirements of Wateree in 2028 and Williams in 2030 remain reasonable.
2. DESC will continue to construct the ELG upgrades at Williams to ensure that it can continue to operate beyond 2025.
3. DESC will proceed with preliminary work to support an ELG compliance program at Wateree and will decide to proceed toward compliance or not as early as the second half of 2024.
4. DESC will continue its negotiations and evaluations with Santee Cooper with the goal of establishing a definitive size and configuration for the Joint Resource as well as more definitive information concerning cost and construction schedules for the size and configuration chosen.
5. DESC will continue through its Transmission Planning Department, and in coordination with Santee Cooper, to evaluate the transmission upgrades and estimated costs and schedule, to interconnect the Joint Resource to the transmission grid. This evaluation will include review of the results of the 2023 TIA Report, issued January 9, 2024, potential follow-on TIAs as the size and configuration of the Joint Resource are refined, and an eventual large generator interconnection study when definitive agreements with Santee Cooper are reached.

6. DESC will continue in coordination with Santee Cooper to negotiate with FERC regulated interstate pipeline companies regarding the pipeline expansion projects necessary to deliver natural gas to the Joint Resource with the goal of the interstate pipelines being able to announce open-season solicitation(s) of additional participants in those expansion projects after the requirements of the Joint Resource are fully established.
7. DESC will continue to monitor and evaluate the planned retirement dates for Wateree and Williams based on the outcome of the actions and evaluations listed above, based on the construction schedules for generation, transmission and gas supply assets as they become more accurately defined, based on the modeling of costs and CO_2 emission savings of alternative plans, and based on an assessment of reliability risks. The goal of this monitoring will be to determine a definitive retirement and replacement plan for Wateree and Williams which will be subject to Commission review in Siting Act proceedings for the required assets and updates to DESC's IRPs.
8. When the Joint Resource configuration is decided, DESC will conduct an environmental justice review consistent with relevant laws and regulations, previously developed EPA guidance, and currently accepted best practices. A screening for potential disadvantaged communities near the site of the Joint Resource will be conducted, and the results will be used to inform a community engagement plan that ensures equitable access to information and opportunity for meaningful dialogue.

9. DESC intends to complete the all-sources Urquhart replacement RFP by the end of 2024 to support its ability to issue an RFP for Wateree replacement capacity.
10. The Company will also continue to monitor changes affecting generation cost and needs including natural gas prices, regulatory and legislative requirements regarding CO_2 emissions, the costs of renewable and energy storage technologies, access to fuel supplies and delivery options, governmental incentives, changing environmental policies and the emergence of novel generating technologies.

At the core of this short-term action plan is the Company's intention to monitor changing market conditions and state or federal environmental laws and regulations and update its planning to reflect those changes. DESC will continue to pursue regular and meaningful dialogues with ORS and Stakeholders to receive comments and information, and to work toward achieving as great a level of consensus around these matters as is possible given the sometimes-divergent interests and perspectives of the parties. As always, DESC's guiding commitment is to provide safe, reliable, affordable and increasingly clean energy to its customers.

B. Peaking Modernization Program

In November 2021, the Company entered into a Partial Settlement Agreement in Docket 2021-93-E that allows for the retirement of nine CT units to proceed and for their replacements with three modern units at the Bushy Park and Parr sites. In accordance with the Partial Settlement, the Company is proceeding with the Urquhart RFP, which included a collaborative stakeholder process to design the first-of-its-kind all-sources RFP process.

The specific short-term actions that the Company intends to take in 2024 to accomplish its peaking modernization goals are to:

1. Continue to execute the engineering and construction of the replacement units at Bushy Park and Parr.

2. Conclude the Urquhart RFP activities, specifically to include the evaluation of the bids received and selection of projects to proceed to contracting (as applicable) and transmission interconnection studies.
3. File supplemental testimony in accordance with the Partial Settlement requirement outlining the results of the RFP process and any regulatory treatment or relief to be sought (including affirmation of like-facilities replacement under the Siting Act, if applicable and if a utility self-bid option is selected from the Urquhart RFP process).
4. Proceed to engineering, procurement, and construction of the new units (for a utility self-build) or definitive contracting for third-party resources procured through the Urquhart RFP.

C. The 2023 DSM Potential Study

The specific short-term actions related to the 2023 DSM Potential Study results are to:

1. Prepare and file for Commission review in 2024 the modified DSM 5-Year EE Program Plans in consultation with DSM stakeholders. The program plans are based on the forecasted energy and demand savings found in the 2023 DSM Potential Study, and will include:
   a. Details of marketing efforts.
   b. Customer engagement techniques.
   c. Design of program delivery; and
   d. Incentive/rebate amounts.

D. The AMI Roll-Out and Residential Demand Reduction Programs

The specific short-term actions that the Company intends to take to accomplish its AMI goals are to:

1. Complete installation of AMI meters in 2024.
2. Continue to collect data throughout 2024 to inform the demand response ("DR") assessment of the 2023 DSM Potential Study and finalize the DR programs to be offered to the DESC residential customers.

3. Incorporate the residential demand response programs into the next 5-year DSM/EE program plans to be filed for Commission review in 2024.
4. Continue to timely report the development of the DR programs to stakeholders.

E. Continue the IRP Stakeholder Advisory Group Process

The specific short-term actions that the Company intends to take to accomplish its Stakeholder goals are to:

1. Review the results of the 2024 IRP Update with the advisory group in the second half of 2024.
2. Conduct a minimum of two advisory group meetings in 2024 and 2025 to prepare for the 2025 update and the 2026 triennial plan.

XXIV. CONCLUSION

In this 2024 IRP Update, DESC has updated the modeling done in the 2023 IRP for current inputs and has included additional Build Plans related to emerging issues. The 2024 IRP Update appropriately identifies the 2024 Reference Build Plan as the preferred plan to guide DESC's generation planning at present. It sets out a reasonable and prudent approach of planning for the next steps in the development of DESC's generation portfolio and the retirement of Wateree and Williams at the earliest time consistent with reliability and affordability.

DESC's fundamental objectives remain to protect safety, maintain reliability, and deliver affordable energy to its customers. Achieving these objectives, while providing increasingly clean energy to its customers, will require investment by the Company, support from the Commission, and coordination and consensus-building across all stakeholder groups. DESC submits that this 2024 IRP Update provides a sound and appropriate basis for this investment, regulatory decision making and public engagement.

Appendix A: Glossary of Terms

Table of Abbreviations	
Abbreviation	**Name**
Aero	Aeroderivative Natural Gas-Fired Combustion Turbine Generating Unit
AFR	Accident Frequency Rate
AGP	Advanced Gas Path
AMI	Advance Metering Infrastructure
ATB	Annual Technology Baseline
BSER	Best System of Emission Reduction
CAA	Clean Air Act
CAGR	Compound Annual Growth Rate
CASAC	Chartered Clean Air Scientific Advisory Committee
CC	Combined Cycle Power Plant
CCS	Carbon Capture and Storage
CO_2	Carbon Dioxide
CRA	Charles River Associates
CT	Combustion Turbine
DART	Days Away from Work Rate
DEV	Dominion Energy Virginia
DOE	Department of Energy
DR	Demand Response
DSM	Demand Side Management
EE	Energy Efficiency
EEAG	Energy Efficiency Advisory Group
EIA	Energy Information Administration

Table of Abbreviations	
ELCC	Effective Load Carrying Capacity
ELG	Effluent Limitation Guidelines
EPA	Environmental Protection Agency
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
FOR	Forced Outage Rate
GENCO	South Carolina Generation Company
GWh	Gigawatt Hour
GHG	Greenhouse Gas
GRIP	Grid Resilience and Innovation Partnerships
ICT	Internal Combustion Turbine
IIJA	Infrastructure Investment and Jobs Act
INPO	Institute of Nuclear Power Operations
IRA	Inflation Reduction Act of 2022
ITC	Investment Tax Credits
Ktons	Thousand Tons
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt Hour
LNPV	Levelized Net Present Value
MMBtu	Metric Million British Thermal Unit
Mton	Metric Ton
MW	Megawatt
MW-ac	Megawatt, Alternating Current
MWh	Megawatt Hour

Appendix A: Glossary of Terms

Table of Abbreviations	
NAAQS	National Ambient Air Quality Standards
NERC	North American Electric Reliability Corporation
NGCC	Natural Gas-fired Combined Cycle Unit
NPV	Net Present Value
NRC	Nuclear Regulatory Commission
NREL	National Renewable Energy Laboratory
NSPS	New Source Performance Standards
ORS	South Carolina Office of Regulatory Staff
OSW	Offshore Wind
PA	Policy Assessment
$PM_{2.5}$	Particulate Matter Two- and One-Half Microns or Less in Width
PPA	Power Purchase Agreement
PSD	Prevention of Significant Deterioration
PTC	Production Tax Credit
RFP	Request for Proposal
SAIDI	System Average Interruption Duration Index
SEE	Southeastern Electric Exchange
SERC	Southeastern Reliability Council
SEPA	Southeastern Power Administration
SMR	Small Modular Reactor
STAP	Short-Term Action Plan
TIA	Transmission Impact Analysis
VIP	Voluntary Incentive Program

Appendix B: Report on On-going, Completed, Deferred, and Cancelled Transmission Projects

Transmission Projects			
Planned Project	**Tentative Completion Date**	**Status Update**	**Explanation**
Queensboro – Ft Johnson 115kV Tap	Dec-23	Delayed to Completion Dec-25	Delayed due to outage and constructability constraints
Whiskey Road 115kV-12kV Substation and 115kV Line: Construct	Aug-23	In Service Nov-23	
Emory 230-23kV Distribution Sub: Construct	Dec-23	Delayed to Completion July-24	Delayed due to material delivery delays
Queensboro – Johns Island 115kV Tie and Church Creek – Queensboro 115kV: Rebuild Stono River and Marsh Crossings	Dec-22	In Service Dec-23	Delayed due to construction schedule
Church Creek – Queensboro 115kV Phase 1: Construct	Dec-23	In Service Aug-23	
Wateree – Hopkins 230kV Line #2: Rebuild	Dec-23	In Service Nov-23	
Okatie – Bluffton 115kV: Rebuild	Dec-24	Delayed to Completion June-25	Delayed due to permitting delays
Denny Terrace Substation: Replace Switch House	Dec-23	In Service Dec-23	
Eastover – Square D 115kV: Rebuild	Dec-23	Delayed to Completion June-24	Delayed due to outage constraints
Hopkins – Square D 115kV: Rebuild	Dec-24	Accelerated to Completion Sept-24	Schedule improvement due to shifting of resources
Burton – St Helena 115kV: Rebuild Burton – Frogmore Transmission Section	Dec-24	On Schedule	
Burton – St Helena 115kV: Frogmore Distribution – St Helena	Dec-25	On Schedule	
Jasper – Okatie 230kV #2, Okatie – Riverport 230kV: Construct	Dec-24	Delayed to Completion Dec-25	Delayed due to permitting delays

Appendix B: Report on On-going, Completed, Deferred, and Cancelled Transmission Projects

Transmission Projects			
Planned Project	**Tentative Completion Date**	**Status Update**	**Explanation**
VCS1 – Denny Terrace 230kV: Rebuild Single Circuit Section	Dec-26	On Schedule	
VCS1 – Pineland 230kV: Rebuild Single Circuit Section	Dec-26	On Schedule	
Wateree – Hopkins 230kV Line #1: Rebuild	Dec-26	Delayed to Completion Dec-29	Delayed due to budget constraints
Coit – Gills Creek 115kV Line: Construct	Dec-24	On Schedule	
Union Pier 115–13.8kV Sub: Tap Construct	Dec-25	Delayed to Completion Dec-27	Delayed due to developer
Cainhoy – Hamlin 115kV: Rebuild Line and Cainhoy – Hamlin 115kV #2: Construct New 115kV Line	Dec-24	Delayed Completion to Dec-25	Delayed due to permitting delays
Hopkins – CIP 230kV: Rebuild	Dec-25	On Schedule	
Faber Place – Bayfront 115kV: Rebuild North Bridge Terrace to Bayfront Section	Dec-25	Delayed Completion to Dec-28	Delayed due to R/W and constructability challenges
Wateree – Killian 230kV: Rebuild	Dec-28	On Schedule	
Canadys – Ritter 115kV: Rebuild as 230/115kV Double Circuit	Jun-26	On Schedule	
Ritter – Yemassee 230kV and 115kV Transmission System Expansion	Jun-26	On Schedule	
Okatie 230–115kV Sub and the Jasper – Yemassee Fold In	Dec-24	On Schedule	
Clements Ferry 115–23kV Sub: Construct; Jack Primus–Cainhoy 115kV with Clements Ferry Tap Construct	Dec-27	On Schedule	
Cope Distribution 115-23kV Substation and 115kV Transmission Line Tap Construction	Mar-23	In Service Mar-23	

Appendix B: Report on On-going, Completed, Deferred, and Cancelled Transmission Projects

Transmission Projects			
Planned Project	**Tentative Completion Date**	**Status Update**	**Explanation**
Ridgeville Commerce Park 115-23kV Substation and 115kV Line	Dec-25	On Schedule	
Coosawhatchie 115-23kV Substation and 115kV Line	Jul-24	On Schedule	
Bushy Park 115kV Substation for New Turbine	Mar-24	On Schedule	

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Update 2023 Reference Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	150	0	0	0	0
2027	4937	6334	28.3	0	225	0	0	0	0
2028	5041	6351	26.0	0	300	0	0	0	0
2029	5116	6229	21.8	201	300	400	0	0	-684
2030	5178	6253	20.8	0	300	0	0	0	0
2031	5249	6328	20.6	662	300	0	0	0	-610
2032	5310	6398	20.5	52	300	0	0	0	0
2033	5351	6496	21.4	0	300	100	0	0	0
2034	5390	6760	25.4	0	300	300	0	0	0
2035	5435	6767	24.5	0	300	0	0	0	0
2036	5477	6923	26.4	0	300	300	0	0	0
2037	5524	6925	25.4	0	150	0	0	0	0
2038	5576	6792	21.8	0	150	0	0	0	0
2039	5634	6894	22.4	0	150	200	0	0	0
2040	5692	7418	30.3	523	150	0	0	0	0
2041	5755	7421	29.0	0	150	0	0	0	0
2042	5818	7423	27.6	0	150	0	0	0	0
2043	5877	7424	26.3	0	150	0	0	0	0
2044	5941	7487	26.0	402	150	0	0	0	0
2045	6006	7489	24.7	0	150	0	0	0	0
2046	6071	7492	23.4	0	150	0	0	0	0
2047	6137	7543	22.9	0	150	100	0	0	0
2048	6204	7556	21.8	0	150	200	0	0	0
2049	6271	7823	24.8	523	150	0	0	0	0
2050	6339	7819	23.3	0	0	0	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

2024 Reference Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6176	20.7	402	300	100	0	0	-684
2030	5178	6285	21.4	0	300	100	0	0	0
2031	5249	6360	21.2	662	300	0	0	0	-610
2032	5310	6378	20.1	0	300	100	0	0	0
2033	5351	6476	21.0	0	300	0	0	0	0
2034	5390	6486	20.3	0	300	0	0	0	0
2035	5435	6577	21.0	0	300	100	0	0	0
2036	5477	6668	21.7	0	300	100	0	0	0
2037	5524	6671	20.8	0	300	0	0	0	0
2038	5576	6709	20.3	0	300	0	0	0	0
2039	5634	6796	20.6	0	300	0	0	0	0
2040	5692	6854	20.4	0	300	0	0	0	0
2041	5755	6912	20.1	0	300	0	0	0	0
2042	5818	7025	20.7	0	300	100	0	0	0
2043	5877	7080	20.5	0	0	100	0	0	0
2044	5941	7136	20.1	0	0	200	0	0	0
2045	6006	7484	24.6	402	0	200	0	0	0
2046	6071	7486	23.3	0	0	100	0	0	0
2047	6137	7486	22.0	0	0	300	0	0	0
2048	6204	7483	20.6	0	0	100	0	0	0
2049	6271	7537	20.2	0	0	200	0	0	0
2050	6339	7642	20.6	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

High Fossil Fuel Prices Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6176	20.7	402	300	100	0	0	-684
2030	5178	6285	21.4	0	300	100	0	0	0
2031	5249	6360	21.2	662	300	0	0	0	-610
2032	5310	6378	20.1	0	300	100	0	0	0
2033	5351	6476	21.0	0	300	0	0	0	0
2034	5390	6486	20.3	0	300	0	0	0	0
2035	5435	6577	21.0	0	300	100	0	0	0
2036	5477	6668	21.7	0	300	100	0	0	0
2037	5524	6671	20.8	0	300	0	0	0	0
2038	5576	6709	20.3	0	300	0	0	0	0
2039	5634	6796	20.6	0	300	0	0	0	0
2040	5692	6854	20.4	0	300	0	0	0	0
2041	5755	6912	20.1	0	300	0	0	0	0
2042	5818	7025	20.7	0	300	100	0	0	0
2043	5877	7081	20.5	0	300	100	0	0	0
2044	5941	7138	20.2	0	225	200	0	0	0
2045	6006	7486	24.6	402	0	200	0	0	0
2046	6071	7488	23.3	0	0	100	0	0	0
2047	6137	7489	22.0	0	0	300	0	0	0
2048	6204	7485	20.7	0	0	100	0	0	0
2049	6271	7539	20.2	0	0	200	0	0	0
2050	6339	7645	20.6	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Zero Carbon Cost Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6306	29.5	0	0	0	0	0	0
2027	4937	6332	28.3	0	0	0	0	0	0
2028	5041	6348	25.9	0	225	0	0	0	0
2029	5116	6173	20.7	402	300	100	0	0	-684
2030	5178	6282	21.3	0	300	100	0	0	0
2031	5249	6357	21.1	662	300	0	0	0	-610
2032	5310	6460	21.7	0	300	100	0	0	0
2033	5351	6473	21.0	0	300	0	0	0	0
2034	5390	6482	20.3	0	300	0	0	0	0
2035	5435	6574	21.0	0	300	100	0	0	0
2036	5477	6664	21.7	0	300	100	0	0	0
2037	5524	6666	20.7	0	0	0	0	0	0
2038	5576	6934	24.4	402	0	0	0	0	0
2039	5634	6935	23.1	0	0	0	0	0	0
2040	5692	6936	21.9	0	0	0	0	0	0
2041	5755	6938	20.6	0	0	0	0	0	0
2042	5818	7024	20.7	0	0	100	0	0	0
2043	5877	7109	21.0	0	0	100	0	0	0
2044	5941	7195	21.1	0	0	200	0	0	0
2045	6006	7251	20.7	0	0	200	0	0	0
2046	6071	7308	20.4	0	0	100	0	0	0
2047	6137	7419	20.9	0	0	300	0	0	0
2048	6204	7470	20.4	0	0	100	0	0	0
2049	6271	7579	20.9	0	0	200	0	0	0
2050	6339	7630	20.4	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

85% CO_2 Reduction Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6199	21.2	0	300	600	0	0	-684
2030	5178	6223	20.2	0	300	0	0	0	0
2031	5249	6961	32.6	1325	300	0	0	0	-610
2032	5310	6979	31.4	0	300	0	0	0	0
2033	5351	6992	30.7	0	300	0	0	0	0
2034	5390	7002	29.9	0	300	0	0	0	0
2035	5435	7328	34.8	0	300	0	800	0	0
2036	5477	7334	33.9	0	300	0	0	0	0
2037	5524	7337	32.8	0	300	0	0	0	0
2038	5576	7205	29.2	0	300	0	0	0	0
2039	5634	7207	27.9	0	300	0	0	0	0
2040	5692	7484	31.5	0	300	0	0	274	0
2041	5755	7487	30.1	0	300	0	0	0	0
2042	5818	7490	28.7	0	300	0	0	0	0
2043	5877	7491	27.5	0	300	0	0	0	0
2044	5941	7154	20.4	0	300	200	0	0	0
2045	6006	7430	23.7	0	300	0	0	274	0
2046	6071	7604	25.2	0	300	200	0	0	0
2047	6137	7776	26.7	0	300	200	0	0	0
2048	6204	7859	26.7	0	300	100	0	0	0
2049	6271	7944	26.7	0	300	100	0	0	0
2050	6339	8270	30.5	0	300	100	0	274	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Electrification Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4878	6306	29.3	0	0	0	0	0	0
2027	4973	6332	27.3	0	0	0	0	0	0
2028	5071	6347	25.2	0	0	0	0	0	0
2029	5170	6257	21.0	402	300	200	0	0	-684
2030	5271	6366	20.8	0	300	100	0	0	0
2031	5374	7103	32.2	1325	300	0	0	0	-610
2032	5479	7121	30.0	0	300	0	0	0	0
2033	5557	7135	28.4	0	300	0	0	0	0
2034	5637	7144	26.7	0	300	0	0	0	0
2035	5717	7151	25.1	0	300	0	0	0	0
2036	5799	7156	23.4	0	300	0	0	0	0
2037	5881	7158	21.7	0	0	0	0	0	0
2038	5965	7194	20.6	0	0	200	0	0	0
2039	6050	7280	20.3	0	0	100	0	0	0
2040	6137	7683	25.2	402	0	0	0	0	0
2041	6224	7685	23.5	0	0	0	0	0	0
2042	6313	7686	21.7	0	0	0	0	0	0
2043	6403	7771	21.4	0	0	100	0	0	0
2044	6496	8004	23.2	402	0	0	0	0	0
2045	6591	7920	20.2	0	0	0	0	0	0
2046	6687	8092	21.0	0	0	200	0	0	0
2047	6785	8178	20.5	0	0	100	0	0	0
2048	6884	8314	20.8	0	0	200	0	0	0
2049	6985	8423	20.6	0	0	200	0	0	0
2050	7087	8528	20.3	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Energy Conservation Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4830	6307	30.6	0	300	0	0	0	0
2027	4876	6335	29.9	0	300	0	0	0	0
2028	4923	6352	29.0	0	300	0	0	0	0
2029	4970	6029	21.3	0	300	400	0	0	-684
2030	5018	6053	20.6	0	300	0	0	0	0
2031	5065	6128	21.0	662	300	0	0	0	-610
2032	5114	6146	20.2	0	300	0	0	0	0
2033	5136	6244	21.6	0	300	100	0	0	0
2034	5158	6254	21.2	0	300	0	0	0	0
2035	5180	6260	20.9	0	300	0	0	0	0
2036	5202	6351	22.1	0	300	100	0	0	0
2037	5224	6354	21.6	0	300	0	0	0	0
2038	5246	6307	20.2	0	300	100	0	0	0
2039	5269	6394	21.4	0	300	100	0	0	0
2040	5291	6397	20.9	0	300	0	0	0	0
2041	5314	6400	20.4	0	300	0	0	0	0
2042	5336	6458	21.0	0	300	100	0	0	0
2043	5359	6458	20.5	0	0	0	0	0	0
2044	5382	6514	21.0	0	0	500	0	0	0
2045	5405	6515	20.5	0	0	0	0	0	0
2046	5428	6572	21.1	0	0	100	0	0	0
2047	5451	6572	20.6	0	0	0	0	0	0
2048	5474	6624	21.0	0	0	200	0	0	0
2049	5497	6678	21.5	0	0	100	0	0	0
2050	5520	6673	20.9	0	0	0	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Aggressive Regulation Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4878	6307	29.3	0	300	0	0	0	0
2027	4973	6335	27.4	0	300	0	0	0	0
2028	5071	6352	25.3	0	300	0	0	0	0
2029	5170	6261	21.1	402	300	200	0	0	-684
2030	5271	6370	20.9	0	300	100	0	0	0
2031	5374	7108	32.3	1325	300	0	0	0	-610
2032	5479	7126	30.1	0	300	0	0	0	0
2033	5557	7139	28.5	0	300	0	0	0	0
2034	5637	7149	26.8	0	300	0	0	0	0
2035	5717	7155	25.2	0	300	0	0	0	0
2036	5799	7161	23.5	0	300	0	0	0	0
2037	5881	7164	21.8	0	300	0	0	0	0
2038	5965	7202	20.7	0	300	200	0	0	0
2039	6050	7289	20.5	0	300	100	0	0	0
2040	6137	7377	20.2	0	300	100	0	0	0
2041	6224	7520	20.8	0	300	200	0	0	0
2042	6313	7633	20.9	0	300	200	0	0	0
2043	6403	7744	20.9	0	300	200	0	0	0
2044	6496	8039	23.7	402	300	0	0	0	0
2045	6591	7986	21.2	0	300	0	0	0	0
2046	6687	8043	20.3	0	0	100	0	0	0
2047	6785	8154	20.2	0	0	200	0	0	0
2048	6884	8552	24.2	402	0	0	0	0	0
2049	6985	8551	22.4	0	0	0	0	0	0
2050	7087	8546	20.6	0	0	0	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

High DSM Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4735	6174	30.4	0	0	0	0	0	0
2025	4777	6300	31.9	0	0	0	0	0	0
2026	4856	6307	29.9	0	300	0	0	0	0
2027	4920	6335	28.8	0	300	0	0	0	0
2028	5021	6352	26.5	0	300	0	0	0	0
2029	5091	6176	21.3	402	300	100	0	0	-684
2030	5150	6200	20.4	0	300	0	0	0	0
2031	5218	6275	20.3	662	300	0	0	0	-610
2032	5275	6378	20.9	0	300	100	0	0	0
2033	5312	6391	20.3	0	300	0	0	0	0
2034	5347	6486	21.3	0	300	100	0	0	0
2035	5389	6492	20.5	0	300	0	0	0	0
2036	5427	6583	21.3	0	300	100	0	0	0
2037	5468	6586	20.5	0	300	0	0	0	0
2038	5521	6709	21.5	0	300	300	0	0	0
2039	5578	6711	20.3	0	300	0	0	0	0
2040	5637	6799	20.6	0	300	100	0	0	0
2041	5700	6857	20.3	0	300	100	0	0	0
2042	5762	6969	20.9	0	150	200	0	0	0
2043	5822	7024	20.6	0	0	100	0	0	0
2044	5885	7372	25.3	402	0	0	0	0	0
2045	5949	7373	23.9	0	0	0	0	0	0
2046	6014	7375	22.6	0	0	0	0	0	0
2047	6079	7321	20.4	0	0	0	0	0	0
2048	6145	7427	20.9	0	0	200	0	0	0
2049	6212	7481	20.4	0	0	200	0	0	0
2050	6280	7586	20.8	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Low DSM Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4742	6174	30.2	0	0	0	0	0	0
2025	4790	6300	31.5	0	0	0	0	0	0
2026	4875	6307	29.4	0	300	0	0	0	0
2027	4946	6335	28.1	0	300	0	0	0	0
2028	5053	6352	25.7	0	300	0	0	0	0
2029	5129	6176	20.4	402	300	100	0	0	-684
2030	5193	6285	21.0	0	300	100	0	0	0
2031	5267	6360	20.8	662	300	0	0	0	-610
2032	5329	6463	21.3	0	300	100	0	0	0
2033	5374	6476	20.5	0	300	0	0	0	0
2034	5414	6571	21.4	0	300	100	0	0	0
2035	5462	6577	20.4	0	300	0	0	0	0
2036	5507	6668	21.1	0	300	100	0	0	0
2037	5554	6671	20.1	0	300	0	0	0	0
2038	5606	6794	21.2	0	300	300	0	0	0
2039	5665	6851	20.9	0	300	100	0	0	0
2040	5723	6909	20.7	0	300	100	0	0	0
2041	5787	6967	20.4	0	300	100	0	0	0
2042	5849	7080	21.0	0	300	200	0	0	0
2043	5908	7135	20.8	0	0	100	0	0	0
2044	5972	7483	25.3	402	0	0	0	0	0
2045	6037	7429	23.1	0	0	0	0	0	0
2046	6102	7431	21.8	0	0	0	0	0	0
2047	6168	7431	20.5	0	0	100	0	0	0
2048	6235	7538	20.9	0	0	200	0	0	0
2049	6303	7592	20.4	0	0	200	0	0	0
2050	6371	7662	20.3	0	0	200	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Proposed GHG Rule Build Plan									
Year	**Peak (MW)**	**Firm Capacity (MW)**	**Winter Reserve Margin (%)**	**New Gas (MW)**	**New Solar (MW)**	**New Storage (MW)**	**New Wind (MW)**	**New SMR (MW)**	**Retirements (MW)**
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6373	24.6	0	300	0	0	0	0
2030	5178	6397	23.5	0	300	0	0	0	0
2031	5249	6420	22.3	0	300	0	0	0	0
2032	5310	6411	20.7	402	300	300	0	0	-684
2033	5351	6509	21.6	0	300	100	0	0	0
2034	5390	6519	20.9	0	300	0	0	0	0
2035	5435	6897	26.9	662	300	0	800	0	-610
2036	5477	6903	26.0	0	300	0	0	0	0
2037	5524	6906	25.0	0	300	0	0	0	0
2038	5576	6774	21.5	0	300	0	0	0	0
2039	5634	6776	20.3	0	300	0	0	0	0
2040	5692	6864	20.6	0	300	100	0	0	0
2041	5755	6952	20.8	0	300	100	0	0	0
2042	5818	7040	21.0	0	300	100	0	0	0
2043	5877	7126	21.3	0	300	100	0	0	0
2044	5941	7184	20.9	0	300	100	0	0	0
2045	6006	7241	20.6	0	300	100	0	0	0
2046	6071	7300	20.2	0	300	100	0	0	0
2047	6137	7649	24.6	402	300	200	0	0	0
2048	6204	7592	22.4	0	300	0	0	0	0
2049	6271	7647	21.9	0	300	100	0	0	0
2050	6339	7644	20.6	0	300	0	0	0	0

Appendix C: Timing and Nature of Resource Additions and Resulting Capacities and Reserve Margins

Retirements - 2032/2034 Build Plan									
Year	Peak (MW)	Firm Capacity (MW)	Winter Reserve Margin (%)	New Gas (MW)	New Solar (MW)	New Storage (MW)	New Wind (MW)	New SMR (MW)	Retirements (MW)
2024	4739	6174	30.3	0	0	0	0	0	0
2025	4785	6300	31.7	0	0	0	0	0	0
2026	4869	6307	29.5	0	300	0	0	0	0
2027	4937	6335	28.3	0	300	0	0	0	0
2028	5041	6352	26.0	0	300	0	0	0	0
2029	5116	6373	24.6	0	300	0	0	0	0
2030	5178	6397	23.5	0	300	0	0	0	0
2031	5249	6420	22.3	0	300	0	0	0	0
2032	5310	6438	21.2	0	300	0	0	0	0
2033	5351	6429	20.2	662	300	0	0	0	-684
2034	5390	6524	21.0	0	300	100	0	0	0
2035	5435	6724	23.7	804	300	0	0	0	-610
2036	5477	6730	22.9	0	300	0	0	0	0
2037	5524	6733	21.9	0	300	0	0	0	0
2038	5576	6771	21.4	0	300	200	0	0	0
2039	5634	6773	20.2	0	300	0	0	0	0
2040	5692	6861	20.5	0	300	100	0	0	0
2041	5755	6949	20.7	0	300	100	0	0	0
2042	5818	7035	20.9	0	0	100	0	0	0
2043	5877	7120	21.2	0	0	100	0	0	0
2044	5941	7206	21.3	0	0	100	0	0	0
2045	6006	7262	20.9	0	0	100	0	0	0
2046	6071	7319	20.6	0	0	100	0	0	0
2047	6137	7375	20.2	0	0	100	0	0	0
2048	6204	7481	20.6	0	0	200	0	0	0
2049	6271	7535	20.2	0	0	200	0	0	0
2050	6339	7640	20.5	0	0	200	0	0	0

Appendix D: Generation Added by Type for each Resource Plan by Year

Updated 2023 Reference Build Plan														
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	CT Frame 2x	SMR	Solar	Solar IRA	Solar PPA	Solar PPA IRA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-	150	-	-
2027	-	-	-	-	-	-	-	-	-	75	-	150	-	-
2028	-	-	-	-	-	-	-	-	-	150	-	150	-	-
2029	-	-	-	-	201	-	-	-	-	150	-	150	-	400
2030	-	-	-	-	-	-	-	-	-	150	-	150	-	-
2031	662	-	-	-	-	-	-	-	-	150	-	150	-	-
2032	-	-	52	-	-	-	-	-	-	150	-	150	-	-
2033	-	-	-	-	-	-	-	-	-	150	-	150	-	100
2034	-	-	-	-	-	-	-	-	-	150	-	150	-	300
2035	-	-	-	-	-	-	-	-	-	150	-	150	-	-
2036	-	-	-	-	-	-	-	-	150	-	150	-	-	300
2037	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	150	-	-	200
2040	-	-	-	-	-	-	523	-	-	-	150	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2044	-	-	-	-	-	402	-	-	-	-	150	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	150	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	150	-	-	100
2048	-	-	-	-	-	-	-	-	-	-	150	-	-	200
2049	-	-	-	-	-	-	523	-	-	-	150	-	-	-
2050	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total MW	662	-	52	-	201	402	1,046	-	150	1,275	2,100	1,500	-	1,600

Appendix D: Generation Added by Type for each Resource Plan by Year

2024 Reference Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	402	-	-	300	-	100
2030	-	-	-	-	-	-	-	-	300	-	100
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	100
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	100
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	-
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	-	-	300	-	-
2041	-	-	-	-	-	-	-	-	300	-	-
2042	-	-	-	-	-	-	-	-	300	-	100
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	-	-	-	-	-	200
2045	-	-	-	-	-	402	-	-	-	-	200
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	300
2048	-	-	-	-	-	-	-	-	-	-	100
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	5,100	-	2,000

Appendix D: Generation Added by Type for each Resource Plan by Year

High Fossil Prices Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	402	-	-	300	-	100
2030	-	-	-	-	-	-	-	-	300	-	100
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	100
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	100
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	-
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	-	-	300	-	-
2041	-	-	-	-	-	-	-	-	300	-	-
2042	-	-	-	-	-	-	-	-	300	-	100
2043	-	-	-	-	-	-	-	-	300	-	100
2044	-	-	-	-	-	-	-	-	225	-	200
2045	-	-	-	-	-	402	-	-	-	-	200
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	300
2048	-	-	-	-	-	-	-	-	-	-	100
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	5,625	-	2,000

Appendix D: Generation Added by Type for each Resource Plan by Year

Zero Carbon Cost Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	225	-	-
2029	-	-	-	-	-	402	-	-	300	-	100
2030	-	-	-	-	-	-	-	-	300	-	100
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	100
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	100
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	402	-	-	-	-	-
2039	-	-	-	-	-	-	-	-	-	-	-
2040	-	-	-	-	-	-	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	100
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	-	-	-	-	-	200
2045	-	-	-	-	-	-	-	-	-	-	200
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	300
2048	-	-	-	-	-	-	-	-	-	-	100
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	2,625	-	2,000

Appendix D: Generation Added by Type for each Resource Plan by Year

85% CO_2 Reduction Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero H2 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	-	-	-	300	-	600
2030	-	-	-	-	-	-	-	-	300	-	-
2031	-	1,325	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	-
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	800	-
2036	-	-	-	-	-	-	-	-	300	-	-
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	-
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	274	-	300	-	-
2041	-	-	-	-	-	-	-	-	300	-	-
2042	-	-	-	-	-	-	-	-	300	-	-
2043	-	-	-	-	-	-	-	-	300	-	-
2044	-	-	-	-	-	-	-	-	300	-	200
2045	-	-	-	-	-	-	274	-	300	-	-
2046	-	-	-	-	-	-	-	-	300	-	200
2047	-	-	-	-	-	-	-	-	300	-	200
2048	-	-	-	-	-	-	-	-	300	-	100
2049	-	-	-	-	-	-	-	-	300	-	100
2050	-	-	-	-	-	-	274	-	300	-	100
Total MW	-	1,325	-	-	-	-	822	-	7,500	800	1,500

Appendix D: Generation Added by Type for each Resource Plan by Year

Electrification Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-
2027	-	-	-	-	-	-	-	-	-	-	-
2028	-	-	-	-	-	-	-	-	-	-	-
2029	-	-	-	-	-	402	-	-	300	-	200
2030	-	-	-	-	-	-	-	-	300	-	100
2031	-	1,325	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	-
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	-
2037	-	-	-	-	-	-	-	-	-	-	-
2038	-	-	-	-	-	-	-	-	-	-	200
2039	-	-	-	-	-	-	-	-	-	-	100
2040	-	-	-	-	-	402	-	-	-	-	-
2041	-	-	-	-	-	-	-	-	-	-	-
2042	-	-	-	-	-	-	-	-	-	-	-
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	402	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	200
2047	-	-	-	-	-	-	-	-	-	-	100
2048	-	-	-	-	-	-	-	-	-	-	200
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	-	1,325	-	-	-	1,206	-	-	2,400	-	1,600

Appendix D: Generation Added by Type for each Resource Plan by Year

Energy Conservation Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore WInd	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	-	-	-	300	-	400
2030	-	-	-	-	-	-	-	-	300	-	-
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	-
2033	-	-	-	-	-	-	-	-	300	-	100
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	100
2039	-	-	-	-	-	-	-	-	300	-	100
2040	-	-	-	-	-	-	-	-	300	-	-
2041	-	-	-	-	-	-	-	-	300	-	-
2042	-	-	-	-	-	-	-	-	300	-	100
2043	-	-	-	-	-	-	-	-	-	-	-
2044	-	-	-	-	-	-	-	-	-	-	500
2045	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	200
2049	-	-	-	-	-	-	-	-	-	-	100
2050	-	-	-	-	-	-	-	-	-	-	-
Total MW	662	-	-	-	-	-	-	-	5,100	-	1,800

Appendix D: Generation Added by Type for each Resource Plan by Year

Aggressive Regulation Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore WInd	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	402	-	-	300	-	200
2030	-	-	-	-	-	-	-	-	300	-	100
2031	-	1,325	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	-
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	-
2035	-	-	-	-	-	-	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	-
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	200
2039	-	-	-	-	-	-	-	-	300	-	100
2040	-	-	-	-	-	-	-	-	300	-	100
2041	-	-	-	-	-	-	-	-	300	-	200
2042	-	-	-	-	-	-	-	-	300	-	200
2043	-	-	-	-	-	-	-	-	300	-	200
2044	-	-	-	-	-	402	-	-	300	-	-
2045	-	-	-	-	-	-	-	-	300	-	-
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	200
2048	-	-	-	-	-	402	-	-	-	-	-
2049	-	-	-	-	-	-	-	-	-	-	-
2050	-	-	-	-	-	-	-	-	-	-	-
Total MW	-	1,325	-	-	-	1,206	-	-	6,000	-	1,600

Appendix D: Generation Added by Type for each Resource Plan by Year

High DSM Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore WInd	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	402	-	-	300	-	100
2030	-	-	-	-	-	-	-	-	300	-	-
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	100
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	100
2035	-	-	-	-	-	-	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	300
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	-	-	300	-	100
2041	-	-	-	-	-	-	-	-	300	-	100
2042	-	-	-	-	-	-	-	-	150	-	200
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	402	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	-
2048	-	-	-	-	-	-	-	-	-	-	200
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	4,950	-	1,800

Appendix D: Generation Added by Type for each Resource Plan by Year

Low DSM Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	402	-	-	300	-	100
2030	-	-	-	-	-	-	-	-	300	-	100
2031	662	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	100
2033	-	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	100
2035	-	-	-	-	-	-	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	100
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	300
2039	-	-	-	-	-	-	-	-	300	-	100
2040	-	-	-	-	-	-	-	-	300	-	100
2041	-	-	-	-	-	-	-	-	300	-	100
2042	-	-	-	-	-	-	-	-	300	-	200
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	402	-	-	-	-	-
2045	-	-	-	-	-	-	-	-	-	-	-
2046	-	-	-	-	-	-	-	-	-	-	-
2047	-	-	-	-	-	-	-	-	-	-	100
2048	-	-	-	-	-	-	-	-	-	-	200
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	5,100	-	2,100

Appendix D: Generation Added by Type for each Resource Plan by Year

Proposed GHG Rule Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	-	-	-	300	-	-
2030	-	-	-	-	-	-	-	-	300	-	-
2031	-	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	402	-	-	300	-	300
2033	-	-	-	-	-	-	-	-	300	-	100
2034	-	-	-	-	-	-	-	-	300	-	-
2035	662	-	-	-	-	-	-	-	300	800	-
2036	-	-	-	-	-	-	-	-	300	-	-
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	-
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	-	-	300	-	100
2041	-	-	-	-	-	-	-	-	300	-	100
2042	-	-	-	-	-	-	-	-	300	-	100
2043	-	-	-	-	-	-	-	-	300	-	100
2044	-	-	-	-	-	-	-	-	300	-	100
2045	-	-	-	-	-	-	-	-	300	-	100
2046	-	-	-	-	-	-	-	-	300	-	100
2047	-	-	-	-	-	402	-	-	300	-	200
2048	-	-	-	-	-	-	-	-	300	-	-
2049	-	-	-	-	-	-	-	-	300	-	100
2050	-	-	-	-	-	-	-	-	300	-	-
Total MW	662	-	-	-	-	804	-	-	7,500	800	1,400

Appendix D: Generation Added by Type for each Resource Plan by Year

Retirements - 2032/2034 Build Plan											
Year	2x1 CC 50% Shared	2x1 CC	CT Aero 1x	CT Aero 2x	CT Frame 1x	CT Frame 2x	SMR	Solar	Solar PPA	Off Shore Wind	Battery
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	300	-	-
2027	-	-	-	-	-	-	-	-	300	-	-
2028	-	-	-	-	-	-	-	-	300	-	-
2029	-	-	-	-	-	-	-	-	300	-	-
2030	-	-	-	-	-	-	-	-	300	-	-
2031	-	-	-	-	-	-	-	-	300	-	-
2032	-	-	-	-	-	-	-	-	300	-	-
2033	662	-	-	-	-	-	-	-	300	-	-
2034	-	-	-	-	-	-	-	-	300	-	100
2035	-	-	-	-	-	804	-	-	300	-	-
2036	-	-	-	-	-	-	-	-	300	-	-
2037	-	-	-	-	-	-	-	-	300	-	-
2038	-	-	-	-	-	-	-	-	300	-	200
2039	-	-	-	-	-	-	-	-	300	-	-
2040	-	-	-	-	-	-	-	-	300	-	100
2041	-	-	-	-	-	-	-	-	300	-	100
2042	-	-	-	-	-	-	-	-	-	-	100
2043	-	-	-	-	-	-	-	-	-	-	100
2044	-	-	-	-	-	-	-	-	-	-	100
2045	-	-	-	-	-	-	-	-	-	-	100
2046	-	-	-	-	-	-	-	-	-	-	100
2047	-	-	-	-	-	-	-	-	-	-	100
2048	-	-	-	-	-	-	-	-	-	-	200
2049	-	-	-	-	-	-	-	-	-	-	200
2050	-	-	-	-	-	-	-	-	-	-	200
Total MW	662	-	-	-	-	804	-	-	4,800	-	1,700

Appendix E: Energy from Renewable Generation Summed by Five-year Period for the Twenty-Four Cases

Market Scenario	Build Plan	2024 - 2028	2029 - 2033	2034 - 2038	2039 - 2043	2044 - 2048	2049 - 2050	Total
Reference	Updated 2023 Reference Build Plan	11,374	10,869	11,755	18,421	25,428	10,904	88,751
Reference	2024 Reference Build Plan	15,401	30,545	43,838	55,036	59,148	23,345	227,313
Reference	High Fossil Fuel Prices Build Plan	15,401	30,542	43,836	55,347	61,950	24,756	231,832
Reference	Zero Carbon Cost Build Plan	11,879	23,432	36,769	38,071	37,384	13,607	161,141
Reference	85% CO_2 Reduction Build Plan	15,398	30,888	54,865	65,843	70,905	31,320	269,220
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	11,374	10,869	11,754	18,415	25,397	10,888	88,698
High Fossil Fuel Prices	2024 Reference Build Plan	15,385	30,492	43,750	55,043	59,150	23,349	227,170
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	15,387	30,489	43,755	55,350	61,967	24,759	231,707
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	11,879	23,428	36,731	38,074	37,384	13,607	161,104
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	15,387	30,888	54,880	65,841	70,886	31,308	269,190
Zero Carbon Cost	Updated 2023 Reference Build Plan	11,374	10,869	11,757	18,416	25,403	10,874	88,693
Zero Carbon Cost	2024 Reference Build Plan	15,400	30,546	43,797	54,956	59,094	23,331	227,125
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	15,400	30,545	43,800	55,264	61,874	24,734	231,615
Zero Carbon Cost	Zero Carbon Cost Build Plan	11,879	23,435	36,743	38,043	37,382	13,607	161,089
Zero Carbon Cost	85% CO_2 Reduction Build Plan	15,400	30,889	54,818	65,810	71,023	31,328	269,269
Sensitivity	Electrification Build Plan	11,374	20,944	34,597	35,952	34,875	12,600	150,342
Sensitivity	Energy Conservation Build Plan	15,386	30,638	43,381	51,984	55,344	22,185	218,918
Sensitivity	Aggressive Regulation Build Plan	15,388	30,721	44,139	56,756	65,569	26,477	239,049
Sensitivity	High DSM Build Plan	15,401	30,408	43,456	54,052	57,227	22,756	223,300
Sensitivity	Low DSM Build Plan	15,399	30,619	44,038	55,646	58,978	23,424	228,106
Sensitivity	Proposed GHG Rule Build Plan	15,386	30,271	53,490	64,996	74,032	31,081	269,255
Sensitivity	Retirements - 2032/2034 Build Plan	15,401	29,954	42,310	51,900	56,149	22,437	218,150

Appendix F: Residential Bill Impacts for the Twenty-Two Cases

Typical Residential Bill @1000 kWh/month under Reference Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	146.30	152.34	145.36	143.73	143.45	150.86	153.80	162.53	172.71	177.39	183.30	186.92	200.51	202.53	206.56
2024 Reference Build Plan	146.30	152.36	145.72	144.00	143.17	149.15	152.74	161.04	169.16	173.35	175.34	179.72	190.19	192.57	199.61
High Fossil Fuel Prices Build Plan	146.30	152.35	145.71	143.98	143.16	149.13	152.72	161.02	169.14	173.33	175.32	179.70	190.16	192.54	199.58
Zero Carbon Cost Build Plan	146.30	152.36	145.05	142.67	141.60	147.59	151.08	159.18	168.45	171.49	173.48	177.81	188.69	190.58	200.92
85% CO_2 Reduction Build Plan	146.30	152.35	145.72	144.00	143.17	149.22	151.44	171.93	180.43	183.35	183.42	197.30	204.04	206.55	210.86

Typical Residential Bill @1000 kWh/month under High Fossil Fuel Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	146.30	152.36	145.54	151.65	151.95	159.95	162.46	172.71	183.63	189.01	195.03	198.59	212.61	214.34	218.34
2024 Reference Build Plan	146.30	152.36	145.86	151.74	151.46	158.03	161.23	170.92	179.85	184.75	186.96	191.34	202.22	204.42	211.13
High Fossil Fuel Prices Build Plan	146.30	152.36	145.86	151.73	151.44	158.02	161.22	170.91	179.83	184.73	186.94	191.32	202.21	204.41	211.12
Zero Carbon Cost Build Plan	146.30	152.36	145.22	150.81	150.53	157.15	160.22	169.87	179.97	183.75	185.88	190.20	201.43	203.30	213.72
85% CO_2 Reduction Build Plan	146.30	152.35	145.87	151.76	151.46	158.05	159.84	181.05	190.24	193.66	194.45	206.75	214.26	216.52	220.63

Typical Residential Bill @1000 kWh/month under Zero Carbon Cost Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	146.30	152.36	145.34	142.21	141.89	149.38	152.43	161.27	171.43	175.73	180.87	183.68	190.33	191.58	193.81
2024 Reference Build Plan	146.30	152.36	145.67	142.49	141.64	147.66	151.35	159.75	167.88	171.67	172.86	176.43	179.93	181.62	187.11
High Fossil Fuel Prices Build Plan	146.30	152.36	145.68	142.50	141.65	147.67	151.36	159.77	167.90	171.69	172.88	176.45	179.95	181.64	187.12
Zero Carbon Cost Build Plan	146.30	152.36	145.01	141.05	139.96	146.01	149.60	157.83	167.10	169.74	170.90	174.38	177.81	178.64	186.91
85% CO_2 Reduction Build Plan	146.30	152.35	145.67	142.49	141.64	147.79	150.09	170.76	179.28	181.90	181.18	194.61	196.52	198.55	201.38

Typical Residential Bill @1000 kWh/month under Sensitivity Cases															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Electrification Build Plan	146.30	152.33	145.24	141.50	140.27	147.59	151.29	168.35	176.49	179.58	180.48	182.59	184.59	185.94	191.60
Energy Conservation Build Plan	146.30	152.33	145.61	151.22	150.68	154.34	156.01	165.74	174.45	179.03	181.01	183.97	194.51	196.10	201.23
Aggressive Regulation Build Plan	146.30	152.34	146.05	152.07	152.05	159.97	163.34	182.22	191.24	195.42	197.36	200.74	212.62	215.68	223.49
High DSM Build Plan	146.30	152.32	145.53	143.81	142.91	148.89	151.33	159.74	169.06	172.16	175.20	178.40	188.76	191.19	199.60
Low DSM Build Plan	146.30	152.55	145.98	143.92	143.50	149.18	153.13	161.14	171.05	173.41	176.32	179.24	189.93	192.51	200.69
Proposed GHG Rule Build Plan	146.30	152.77	146.15	144.44	143.37	144.84	146.82	153.26	165.40	170.96	172.58	193.01	201.19	203.43	208.22
Retirements - 2032/2034 Build Plan	146.30	152.35	145.71	143.98	143.16	146.82	148.97	155.37	162.14	169.07	172.34	186.27	195.28	197.79	205.11

Appendix G: Retail Rate Impacts for the Twenty-Two Cases

Retail Rate Impacts (dollars/kWh) under Reference Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	0.1225	0.1276	0.1226	0.1209	0.1207	0.1261	0.1283	0.1341	0.1415	0.1452	0.1495	0.1525	0.1640	0.1657	0.1694
2024 Reference Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1247	0.1274	0.1329	0.1389	0.1423	0.1438	0.1474	0.1567	0.1586	0.1643
High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1247	0.1274	0.1329	0.1389	0.1422	0.1438	0.1473	0.1567	0.1586	0.1643
Zero Carbon Cost Build Plan	0.1225	0.1276	0.1225	0.1204	0.1197	0.1241	0.1267	0.1320	0.1388	0.1414	0.1429	0.1464	0.1562	0.1579	0.1663
85% CO_2 Reduction Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1248	0.1265	0.1411	0.1474	0.1499	0.1496	0.1586	0.1647	0.1666	0.1704

Retail Rate Impacts (dollars/kWh) under High Fossil Fuel Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	0.1225	0.1276	0.1228	0.1288	0.1291	0.1351	0.1370	0.1442	0.1523	0.1567	0.1611	0.1640	0.1760	0.1774	0.1810
2024 Reference Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1335	0.1358	0.1427	0.1495	0.1535	0.1553	0.1588	0.1686	0.1703	0.1756
High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1335	0.1359	0.1427	0.1495	0.1535	0.1553	0.1588	0.1686	0.1703	0.1756
Zero Carbon Cost Build Plan	0.1225	0.1276	0.1227	0.1286	0.1286	0.1336	0.1358	0.1426	0.1502	0.1534	0.1551	0.1586	0.1687	0.1705	0.1788
85% CO_2 Reduction Build Plan	0.1225	0.1276	0.1229	0.1287	0.1285	0.1336	0.1349	0.1501	0.1571	0.1600	0.1604	0.1679	0.1748	0.1765	0.1801

Retail Rate Impacts (dollars/kWh) under Zero Carbon Cost Market Scenario															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Updated 2023 Reference Build Plan	0.1225	0.1276	0.1225	0.1194	0.1191	0.1246	0.1269	0.1328	0.1402	0.1436	0.1471	0.1493	0.1541	0.1550	0.1570
2024 Reference Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1232	0.1260	0.1316	0.1376	0.1406	0.1414	0.1441	0.1468	0.1479	0.1521
High Fossil Fuel Prices Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1232	0.1260	0.1316	0.1376	0.1406	0.1414	0.1442	0.1468	0.1480	0.1521
Zero Carbon Cost Build Plan	0.1225	0.1276	0.1224	0.1188	0.1180	0.1225	0.1252	0.1306	0.1374	0.1396	0.1404	0.1430	0.1456	0.1463	0.1526
85% CO_2 Reduction Build Plan	0.1225	0.1276	0.1227	0.1194	0.1188	0.1234	0.1252	0.1399	0.1463	0.1484	0.1474	0.1559	0.1574	0.1589	0.1612

Appendix G: Retail Rate Impacts for the Twenty-Two Cases

Retail Rate Impacts (dollars/kWh) under Sensitivity Cases															
Build Plan	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**
Electrification Build Plan	0.1225	0.1276	0.1227	0.1193	0.1186	0.1240	0.1268	0.1383	0.1443	0.1469	0.1475	0.1491	0.1507	0.1519	0.1566
Energy Conservation Build Plan	0.1225	0.1276	0.1226	0.1281	0.1278	0.1306	0.1318	0.1386	0.1451	0.1488	0.1504	0.1528	0.1622	0.1633	0.1674
Aggressive Regulation Build Plan	0.1225	0.1276	0.1230	0.1290	0.1291	0.1351	0.1376	0.1508	0.1577	0.1614	0.1629	0.1658	0.1769	0.1794	0.1859
High DSM Build Plan	0.1225	0.1276	0.1225	0.1208	0.1201	0.1244	0.1263	0.1319	0.1387	0.1413	0.1436	0.1463	0.1555	0.1574	0.1640
Low DSM Build Plan	0.1225	0.1278	0.1230	0.1209	0.1206	0.1248	0.1278	0.1331	0.1405	0.1424	0.1445	0.1470	0.1566	0.1586	0.1651
Proposed GHG Rule Build Plan	0.1225	0.1280	0.1232	0.1214	0.1205	0.1219	0.1235	0.1281	0.1370	0.1416	0.1428	0.1561	0.1636	0.1653	0.1696
Retirements - 2032/2034 Build Plan	0.1225	0.1276	0.1227	0.1209	0.1203	0.1231	0.1249	0.1294	0.1347	0.1394	0.1419	0.1522	0.1605	0.1625	0.1684

Appendix H: Levelized Cost and Fuel Cost Comparison for the Twenty-Two Cases

Market Scenario	Build Plan	Fuel ($000)	CO2 ($000)	LNPV ($000)
Reference	Updated 2023 Reference Build Plan	$655,800	$155,082	$2,278,844
Reference	2024 Reference Build Plan	$642,587	$149,046	$2,180,714
Reference	High Fossil Fuel Prices Build Plan	$636,276	$145,389	$2,179,366
Reference	Zero Carbon Cost Build Plan	$734,050	$184,832	$2,205,823
Reference	85% CO_2 Reduction Build Plan	$546,084	$79,521	$2,501,931
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	$871,442	$156,916	$2,496,377
High Fossil Fuel Prices	2024 Reference Build Plan	$852,362	$150,892	$2,392,730
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	$843,928	$147,225	$2,389,287
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	$975,021	$186,904	$2,448,949
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	$707,476	$80,087	$2,665,826
Zero Carbon Cost	Updated 2023 Reference Build Plan	$580,743	$0	$2,047,790
Zero Carbon Cost	2024 Reference Build Plan	$569,941	$0	$1,958,113
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	$564,659	$0	$1,961,319
Zero Carbon Cost	Zero Carbon Cost Build Plan	$647,625	$0	$1,933,557
Zero Carbon Cost	85% CO_2 Reduction Build Plan	$499,281	$0	$2,374,565
Sensitivity Case	Electrification Build Plan	$700,064	$0	$2,091,039
Sensitivity Case	Energy Conservation Build Plan	$773,254	$124,156	$2,171,956
Sensitivity Case	Aggressive Regulation Build Plan	$904,775	$272,826	$2,702,889
Sensitivity Case	High DSM Build Plan	$633,491	$147,029	$2,166,978
Sensitivity Case	Low DSM Build Plan	$642,220	$148,908	$2,187,652
Supplemental Case	Proposed GHG Rule Build Plan	$616,018	$127,510	$2,212,554
Supplemental Case	Retirements - 2032/2034 Build Plan	$657,607	$153,750	$2,190,588

Appendix I: Summary of CO_2 Emissions for all Twenty-Two Cases

Market Scenario	Build Plan	2050 CO_2 Emissions	2050 Reduction from 2005 CO_2	2050 Cumulative CO_2
Reference	Updated 2023 Reference Build Plan	8,560	58.0%	208,725
Reference	2024 Reference Build Plan	8,291	44.1%	201,741
Reference	High Fossil Fuel Prices Build Plan	7,972	84.6%	199,890
Reference	Zero Carbon Cost Build Plan	10,602	54.9%	232,409
Reference	85% CO_2 Reduction Build Plan	2,921	56.3%	159,066
High Fossil Fuel Prices	Updated 2023 Reference Build Plan	8,556	58.0%	225,326
High Fossil Fuel Prices	2024 Reference Build Plan	8,286	44.1%	218,312
High Fossil Fuel Prices	High Fossil Fuel Prices Build Plan	7,967	84.6%	216,415
High Fossil Fuel Prices	Zero Carbon Cost Build Plan	10,600	54.7%	248,981
High Fossil Fuel Prices	85% CO_2 Reduction Build Plan	2,924	56.2%	169,533
Zero Carbon Cost	Updated 2023 Reference Build Plan	8,587	57.9%	208,037
Zero Carbon Cost	2024 Reference Build Plan	8,315	43.9%	201,168
Zero Carbon Cost	High Fossil Fuel Prices Build Plan	7,996	84.6%	199,308
Zero Carbon Cost	Zero Carbon Cost Build Plan	10,650	33.6%	231,944
Zero Carbon Cost	85% CO_2 Reduction Build Plan	2,921	65.7%	158,631
Sensitivity Case	Electrification Build Plan	12,603	50.4%	251,195
Sensitivity Case	Energy Conservation Build Plan	6,502	56.8%	196,847
Sensitivity Case	Aggressive Regulation Build Plan	9,409	56.5%	228,448
Sensitivity Case	High DSM Build Plan	8,201	63.8%	198,886
Sensitivity Case	Low DSM Build Plan	8,260	55.2%	200,977
Supplemental Case	Proposed GHG Rule Build Plan	6,861	0.0%	192,096
Supplemental Case	Retirements - 2032/2034 Build Plan	8,496	0.0%	211,645

Appendix J: Generator Level Performance Data

Availability factor					
Generator	**2019**	**2020**	**2021**	**2022**	**2023**
COLUMBIA CT1	90.6%	78.2%	86.2%	64.7%	76.6%
COLUMBIA CT2	88.9%	77.3%	72.9%	89.0%	61.0%
COLUMBIA ST1	91.4%	80.1%	88.6%	89.5%	77.2%
COPE STATION #1	92.3%	47.5%	92.5%	81.4%	72.3%
FAIRFIELD PS #1	96.4%	90.5%	98.7%	77.8%	97.5%
FAIRFIELD PS #2	96.3%	90.5%	98.8%	77.6%	97.4%
FAIRFIELD PS #3	97.1%	88.4%	99.5%	92.4%	95.8%
FAIRFIELD PS #4	97.1%	88.1%	99.4%	92.1%	95.7%
FAIRFIELD PS #5	90.7%	99.8%	94.2%	96.4%	88.9%
FAIRFIELD PS #6	89.7%	99.7%	94.3%	97.0%	88.9%
FAIRFIELD PS #7	88.4%	97.6%	92.4%	84.4%	88.9%
FAIRFIELD PS #8	88.4%	97.6%	91.7%	86.2%	88.7%
HAGOOD GT #4	98.7%	94.8%	97.4%	98.8%	95.5%
HAGOOD GT #5	96.8%	99.2%	80.8%	99.6%	99.0%
HAGOOD GT #6	99.1%	99.8%	98.8%	99.6%	97.0%
JASPER #1	91.8%	92.2%	86.3%	83.3%	90.9%
JASPER #2	90.8%	89.5%	81.7%	87.3%	92.9%
JASPER #3	90.9%	89.4%	78.6%	87.5%	91.9%
JASPER #4	92.3%	94.0%	88.3%	86.1%	94.6%
MCMEEKIN #1	85.2%	96.2%	82.6%	81.4%	82.4%
MCMEEKIN #2	82.6%	90.0%	87.9%	87.1%	84.9%
PARR GT #3	87.7%	99.7%	97.9%	97.9%	22.0%
PARR GT #4	90.2%	100.0%	97.0%	100.0%	24.6%
SALUDA HYDRO #1	93.5%	68.8%	98.8%	18.2%	93.7%
SALUDA HYDRO #2	74.9%	98.1%	100.0%	86.5%	98.8%
SALUDA HYDRO #3	82.7%	98.9%	100.0%	89.8%	99.2%
SALUDA HYDRO #4	79.0%	95.3%	94.5%	85.4%	90.6%
SALUDA HYDRO #5	62.6%	95.6%	91.3%	93.0%	99.9%
URQUHART #1	92.4%	87.9%	96.6%	88.8%	92.5%
URQUHART #2	92.6%	84.5%	81.2%	89.5%	95.6%
URQUHART #3	78.6%	94.6%	92.1%	98.6%	93.0%
URQUHART CC #5	92.6%	87.9%	96.7%	88.8%	92.5%
URQUHART CC #6	92.7%	87.2%	81.5%	89.8%	95.6%
URQUHART GT #4	94.3%	98.0%	89.8%	89.1%	28.5%
V.C. SUMMER #1	95.9%	91.1%	82.3%	100.0%	87.9%
WATEREE #1	61.3%	73.5%	81.5%	76.4%	37.5%
WATEREE #2	61.6%	10.8%	0.0%	58.3%	80.6%
WILLIAMS #1	74.8%	84.6%	72.2%	72.5%	75.1%
WILLIAMS GT #1	76.5%	0.0%	0.0%	0.0%	0.0%
WILLIAMS GT #2	100.0%	99.8%	99.6%	66.3%	0.0%

Appendix J: Generator Level Performance Data

Annual Forced Outage Rate					
Generator	**2019**	**2020**	**2021**	**2022**	**2023**
COLUMBIA CT1	0.2%	0.5%	8.0%	2.6%	0.1%
COLUMBIA CT2	0.8%	1.2%	8.0%	0.8%	1.3%
COLUMBIA ST1	0.1%	0.1%	7.7%	0.4%	0.0%
COPE STATION #1	0.2%	1.2%	0.3%	10.2%	0.0%
FAIRFIELD PS #1	0.3%	0.1%	0.0%	0.0%	0.0%
FAIRFIELD PS #2	0.6%	0.1%	0.0%	0.0%	0.0%
FAIRFIELD PS #3	0.0%	0.0%	0.0%	0.0%	0.0%
FAIRFIELD PS #4	0.0%	0.3%	0.1%	0.0%	0.0%
FAIRFIELD PS #5	0.0%	0.0%	0.0%	0.1%	0.0%
FAIRFIELD PS #6	1.0%	0.0%	0.0%	0.1%	0.0%
FAIRFIELD PS #7	0.0%	1.5%	0.0%	0.1%	0.0%
FAIRFIELD PS #8	0.0%	1.5%	0.0%	0.1%	0.0%
HAGOOD GT #4	0.1%	0.1%	0.2%	0.1%	1.1%
HAGOOD GT #5	1.1%	0.1%	1.1%	0.0%	0.2%
HAGOOD GT #6	0.0%	0.1%	0.9%	0.0%	2.1%
JASPER #1	0.1%	0.0%	0.0%	0.2%	0.0%
JASPER #2	0.1%	0.0%	0.1%	0.0%	0.0%
JASPER #3	0.1%	0.0%	0.0%	0.5%	0.1%
JASPER #4	0.1%	0.0%	0.0%	1.8%	0.0%
MCMEEKIN #1	3.5%	0.0%	0.0%	3.7%	0.0%
MCMEEKIN #2	0.0%	3.0%	0.1%	0.9%	1.3%
PARR GT #3	2.7%	0.3%	0.0%	2.1%	2.6%
PARR GT #4	0.0%	0.0%	0.9%	0.0%	0.0%
SALUDA HYDRO #1	3.0%	31.1%	0.0%	0.0%	0.0%
SALUDA HYDRO #2	0.0%	1.8%	0.0%	0.0%	0.0%
SALUDA HYDRO #3	0.0%	0.5%	0.0%	0.0%	0.1%
SALUDA HYDRO #4	4.4%	4.2%	0.0%	0.0%	0.0%
SALUDA HYDRO #5	5.8%	4.3%	0.0%	2.5%	0.0%
URQUHART #1	0.4%	0.3%	0.8%	0.6%	0.1%
URQUHART #2	1.9%	3.4%	4.3%	1.4%	0.0%
URQUHART #3	3.6%	2.4%	0.0%	0.5%	1.1%
URQUHART CC #5	0.3%	0.3%	0.8%	0.6%	0.1%
URQUHART CC #6	1.9%	0.8%	4.1%	1.2%	0.0%
URQUHART GT #4	0.5%	0.4%	8.9%	9.9%	69.2%
V.C. SUMMER #1	4.1%	0.7%	7.5%	0.0%	3.9%
WATEREE #1	0.2%	0.1%	0.4%	2.5%	1.2%
WATEREE #2	0.9%	88.1%	100.0%	38.7%	1.6%
WILLIAMS #1	1.8%	0.1%	0.1%	0.5%	0.0%
WILLIAMS GT #1	23.5%	100.0%	n/a	n/a	n/a
WILLIAMS GT #2	0.0%	0.2%	0.0%	0.2%	n/a

Appendix J: Generator Level Performance Data

Annual Capacity Factor					
Generator	**2019**	**2020**	**2021**	**2022**	**2023**
COLUMBIA CT1	79.9%	68.6%	76.7%	59.9%	62.1%
COLUMBIA CT2	77.7%	66.4%	56.6%	76.9%	50.1%
COLUMBIA ST1	57.9%	49.4%	46.5%	44.8%	40.1%
COPE STATION #1	50.9%	26.6%	43.9%	47.3%	37.7%
FAIRFIELD PS #1	9.3%	8.9%	9.5%	3.2%	0.3%
FAIRFIELD PS #2	9.4%	8.4%	9.1%	8.8%	10.4%
FAIRFIELD PS #3	9.2%	8.1%	4.5%	10.2%	10.6%
FAIRFIELD PS #4	9.3%	8.7%	5.3%	10.4%	10.7%
FAIRFIELD PS #5	9.4%	8.3%	8.4%	11.9%	9.0%
FAIRFIELD PS #6	9.4%	8.1%	6.6%	8.2%	3.7%
FAIRFIELD PS #7	9.6%	8.6%	8.4%	7.5%	8.2%
FAIRFIELD PS #8	9.5%	8.7%	6.7%	8.2%	9.7%
HAGOOD GT #4	0.9%	2.1%	2.2%	2.5%	2.2%
HAGOOD GT #5	1.4%	2.1%	3.0%	2.6%	1.6%
HAGOOD GT #6	1.7%	2.6%	3.7%	2.9%	1.8%
JASPER #1	72.2%	74.3%	69.7%	68.4%	70.3%
JASPER #2	75.0%	74.6%	66.9%	71.6%	74.3%
JASPER #3	75.2%	74.5%	67.2%	70.1%	69.5%
JASPER #4	57.3%	58.9%	52.3%	53.9%	56.3%
MCMEEKIN #1	35.1%	45.6%	40.2%	34.9%	29.0%
MCMEEKIN #2	33.7%	47.6%	43.8%	34.0%	37.4%
PARR GT #3	0.3%	0.9%	0.6%	0.6%	0.0%
PARR GT #4	0.4%	1.0%	0.5%	1.0%	0.0%
SALUDA HYDRO #1	14.7%	3.9%	3.2%	3.8%	7.1%
SALUDA HYDRO #2	3.6%	8.3%	4.1%	2.2%	3.1%
SALUDA HYDRO #3	13.5%	24.2%	13.0%	10.5%	10.1%
SALUDA HYDRO #4	9.0%	25.9%	12.8%	4.5%	7.0%
SALUDA HYDRO #5	4.3%	17.8%	6.7%	9.9%	5.6%
URQUHART #1	51.0%	57.0%	63.7%	54.2%	53.6%
URQUHART #2	45.0%	48.3%	53.2%	56.4%	53.3%
URQUHART #3	5.5%	5.6%	11.2%	5.1%	11.3%
URQUHART CC #5	41.8%	46.6%	52.8%	45.4%	44.3%
URQUHART CC #6	36.1%	38.4%	44.6%	46.2%	42.9%
URQUHART GT #4	2.6%	5.2%	6.9%	4.6%	0.3%
V.C. SUMMER #1	95.0%	89.3%	80.6%	101.2%	88.6%
WATEREE #1	37.4%	27.1%	50.4%	34.5%	14.5%
WATEREE #2	31.4%	0.8%	0.0%	25.8%	43.6%
WILLIAMS #1	48.1%	50.4%	45.7%	32.6%	37.4%
WILLIAMS GT #1	0.1%	0.0%	n/a	n/a	n/a
WILLIAMS GT #2	0.1%	0.1%	0.1%	n/a	n/a

Appendix K: Cross Reference to the Requirements of the IRP Statute for an Annual IRP Update and Response to Commission Order No. 2023-860(A)

This section of Exhibit K lists each of the specific statutory requirements for an annual IRP update. Material responsive to these requirements is provided throughout the 2024 IRP Update and is embedded in the modeling and analysis generally. This table cross references the sections of this 2024 IRP Update that most specifically correspond to those requirements:

Act No. 62 58-37-40	Requirement	2024 IRP Update Section
(D)(1)	[A]n update to the electric utility's base planning assumptions relative to its most recently accepted integrated resource plan, including, but not limited to: energy and demand forecast, commodity fuel price inputs, renewable energy forecast, energy efficiency and demand-side management forecasts, changes to projected retirement dates of existing units, along with other inputs the commission deems to be for the public interest. The electrical utility's annual update must describe the impact of the updated base planning assumptions on the selected resource plan.	Energy and Demand forecast (p. 52); Commodity Fuel Price Inputs (p. 60); Renewable Energy Forecast (pp. 68, 117 and Appendix E); Energy Efficiency and Demand-side Management Forecasts (p. 58); Changes to Projected Retirement Dates of Existing Units (pp. 4, 98, 125); Selected Resource Plan Analysis (p. 9, 66, 71, 78, 114)

Appendix K: Cross Reference to the Requirements of the IRP Statute for an Annual IRP Update and Response to Commission Order No. 2023-860(A)

In Order No. 2023-860(A), the Commission directed DESC to review and address the recommendations of the ORS witnesses as part of the Stakeholder Working Group or 2024 IRP Update. This section provides a response to those items.

Order 2023-860(A)	Requirement	Responses
P. 51	The Company is directed to review and address the recommendations of the ORS witnesses . . . as part of the Stakeholder Working Group or 2024 IRP Update. ORS recommendations below:	Each of these matters has been addressed in the Stakeholder Working Group or is available to be addressed at the Stakeholders' suggestion. The Stakeholders and the Company collaborate to set the agendas for these meetings based on the most timely and important issues for Stakeholders. In some case, Stakeholders have prioritized issues other than those highlighted by ORS in its 2023 Report as shown in the agendas, presentation materials and minutes filed with the Commission.
	1. Reserve Margin - DESC should fully document the extreme winter weather statistical analyses and demonstrate that the models reasonably reflect winter loads during extreme low temperatures in future IRPs. The Company should also report on the Company's findings in the Stakeholder Working Group.	The 2023 Reserve Margin Study fully documents the extreme winter weather statistical analyses on which current reserve margins were based and demonstrates that the models reasonably reflect winter loads during extreme low temperatures events. High and low demand forecasts are modeled here to capture the effect of future variations on build portfolios. DESC has continued to discuss load forecast issues with the Stakeholders.
	2. Load Forecast - DESC should perform more detailed analyses to assess the reasonableness of its Residential and Commercial class peak load forecasts in future IRPs, and in particular, the Company should provide support for the assumption that the average peak load per residential and commercial customer will remain essentially constant over the forecast horizon.	DESC has updated its load growth estimates using objectively verifiable system data and continues to test the impacts of future changes in load growth up or down using high and low load growth sensitivity analyses.

	3. Commodity Forecasts - All commodity forecasts, including CO2 forecasts, should continue to be discussed in the Stakeholder Working Group. ORS's recommendation regarding CO2 forecasts is based on the fact that a CO2 tax has never been imposed at the Federal level or by the State of South Carolina, and there are renewable market incentives that could justify a lower price forecast, whereas pending CO2 rules under the Clean Air Act ("CAA") could justify a higher price forecast.	DESC has and will continue to discuss a range of inputs including commodity costs with Stakeholders. The current methodology and ORS' recommendations will inform CO_2 price forecasts in the 2025 IRP Update.
	4. Renewables - DESC should discuss the appropriate modeling of integration costs for renewable resources in the Stakeholder Working Group.	DESC has discussed modeling of integration costs with Stakeholders and explained the adjustments to that methodology that will be used in future IRPs and updates.
	5. PLEXOS Benchmarking - DESC should be required to conduct production cost model benchmark studies on an on-going basis, such as once every three years ahead of Comprehensive IRP proceedings, and the Company should discuss benchmarking results in the Stakeholder Working Group.	In 2022, DESC benchmarked its PLEXOS model and shared the methodology and results with Stakeholders. DESC will benchmark the PLEXOS model again prior to the 2026 IRP and every three years thereafter.
	6. Risk Analysis - DESC should evaluate additional ways to incorporate robust risk analyses such as assessing portfolios across multiple planning scenarios. As part of this evaluation, the Company should consider the importance of making near- term decisions that feed into the Company's Action Plan. The Company should discuss this topic in the Stakeholder Working Group.	DESC has assessed 12 Build Plans against eight planning scenarios for a total of 22 cases. The Company carefully evaluates the near-term decisions needed to implement its short-term action plans and is open to discuss any relevant issues related to these matters with Stakeholders.
	7. Transmission - DESC should update the Commission on the transmission impacts and the natural gas pipeline capacity availability associated with unit retirements and new resource decisions. The Company should file the results of the 2023 TIA Study, including all workpapers and supporting documentation when it becomes available.	The requested update concerning the transmission impacts and the natural gas pipeline capacity availability associated with unit retirements and new resource decisions can be found on pp. 23-24 of the 2024 IRP Update. The Company has filed the 2023 TIA Report with the Commission in docket 2023-9-E. The 2023 TIA Report fully documents its findings and the final cost tables were provided in the report.

Appendix K: Cross Reference to the Requirements of the IRP Statute for an Annual IRP Update and Response to Commission Order No. 2023-860(A)