Committee on Energy and Commerce – Energy Subcommittee – Testimony of John Williams, Senior Vice President of Technical Services and External Affairs, Southern Nuclear Operating Company, Inc.

Chairman Latta, Ranking Member Castor, and Members of the Subcommittee,

My name is John Williams, and I serve as the Senior Vice President of Technical Services and External Affairs for Southern Nuclear Operating Company (Southern Nuclear), which is a subsidiary of the Southern Company (Southern Company).[1] On behalf of the approximately 28,000 employees at Southern Company, including Southern Nuclear's 3,900 employees and our affiliates and partners who co-own the eight nuclear units we operate, thank you for the opportunity to testify today about an issue that is critical to the nation's economy, energy security, and national security: nuclear power. The safe and economic development of new nuclear power is essential to maintaining the United States' global energy dominance as our nation moves with speed to meet unprecedented near- and long-term growth. Southern Company is an innovator in the commercial nuclear industry, having completed the first two next generation reactors in the United States in over thirty years, and achieving over a 20% improvement in cost from the first to the second unit.

Introduction to Southern Company

Southern Company is a leading energy provider serving 9 million customers through its family of operating companies, including Southern Nuclear. Southern Company has electric operating companies in three states (Georgia, Alabama, and Mississippi), natural gas distribution companies in four states, a competitive generation company, a leading distributed infrastructure company with national capabilities, a fiber optics network, and telecommunications services.

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[1] *Southern Company is a holding company that conducts its business through its subsidiaries; accordingly, unless the context otherwise requires, references in this testimony to Southern Company's operations, such as generating activities and employment practices, refer to those operations conducted through its subsidiaries.* Southern Company's subsidiaries include Georgia Power Company, Alabama Power Company, Mississippi Power Company, Southern Nuclear Operating Company, Southern Company Gas, Atlanta Gas Light Company, Chattanooga Gas Company, Nicor Gas Company, Virginia Natural Gas Company, Southern Power Company, PowerSecure, and Southern Telecom.

Across the Southeast, Southern Company and its subsidiaries have been delivering on the President's energy dominance agenda by providing our customers with reliable and affordable energy that supports economic growth, including from data centers, when many other regions of the country are unable to do so. With the recent and projected extraordinary increase in energy demand in the Southeast, we have responded by rapidly expanding all aspects of our system by optimizing our existing infrastructure (e.g., gas, nuclear, and hydro uprates, grid enhancing technologies, etc.) and by timely developing substantial new infrastructure. As we invest in reliably serving our communities and growing economy, affordability remains our top priority. Across our service territories, our retail electric rates remain more than 10% below the national average and have risen less than inflation over the last five years. We do not expect our base electric rates to increase. In fact, our two largest subsidiaries, Alabama Power Company and Georgia Power Company, have implemented multi-year rate freezes for existing customers in an effort to provide more certainty around electric rates at a time when many other costs are rising.

Southern Company's orderly and transparent planning processes are intentionally designed to serve growth and have been quickly evolving to help our operating companies serve extraordinary growth from increased manufacturing and data center development. Across our service territory, Southern Company is ensuring that serving growth will not come at the expense of affordability. Thanks in large part to our planning processes and local constructive regulation, our states and Southern Company have ensured that everyday residents and customers *benefit from* this extraordinary data center growth opportunity. This outcome sets the Southeast and Southern Company apart from many energy providers and regions in other parts of the country.

For example, just last month, Southern Company's largest subsidiary, Georgia Power Company, received approval for approximately *10 gigawatts (GW) of power generation resources* from a variety

of energy sources, *including 7 gigawatts of new generating facilities, which the company will start building this year*. With approval of this new generation portfolio, combined with additional resources already under construction, Southern Company expects to add new power generation to our grid each and every year going well into the next decade. Additionally, Georgia Power Company received approval earlier this year for one of the largest transmission expansion plans in the company's history, with the development of nearly 1,000 new line miles of transmission across Georgia to meet demand. Remarkably, while prices are rising across much of the rest of the country, Georgia Power Company will invest in this significant infrastructure expansion *and* has agreed to file its next base rate case in a manner that will ensure the incremental revenue from large load customers delivers savings of approximately $102 per year for the typical residential customer beginning in 2029.

Southern Company's ability to deliver power that is both affordable and abundant is a testament to the vertically integrated, state-regulated market structure that drives much of the Southeast region of the United States. Under the careful oversight of the state public service commissions in Georgia, Alabama, and Mississippi, Southern Company's electric operating companies holistically plan for all aspects of the energy value chain (generation, transmission, distribution, fuel, and demand side options), which results in our companies choosing the least cost, most reliable energy solution to serve customer needs over the long term. That is why Southern Company is pursuing technological solutions ranging from new generating plants to optimizing our existing nuclear and gas facilities with uprates, to grid enhancing technologies, and everything in between.

Southern Company believes that our nation needs all the "tools in the toolbox" to serve this incredible demand, and all forms of energy—including nuclear energy—are considered in our planning process. Preserving viable new nuclear generation options for the benefit of customers is a priority for Southern Company. Southern Company's commitment to nuclear energy is evident and clear: for over fifteen years, Georgia Power Company led the effort to build and finish the only two new large scale nuclear

reactors in the United States in a generation in Vogtle Units 3 & 4. Over the long term, with adequate additional risk mitigations and leveraging the experience gained with Vogtle Units 3 & 4, Southern Company believes customers would benefit from additional new nuclear in the future.

Southern Company appreciates this Administration and Congress's recognition that nuclear energy will play a key role in serving the nation's energy needs, as reflected in Congress's overwhelming support for and subsequent passage of the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act of 2024 (originally the Atomic Energy Advancement Act, an initiative of this Subcommittee), the President's four Executive Orders related to nuclear energy, support for investment tax credits (ITCs) and production tax credits (PTCs) for new nuclear development, and the Department of Energy (DOE) loan programs, such as the Energy Dominance Financing (EDF) Program. There has been real progress in supporting the buildout of new nuclear generation in this country.

Southern Company is committed to keeping new nuclear viable as an option to serve our customers. Before Southern Company can commit to building additional new nuclear generation through its planning processes, additional solutions must also be developed to adequately balance and mitigate certain macroeconomic risks to stakeholders. The risks and challenges to the development of new nuclear projects are well known and documented and include the large initial investment, construction cost, and schedule risks, as well as the substantial credit quality impacts to the sponsors of the project.

The bipartisan support for the development of new nuclear power plants, and the willingness to encourage that development through policy solutions, should help create an environment that mitigates the challenges mentioned above and supports the development of a fleet of new, safe nuclear reactors.

Across the federal government, there are many active efforts to address these challenges and enable new nuclear development, which is providing great momentum for the industry. As it relates to

Congress, there are several actions that could further encourage development, overcome macroeconomic risks, and reduce costs for customers. In addition to the DOE EDF Program loans (which will be critical to any new, large-scale nuclear reactor), Congress could promote the following legislative outcomes to bridge the gap between "first movers" (those who build the first several units) and the "Nth" of a kind plant (i.e., the point where a technology is mature, repeatable, and cost-effective after multiple successful deployments). These outcomes are necessary as the nuclear construction infrastructure continues to recover from decades of inactivity:

1: **Enhanced ITCs to moderate the large initial capital investment associated with the construction of new nuclear plants;**
2. **Federal policy to mitigate "tail risk;" and**
3. **Relaxation of Internal Revenue Service (IRS) limitations on transferability of tax credits.**

This testimony will explore these potential solutions to enable new nuclear development. Additionally, Southern Company is working with large customers to find solutions to mitigate these risks, too.

Southern Company's Nuclear Fleet

Southern Nuclear operates eight nuclear units in Georgia and Alabama, representing over 8,200 megawatts (MW) of nuclear capacity and approximately 20% of Southern Company's total electric generating capacity. As I mentioned earlier, two of our system's eight nuclear units, Vogtle Units 3 & 4, commenced commercial operation in 2023 and 2024. The commissioning of Vogtle Units 3 & 4 added over 2,200 MW of 24/7 carbon free electric capacity to the state of Georgia. Vogtle Units 3 & 4 added over 1,000 MW of capacity to Georgia Power Company alone—at one of the lowest operating costs at Southern Company.

The construction of Vogtle Units 3 & 4 was a tremendous economic stimulus for the state of Georgia and the communities surrounding the Vogtle site. Vogtle 3 & 4 was the largest jobs producing construction project in the state of Georgia. A Nuclear Energy Institute (NEI) study estimates that, at

the peak of construction in 2019, the construction of Vogtle Units 3 & 4 supported over 37,900 direct and secondary jobs, with an average of 21,100 jobs supported annually between 2009 and 2023 (nearly 16,800 jobs regionally and more than 4,300 in the rest of the U.S). Additionally, the NEI study estimated that the construction process generated $4.3 billion in average annual economic output, which includes over $3.1 billion regionally and nearly $1.2 billion for the rest of the country. In total, the study estimated, that the construction of Vogtle Units 3 & 4 provided roughly $65 billion in economic output, including approximately $47 billion in Georgia and the Central Savannah River Area (CSRA). NEI's analysis found that Vogtle 3 & 4 would generate more than $3.9 billion on average annually, with approximately $2.5 billion concentrated in Georgia and the CSRA, in addition to supporting more than 7,900 direct and secondary jobs annually across the U.S.

Now operational, Vogtle Units 3 & 4 support 800 permanent jobs, with hundreds of additional workers on site for outages and supplemental work throughout the year. There are also direct impacts on a number of industries, such as construction, retail, restaurants, and technical consulting services. None of this would have been possible without the support of and a constructive working relationship with our organized labor partners at the North America Building Trades Union (NABTU) and the International Brotherhood of Electrical Workers (IBEW). Additionally, for regulated utilities, the decision to build new generation requires approval by the state public service commission (in the case of Vogtle 3 & 4, the Georgia Public Service Commission). The Georgia Public Service Commission was vital to the successful completion of Vogtle Units 3 & 4, as was the Georgia state legislature and other state and local policymakers.

The construction and subsequent operation of the units represented a number of "firsts" in the United States' nuclear industry. Vogtle 3 & 4 were the first units to utilize the Nuclear Regulatory Commission's (NRC) 10 CFR Part 52 Combined Licensing Process, were the first units to receive permission to begin

construction since the 1970s, and were the first Westinghouse AP1000 units to be constructed in the United States.

While there is uncertainty with any first of a kind design and construction, Southern Nuclear and the Vogtle co-owners experienced several extraordinary, macroeconomic events that impacted the cost and schedule of Vogtle Units 3 & 4. Just months before Vogtle Units 3 & 4 received its Combined License (COL), the tsunami that caused the accident at the Fukushima plant in Japan occurred, which caused delays in the issuance of the COL for the project. Then, the prime engineering, procurement and construction (EPC) contractor, Westinghouse Electric Company, declared bankruptcy in the middle of the project, which caused Southern Nuclear to have to assume control of the project as prime contractor, replace the fixed price EPC Agreement with a cost-plus Construction Completion Agreement with Bechtel, re-estimate the entire project and secure regulatory approval to complete the project from the Vogtle co-owners and the Georgia Public Service Commission. Finally, the Coronavirus disease 2019 (COVID-19) pandemic occurred, which caused massive absenteeism and disrupted construction schedules during 2020 and 2021. Each of these macroeconomic events exacerbated the fact that the domestic nuclear development industry was already suffering from decades of inactivity.

Importantly, the federal government's support through the DOE loan guarantee and PTCs helped to partially mitigate the impact of these unprecedented events. With that support and despite the challenges, Southern Nuclear, the co-owners of Plant Vogtle, and their contractors persevered and ultimately delivered on the promise of generating over 2,200 MW of electricity to the citizens of Georgia with the commissioning of Vogtle Units 3 & 4. While this support could not alleviate all of the financial impacts of both "first mover" risk and the macroeconomic events that were outside of both Southern Company's and the government's control, it demonstrated the significant importance of partnership with the federal government on first of a kind, major energy infrastructure projects. Importantly, electricity customers in Georgia benefitted from federal support as customers are enjoying over $500 million in

long-term economic benefits from DOE loans leveraged to finance the construction of Vogtle Units 3 & 4 and are benefitting from PTCs for nuclear generation during the initial years of the units' operational lifespan. All of these financial benefits went straight to customers.

Since the construction of Vogtle Units 3 & 4, Southern Company continues to look toward the future of nuclear power. We are investing in the modernization and expansion of our system's existing fleet through digital upgrades and power uprates—if awarded, DOE EDF Program loans will help provide significant cost savings to customers for these uprate projects—and in the life cycle of the fleet through subsequent license renewal.

Southern Company and its partners not only accepted the risk of constructing two first of a kind reactors but succeeded in demonstrating that utilities and strong state and local partners are best positioned to construct large-scale nuclear generation. With the support of the new construction incentives like loan guarantees and PTCs that mitigated the impact on customer rates, as well as the constructive engagement of customers, policymakers, labor partners, regulators, and investors, this dedicated group of "first movers" completed the job and demonstrated, though difficult and even arduous at times, that private industry in the United States is capable of constructing the next generation of safe, reliable nuclear capacity.

Leveraging Lessons Learned from Vogtle 3 & 4

As the construction of Vogtle Units 3 & 4 progressed, the lessons learned during the construction of Unit 3 began to be realized in the completion, testing, startup, and commissioning of Vogtle Unit 4. This

is reflected in 20% lower costs and half the testing and startup time for Vogtle Unit 4 relative to Vogtle Unit 3.

Successive AP1000 units can also benefit from these lessons learned on Vogtle 3 & 4. The “design once, build many” approach to the construction of a nuclear fleet means that each successive AP1000 unit can benefit from the experience gained on prior units. This is in contrast to the “design many, build once” approach that characterized nuclear construction in the United States before the advent of standardized designs.

Chief among the benefits from the Vogtle experience is the resolution of a technology risk and mitigation of a licensing risk associated with the AP1000. Although the AP1000 design had been certified by the NRC before construction of Vogtle Unit 3 began, the detailed engineering and construction documents were not complete, and the units had never been constructed or tested in the United States. Many man hours of engineering and design work had to be completed after the receipt of the Vogtle COL, which adversely impacted estimating, procurement, scheduling, and construction productivity.

Because of the construction of Vogtle Units 3 & 4, the detailed design of the AP1000 is now complete and ready to construct, alleviating the design issues for future plants. We now understand the quantity of construction commodities necessary to complete the plant and the most efficient construction sequences much better than when we began construction on Vogtle Unit 3. Similarly, the initial testing of the completed Vogtle Units 3 & 4 was a regulatory requirement. The Vogtle AP1000s have now been fully tested and have a cycle of operation behind each of them, largely eliminating this regulatory and technology risk.

In addition, Southern Nuclear successfully completed licensing under 10 CFR Part 52, including the demonstration that all inspections and tests satisfied the acceptance criteria in the COL (the

Inspections, Tests, Analyses, and Acceptance Criteria, or “ITAAC” process). The NRC now has a much better defined and proven licensing process, which will benefit future applicants.

Finally, the construction workforce and field supervision were trained and became experienced in nuclear quality requirements in addition to a nuclear supply chain that began to develop. Even other large light water reactor designs and Small Modular Reactors can benefit from Vogtle's training of a nuclear construction workforce, modular construction techniques, and startup testing regime. In order to achieve the number of new nuclear units needed, further development of the nuclear construction infrastructure will be required. We are not yet where we need to be, but because of the construction of Vogtle Units 3 & 4, we have a much better understanding of what will be required in order to make nuclear energy cost competitive with other forms of generation.

Bridging the Gap from First of a Kind to “Nth” of a Kind

The growing demand for electricity, together with the Administration’s leadership and a bipartisan majority of Congress, has created great interest in pursuing new nuclear development. A variety of technologies and plant sizes are under consideration by an ever-increasing number of potential developers with varying risk tolerance and financial and technical capability. Any of these potential developers have or will come to the realization that the cost and schedule risk of new nuclear construction is significant, and that before the cost of new nuclear plants can be made competitive with other forms of generation, the gap between the cost and risk of a first of a kind plant and the “Nth” of a kind plant must be bridged. These costs and risks include:

1. Initial Capital Investment (high initial investment cost compared to other available generation alternatives);
2. “Tail Risk” (construction schedule delays and unanticipated costs due to unforeseen macroeconomic events); and

3. Cash Flow/Credit Risk (possible credit downgrades due to the significant impacts these projects have during the construction period).

Importantly, any federal support to address the challenges associated with nuclear development are not designed to completely derisk nuclear construction projects or to "prop up" the nuclear industry indefinitely. Indeed, private industry, private equity, hyperscalers, and other partners understand that nuclear construction—like any large-scale construction project—carries risk. Even though many of the challenges associated with new nuclear development were reduced or fully retired with the construction of Vogtle Units 3 & 4, certain challenges remain—in large part because no other companies built new nuclear units after Vogtle 3 & 4 and many of the advances achieved during the development of Vogtle Units 3 & 4 have somewhat atrophied. These challenges should be addressed so that private industry can bring more nuclear power to our country's grid.

Initial Capital Investment/Total Cost of Nuclear Relative to Alternatives

The precision required in nuclear fabrication and construction makes nuclear plants comparatively more expensive to build compared to other forms of generation, and the absence of a well-developed supply chain and trained work force in sufficient numbers exacerbates this problem. The construction of Vogtle Units 3 & 4 was not enough to reestablish this supply chain, because no entity began construction of other units, and many of the advances that were made in both the nuclear workforce and supply chain have atrophied somewhat since Vogtle Unit 4 completed construction in 2023. Domestic production of components and long-lead items, such as large forgings, remains insufficient to meet expected demand, forcing them to be imported at a high cost.

Tail Risk

Another risk inhibiting the construction of new nuclear power plants is "tail risk," i.e., the risk that extraordinary events will disrupt construction productivity, supplies of components, workforce, regulatory burdens, or other factors that delay progress and drive-up costs. The construction of Vogtle

3 & 4 is a textbook example of how these kinds of events, over which the developer has no control, can cause disruption, impede progress, and raise costs.

Overcoming these externalities makes it difficult to plan for new projects without inordinate risk to customers or investors. These costs and risks are somewhat easier to quantify with respect to large light water reactors, such as the AP1000 design, but the national infrastructure remains insufficient to execute more than one or two projects simultaneously.

Cash Flow/Credit Risk

Each of the above factors also contribute to a third major financial impediment that must be overcome if the United States is to achieve its full potential in nuclear generating capacity. The size and uncertainty of capital costs, pressure on cash flow, and the duration of the construction process can have significant negative impacts on the credit ratings of the developer. A downgrade in credit rating, in turn, would limit the developer's access to the capital markets, increase its overall cost of capital, create even more risk for the developer, and increase costs for the project's customers.

The Administration and Congress have already taken meaningful actions, as noted above, to mitigate the risks inherent in large-scale project construction of first of a kind technology. That said, additional support is needed to avoid requiring a single company's customers and investors to bridge the gap.

Risk Mitigation Concepts to Encourage Nuclear Development

The Administration and Congress can be key partners in mitigating and addressing these challenges, which in turn will encourage investment in new nuclear generation. The Administration's support for nuclear power through policy initiatives such as ITCs, PTCs, loan guarantees, and "tail risk" protection can benefit and protect customers and also reduce the risk to investors of a single or small subset of

companies in new nuclear designs, technologies, and development, including the relatively high initial investment costs of “early mover” nuclear projects.

More specifically, new nuclear construction will provide benefits nationwide in the form of economic development, national security, and energy dominance. The financial burden of rebuilding the nation’s nuclear infrastructure, the risks of delays and “tail risk” associated with the initial reactor deployments, and the negative impact on the individual developers’ credit ratings and the cost of capital from financing such large investments are risks that no single company’s investors and customers should endure alone. Moreover, public utility commissions (or public service commissions) in regulated states are unlikely to allow customers to shoulder such burdens when alternative power generation options exist. And unregulated entities are even more unlikely (and potentially unable) to take such long-term risks, further demonstrating our country’s current difficulties in getting new nuclear generation off the ground.

The reluctance of the regulators, investors and customers of individual companies to take on the financial cost and risk associated with being a “first mover” in new nuclear is understandable. Still, the Vogtle experience teaches us that the federal government effectively utilized a program of PTCs and loan guarantees to help mitigate the “first mover” risks for Vogtle Units 3 & 4 because it was deemed to be in the national interest to encourage the development of nuclear generation. The same holds true today, and the benefits to the nation offered by the development of a robust, 21st century nuclear fleet mean that it is no less important to encourage investment in new, advanced nuclear power plants with legislative solutions that help mitigate “early mover” costs and risks currently borne by plant developers and their stakeholders.

These proposals fall generally into three categories that address the risks identified above:

1. Risk: closing the gap in initial capital investment for "early movers" and other forms of generation until construction experience with new designs and the domestic nuclear construction supply chain matures sufficiently to bring the construction costs of new nuclear plants down.
    a. Potential legislative consideration: *Enhance ITCs to moderate the large initial capital investment associated with the construction of new nuclear plants. For example, amend the Clean Energy Investment Credit (CEIC) provision to allow new nuclear projects to provide a modest increase to the ITC for "first movers" on nuclear projects; or, amend the tax code to remove the current prohibition on eligibility for the CEIC for taxpayers that claim PTCs under Internal Revenue Code (IRC) § 45Y (26 USC § 45Y).*
2. Risk: "early mover" tail risk.
    a. Potential legislative consideration: *Mitigate "tail risk" and create a federal program that provides cost sharing over a certain threshold of additional, unanticipated construction costs. The Accelerating Reliable Capacity Act of 2024, proposed by Senator Risch, is a good example of this concept.*
3. Risk: the impact on "early movers'" creditworthiness and cost of capital.
    a. Potential legislative consideration: *Amend IRS limitations on transferability of tax credits. Specifically, amend the tax code to eliminate the Section 6418(g)(4) Tax Credit Transfer Restriction to provide "early movers" with more cash flow during construction to mitigate the risk of credit downgrades and the ability to monetize credits based on qualified progress expenditures.*

Additional Federal Opportunities to Encourage Nuclear Development

In addition to the Congressional actions detailed above, the Administration also has a key role in new nuclear development. The President's Executive Orders offered clear support for the nuclear industry, and other agencies like the DOE and the Department of Commerce have also shown strong support for

nuclear power. There are myriad ways that private industry can partner with the federal government, such as leveraging a host of different financing structures as well as creative solutions around challenges like supply chain and workforce. Southern Company looks forward to continued engagement with the Administration regarding efforts to support new nuclear development for the benefit of all customers and our country. Moreover, Southern Company is also interested in engaging with large customers to develop creative partnerships to enable new nuclear advancement.

Conclusion

Chairman Latta and Ranking Member Castor, thank you for the opportunity to testify before the subcommittee today. Our nation is on the precipice of an incredible opportunity to bolster our national security through dominant energy outcomes, which are, of course, a direct outcome of sound energy policy. Nuclear energy remains one of the most important tools for meeting unprecedented demand in a reliable and affordable way. There are certainly challenges with nuclear development—especially the first tranche of plants that companies will pursue over the next several years—but there are also incredible opportunities for customers and for our nation if the federal government can implement sound energy policies to mitigate obstacles associated with new nuclear development. The leadership and employees of Southern Company are committed to continuing to be part of the solution to these challenges so that we can deliver on the promise of American technology, as our company has been doing for over 100 years.