Questions for the Record from The Honorable Robert E. Latta

1. **We all agree on the importance of modernizing our infrastructure to ensure we reliably get power to AI data centers. As the co-chair of the Grid Innovation Caucus, I am interested in grid enhancing technologies that improve the performance of the transmission system. An example is the use of advanced power conductors that can double capacity of the grid using the same right of way.**

   Can you please comment on this approach to ensure we get the most out of the current grid by deploying modern technology?

   Response:
   Grid-enhancing technologies (GETs) such as advanced reconductoring have the potential to bring additional capacity to the transmission system. GETs includes a portfolio of transmission grid-connected technologies focused on increasing grid capacity and enabling the reliable integration of inverter-based generation resources such as solar and battery energy storage systems (BESS). Therefore, GETs are part of the solution to serve the growing energy demands of data centers and other large load customers, so the grid has the capacity to serve them both for producing the power they need to consume and the delivery of that power to the end-use customers. Southern Company has a vast GETs portfolio. Some types of GETs have been tested and are in scaled deployment across Southern Company's transmission grid such as advanced conductors, and some are still in the early stages of development such as dynamic line rating (DLR). Southern Company remains committed to collaborating with industry partners like the Electric Power Research Institute (EPRI), other utilities, and vendors to test and evaluate all GETs that could benefit customers and increase the transmission capacity to serve them without compromising grid reliability.

   Each type of GETs has different use cases and considerations for deployment to ensure it is the appropriate solution for customers and the grid. Advanced conductors are already being deployed at scale across the Southern Company transmission grid to help increase grid capacity where needed to ensure grid reliability and serve customers. When an advanced reconductor opportunity is considered, it's also important to note that transmission lines are an interconnected network on which capacity additions must be considered holistically. Road widening offers a good analogy: when a highway is widened to alleviate a chokepoint, the chokepoint does not disappear, it simply moves to another part of the highway network – and that second chokepoint may (or may not) be less troublesome than the initial one. The transmission system is much the same. Reconductoring one transmission line might create more capacity on that one segment, but added capacity is only beneficial if it is matched by equal capacity upgrades on every connected line impacted by the flow of electricity. Such a prospect is neither an easy nor cost-free solution. Efforts are underway on many parts of the transmission system to evaluate whether advanced grid technologies can be a cost-effective solution or whether wholly new construction is necessary. Cost-effective solutions for transmission are highly location-specific, meaning that grid technologies will play a meaningful role in grid expansion, but are not a singular solution for meeting transmission needs.

Grid-enhancing technologies can play a role in efficient transmission system operation and may create additional transmission capacity under certain conditions. But these types of technologies cannot simply be deployed across the entirety of the transmission system and create new capacity everywhere. Rather, they are useful in certain instances to assist in transmission system operation. The current demands on the grid, and load growth that energy providers across the country are expecting/experiencing, requires an "all of the above" approach so it's important to consider these technologies as part of the solution set but not the only focus. It requires investment in new generation, new distribution, and new transmission.

2. **Economic Development and Forecasting Consistency: Accurate and transparent electricity load forecasting is a linchpin of modern economic development. States rely on these forecasts to plan new industrial parks, data centers, and manufacturing hubs, while utilities use them to schedule grid expansions and major infrastructure investments. Despite the vital role of load forecasts in spurring economic growth, practices vary widely among states, often leading to inconsistent data, misaligned investment signals, and unnecessary risk for both utilities, and both large and residential customers. Concerns have been raised that a patchwork of forecasting methodologies can exacerbate speculation in large load interconnection requests, inflate demand projections, and drive- up costs.**

   Recognizing these issues cross both state and federal jurisdictions and regional differences, how do you think Congress can play a role in establishing a baseline of consistency across state jurisdictions that will help align economic development strategies with reliable, cost-effective grid planning?

   Response:
   Planning the Utility Grid
   Planning the utility grid and ensuring all customers benefit from load growth requires accurate forecasts, combined with appropriate risk mitigation. This combined approach supports the prudent expansion of generating capacity and transmission networks. Forecasts must take into account the unique jurisdictional aspects of the customer base that the utility serves, and the state public service commission oversees. By working within the state jurisdiction, appropriate risk mitigations such as pricing, minimum bills, and upfront payments can be developed to protect ratepayers if expansion plans of new loads do not match forecasts. This approach is most effective in vertically integrated markets where the state regulatory commission has a complete top-to-bottom view and review of the utility plans and mitigations.

   Load Forecasting
   Load forecasting is critical to sound integrated resource and system planning. As a highly technical practice, load forecasting involves specific statistical and econometric techniques. The approach will differ by utility based on each utility's own load forecasting experts who know its system best. However, the high-level objective of all load forecasters remains the same: understanding demand sufficiently to ensure reliability. National load forecasting models, though potentially helpful for macro-policy discussions, lack the granularity of individual utility load forecasts.

Regulated Utility Model
In the regulated utility model, state public service commissions with specific subject matter expertise oversee these activities for utilities subject to their regulation. This model provides certainty to utilities and benefits customers. It can flexibly adapt to changing industry practices while ensuring that utilities with an obligation to serve engage in prudent planning and execution of investments to meet the needs of the grid and customers.

Congressional Support
Congress can be supportive by understanding that load forecasting efforts serve different purposes. The question being asked or the goal at hand must be matched to the right kind of forecast. To this end, Congress can rely on companies like Southern Company and other utilities to be good partners in explaining the needs of specific states and regions and providing the best information about energy demand for the areas we serve. All planning processes benefit from good information. The Department of Energy (DOE) has a long track record through various data collection mechanisms, energy consumption surveys, and annual energy outlooks that provide valuable information to supplement local forecasts. Continuing to invest in and maintain DOE's current activities and exploring potential new data resources would be valuable to the industry. Combining cost-effective federal data collection and top-level outlooks with the strength of state jurisdiction planning and risk mitigation will greatly enhance the ability to meet the challenge of load growth for the new industrial and digital age, benefiting all customers.

3. **AI's Impact on Demand Growth: How do you anticipate AI-driven applications – such as advanced data analytics, machine learning, and robotics – will change overall electricity load profiles, and what specific policies or grid modernization efforts might be needed to manage these new demand patterns?**

Response:
As discussed during the hearing, electricity load profiles are already changing due to data centers. The specific AI-driven applications you note are not uniform in their impact: advanced data analytics and machine learning are increasing energy demand, while advanced robotics have the potential to bring efficiency to business applications and, therefore, reduce demand at some point. For the foreseeable future, though, data centers and AI mean one thing: more demand for electricity. Some AI data center loads exhibit unique behaviors that, if unmitigated, can impact the overall grid's reliability and stability. Utilities' structures where bulk electric grid planning and operations is closely connected to their customers, are particularly well-positioned to identify and mitigate these unique behaviors.

These customers also present challenges not just because of their size but because they have constant demand, that is, they demand about the same amount of energy in every hour of the day. These expected "high load factor" customers require tailored contracts and pricing arrangements. Utilities need the flexibility – within their states and the regions they operate – to manage these customers and integrate them thoughtfully and as approved by state regulators. Transparent information from the data centers to the utilities about the operational characteristics of their demand/load will also be critical to ensure accurate forecasts and therefore appropriate infrastructure development.

The size of these new customers and their high load factors will also require investment into the grid and advanced planning to meet the energy and capacity needs created by their service requirements. Fortunately, state-regulated integrated resource planning is well-suited to facilitate new generation, transmission, and distribution investment in a cost-effective manner. Integrated resource plans are regularly submitted to state public service commissions and reviewed through established processes, followed by generation procurement and investment to meet the identified needs.

4. **Does your company have the tools that it needs to build the generation necessary to meet both the energy demands of large customers and the energy needs of your everyday customers? And please explain why?**

   Response:
   Yes. As described in response to the previous question, state-regulated integrated resource planning, as well as the associated procurement and investment, are the most important tools to build necessary generation and infrastructure prudently and timely. Integrated resource planning processes must be flexible and allow for timely generation procurement, and our company is fortunate to operate under structures in the states we serve that allow us to do exactly that. Moreover, our holistic planning process ensures that we are both appropriately forecasting for this demand and ensuring a robust and diverse portfolio is then developed and deployed to meet the energy needs of all of our customers affordably and reliably. The result: abundant energy supply designed to keep the lights on and the gas flowing.

   Importantly, as a result of the state regulated IRP construct and the bilateral market in which our regulated utilities operate, Southern Company has demonstrated it is one of the best positioned companies in the industry to invest in large generation and associated energy infrastructure projects, including long-term contractual commitments which enable the construction of new natural gas pipelines. (Some in our industry operating in "centralized markets" are limited in their ability to make long-term commitments due to a misalignment in market incentives.) The bilateral market provides an advantageous contracting environment allowing us to quickly develop customized solutions and respond to rapidly changing market demands. The partnership(s) with our state regulatory agencies and our commitment to treat electricity as a necessity instead of a commodity ensure we take prudent steps to make certain our customers are the ultimate beneficiaries.

   Against this backdrop, there are areas for positive policy development, including permitting reform such as revisions to the Clean Water Act, NEPA, and the Endangered Species Act to ensure that energy companies can timely build energy infrastructure to meet growing demand for power.

5. **When a generation customer connects to the system what is expected from them and what are the impacts to the system? Is Southern Company's interconnection process working quickly to get projects studied then interconnected if a customer decides to move forward?**

Response:
With regard to Southern Company's generator interconnection queue, we maintain a very efficient and effective process which results in the customers executing an interconnection agreement under our Open Access Transmission Tariff within 15-18 months, starting from the time a generator customer's application to interconnect is received. Construction timelines vary of certain transmission system upgrades required to support a generator's actual interconnection to the grid based on the complexity of the configuration, size of the facility, and location on the grid; however, it typically takes 36-48 months from execution of the interconnection agreement to the in-service date of the transmission system upgrades which allows a generator to achieve commercial operation.

As far expectations from the generator customer connected to the grid, Southern Company requires a generator to comply with all posted technical and operational requirements consistent with current NERC and IEEE standards. These include meeting certain operating requirements such as power quality standards and maintaining proper reactive and voltage support in order to support the efficient and reliable operation of the Southern Company transmission system.

A) **Please explain the importance of natural gas pipelines and specifically firm gas.**

Response:
Natural gas pipelines (and associated storage) are a critical component to reliably deliver natural gas to meet the increased energy demand growth we are seeing across the country. Natural gas is preferable in many power generation applications because of its emissions profile and competitive prices compared to other fuels, as well as the flexibility it provides as a dispatchable fuel source that can be utilized for both peaking and baseload power generation. These natural gas pipelines are essential in providing access to the abundant supplies of natural gas in the United States by transporting gas from major supply basins to areas of specific demand.

The term "firm gas" refers to a gas supply service offered by pipelines *guaranteeing* delivery during all time periods covered by the agreement. Firm gas deliveries are prioritized and not subject to interruptions or curtailments, except in very extreme circumstances. In contrast, "interruptible gas" refers to a gas supply service which can be curtailed or interrupted during periods of high demand or low supply.

The cost of interruptible gas service is significantly less than firm gas service because of its inherent lack of reliability as it is only paid for when it can be utilized."
Underpinned by our duty to serve and belief that electricity is *essential* and not just a commodity, Southern maintains firm gas contracts to ensure fuel delivery for our gas generation resources and reliable electric service for our customers.

Importantly, due to the significant cost of natural gas pipeline infrastructure, long-term commitments for "firm gas supply" are required prior to construction in order to secure appropriate financing. In other words, pipeline customers must commit to procuring set amounts of natural gas over a long-term period, often in the range of twenty years.

Southern Company's vertically integrated, state regulated market structure holds us accountable for ensuring that gas is available, and we are therefore held accountable for procuring firm fuel, including firm gas. We similarly invest in gas storage systems, as appropriate, to ensure that sufficient gas is available if there are constraints on the pipelines. Notably, our customer rates are competitive with other utilities who do not procure "firm gas."

Increasing energy demand, the need for firm gas supply, and the need for natural gas pipelines are all interconnected. Natural gas generation is essential to meeting rapid load growth. Natural gas infrastructure to support the needed firm gas supply required is imperative for the future of grid reliability.

B) **What areas of the country develop firm gas? What happens if firm gas is not developed?**

Response:
Markets like the vertically integrated, state regulated Southeast are held accountable for investing in a firm gas supply to ensure reliable and affordable energy for customers. Most other areas of the country – especially some RTOs – are not incentivized to invest in large natural gas infrastructure projects and associated storage assets, which is one of the main reasons that many of those areas (e.g., New England) remain pipeline constrained: the lack of firm gas commitments has resulted in insufficient gas infrastructure development.

When the existing gas infrastructure cannot keep up with the increased demand for natural gas, end-use customers will ultimately be forced to bear the burden of increased reliability risk and the associated consequences. History has shown that these consequences can be dire for those who lose electricity and natural gas in their homes during times of extreme weather. Electricity and natural gas have become essential, and cannot be viewed upon only as a commodity.

6. The Southeast is not in an RTO. Why not?

Response:
Meeting energy needs in a load growth environment requires the ability to plan the system and deploy capital in a timely manner to develop necessary infrastructure. RTO/ISO planning processes remain inferior to state-based integrated resource planning processes in this regard; moreover, even in constructs where integrated resource planning occurs at the state level with the RTO structure overlaid on that planning, it introduces complexity and slows down the ability to make necessary investments. RTOs rely on scarcity to incentivize investment while vertically integrated, state regulated markets like that in the Southeast favor energy abundance to ensure reliable, affordable energy for customers. Recent headlines report that RTO capacity markets continue to be challenged in incentivizing infrastructure investment while simultaneously reporting unprecedented forecasts for load growth. The state regulated integrated resource planning construct has proven to be the best model to meet this challenge.

The drawbacks mentioned above, paired with the high administrative costs of RTO/ISO participation that our customers would have to pay, result in a simple conclusion: RTO/ISO participation does not benefit our customers.

A) **Are there alternative enhancements to the Southeastern market that you are exploring?**

Response:
State-based integrated resource planning is uniquely agile and capable of evolving to meet rapid changes in the power sector. SEEM is one example of an enhancement to the Southeast bilateral market. We developed a market structure with partners (other energy providers in the Southeast) to allow for purchases and sales of energy across a broader footprint, enhancing the efficiency of our existing investments and the infrastructure of the region. SEEM was implemented without impacting or detracting from the benefits of integrated resource planning and the investments that come out of that process. Like integrated resource planning, SEEM is well-positioned to evolve to meet needs in a dynamic environment without the uncertainty, costly bureaucracy, and constant rule changes observed in many RTO structures. We will continue to evaluate enhancements to SEEM, with the need for enhancements determined based upon whether they provide benefits to our customers.

As an additional example, the vertically integrated, state-regulated, bilateral market in which Southern Company participates provides the most orderly and efficient way to interconnect generation. Unlike the RTO/ISO's, Southern Company's generator interconnection queue has no backlog of generators waiting for interconnection agreements and there have been no late studies over the past 5+ years. This is directly attributable to the orderly, IRP-driven model that exists in Southern Company's territory.

7. Regarding planning for transmission, what specific impediments have you identified to current state and regional planning for the siting of transmission projects?

Response:
We have not encountered any specific impediments through current state or regional planning for the siting of transmission projects. In the Southeast, transmission planning is primarily driven by state-regulated integrated resource planning (IRP) and resource procurement processes that often results in request for proposal (RFP) processes. Since transmission planning in the Southeast is driven by these state-regulated processes, state support for the resulting transmission projects and their siting requirements is largely assured.

A) **What are examples of impediments you have identified and what is necessary for system planners to overcome these impediments?**

Response:
This is not necessarily applicable to Southern Company or our operating companies. As explained above, we are not aware of current impediments through transmission

planning for the siting of transmission projects. However, we are concerned about transmission planning becoming overly bureaucratic due to federal regulatory impositions in Order Nos. 1000 and 1920 and the potential creation of “friction points” in the transmission planning process for those opposed to transmission expansion or that want a different system expansion to challenge the implementation of these IRP- and RFP-driven transmission planning. While this had not proven an impediment to date, we are concerned moving forward, particularly as we implement Order No. 1920.

B) **What reforms do you recommend to improve state and regional planning to overcome these impediments?**

Response:
Again, this is not necessarily applicable to Southern Company or our operating companies. As explained above, we are concerned about transmission planning becoming overly bureaucratic and litigious due to federal regulatory impositions. While this has not proven a problem to date due, we are particularly concerned that implementing Order No. 1920’s extensive requirements and processes could prove to be an impediment to the rational and effective expansion of the transmission grid.

8. In the last Congress and the previous administration, there was a lot of talk about transmission policy reform.

A) How does Southern plan transmission in your region and with other regions? What should Members understand about the nature of transmission planning as it exists today?

Response:
Southern’s system planning begins with state-regulated IRP and RFP processes that first identify system needs and then identifies least-cost, reliable options to satisfy those needs, holistically considering supply-side, transmission, distribution, and demand-side considerations. The results of these state-regulated IRP and RFP processes are then combined with long-term reservations made by third parties under Southern Company’s Open Access Transmission Tariff to drive Southern’s transmission planning. For Southern Company, this IRP/RFP-driven transmission planning is subject to significant state public service oversight, with Southern providing their state commissions Southern’s 10-year transmission plan and with those commissions considering the cost, reliability, and other impacts of the resulting transmission projects.

Southern is one of nine Sponsors of the Southeastern Regional Transmission Planning Process (SERTP). The SERTP is located within 12 states and is one of the largest transmission planning regions in the Eastern Interconnection in terms of transmission line miles and peak customer demand. Southern’s transmission plan is combined with those of the other SERTP Sponsors to produce the annual SERTP regional transmission plan. During that process, the SERTP Sponsors perform affirmative transmission planning to determine if there are more efficient or cost-effective solutions than those identified through their underlying IRP- and RFP-driven processes. The SERTP Sponsors also coordinate with each of their 5 neighboring transmission planning regions (PJM, the South Carolina Regional Transmission Planning Process, the Florida Reliability Coordinating Council, SPP, and MISO) with respect to an interregional transmission facility that is located in both transmission planning regions and to identify possible interregional transmission facilities that could address transmission needs more efficiently than transmission facilities in their respective regional transmission plans. Southern also participates in traditional reliability transmission planning through existing SERC Reliability Corporation and Eastern Interconnection Assessment Group (ERAG) processes.

Southern's and the other SERTP Sponsors' IRP- and RFP-driven transmission planning allows them to proactively and holistically considers all reasonably available options to address identified system needs, allowing for the adoption of economic and reliable solutions for the benefit of consumers. Moreover, since this transmission planning is driven by these state-regulated processes, and since the states also provide significant oversight of the resulting transmission expansion, state support for the resulting transmission projects is largely assured, thereby significantly mitigating against potential siting impediments.

B) Does a top-down approach, through FERC, serve the interests of utilities and grid operators that are already expending tremendous time and engineering resources on design new transmission?

Response:
No. Top-down approaches have the potential to disrupt and delay the work on designing and investing in new transmission. Our current IRP- and RFP-driven transmission planning processes allow for the identification of transmission needs and the evaluation of alternatives within the context of broader system planning for our company. Any new overlays at FERC or top-down directives detract from the goal of identifying infrastructure that benefit customers and investing to develop the infrastructure. Moreover, top-down approaches often drive confusion, and even conflict, with existing processes, slowing down investment and in turn delaying the ability to serve loads that provide economic development benefits and jobs.

With respect to any notion about a national top-down transmission planning, Southern believes such a national transmission planning approach would be inappropriate and violate existing jurisdictional separation. Outside of the RTO/ISO regions, collaborative transmission planning exists at the regional level but always with the understanding that each participating utility is responsible for its own balancing authority so that it bears direct responsibility to its customers for the provision of reliable and economic service and so that its least-cost generation serves those customers. These regional efforts are constructive, collaborative, and often identify the best path forward for transmission paths that will benefit an entire region. This process would not be improved with more FERC oversight from a planning perspective.

C) Please explain the value and challenges of colocation, as well as the value of an

interconnected grid.

Response:
"Colocation" generally refers to a large customer siting its operations directly adjacent to and obtaining some portion, or potentially all, of its electricity needs, through direct service from an electric generating plant. (The projects most recently discussed in the news involve colocation at nuclear power plants.) Depending on the specific configuration, colocation can be risky from a reliability perspective, particularly if no connection to the existing grid is planned between either the load or the generating resource. The concentration of reliability risk is significant under such "islanding" conditions. However, if structured appropriately, short-term benefits may exist for large customers like data centers who needed expedited access to baseload power generation--especially in parts of the country outside of the Southeast that are experiencing resource adequacy issues and long interconnection queues.

The challenges of colocation are multi-faceted and complex because each potential colocation project is unique. Configuration can vary significantly in different regions of the country and is influenced by load characteristics, resource types, access to infrastructure, network configuration, market design, as well as various state and federal regulations. Economically, co-located facilities connected to the grid must still pay the appropriate connection charges to ensure that other grid-connected customers are not subsidizing the co-located entity. Independent co-located facilities with no connection to the grid also face significant capital costs to ensure there is enough backup generation to support planned maintenance periods as well as unexpected outages.

We believe the interconnected grid provides the strongest foundation to deliver electricity. Our customers value the reliable, abundant, available, and affordable energy resulting from our grid. Southern Company's energy grid is one of the most advanced grids in the country. As a vertically integrated, state regulated utility, Southern Company utilities are held accountable by our state public service commissions for investing in energy infrastructure that delivers reliable and affordable power to our customers. We operate nearly 27,000 miles of electric transmission across the southeast and have invested almost $25 Billion in power delivery capital since 2015 with plans for another $26 Billion on power delivery in our capital plan for the next five years.

The result: a grid that stands ready to support the federal government, large customers, and everyday Americans by keeping the lights on. That's why the best energy configuration for any customer--by far--is receiving service from the grid through traditional, regulated, retail electric service. This leverages Southern Company's robust infrastructure and planning capabilities that produce a holistically planned system that optimizes generation, transmission, and distribution. This conclusion is unassailable from a consideration of both physics and finance because grid service results in delivery of the most affordable, reliable power for all customers. It ensures an efficiently planned, engineered, and resilient system that result in optimal energy solutions for all customers— including large customers. However, in some energy markets outside of the Southeast where infrastructure investment is challenged, colocation projects, configured appropriately, may provide a short-term expedited path to gain access to generation and Southern Company stands ready to deploy appropriate infrastructure to meet the needs in these areas as well. Southern Company Gas, through its gas utilities can support, via fuel delivery, on-site generation for a hyper-scaler. Southern Power brings a wealth of experience designing, deploying and operating natural gas, solar, and battery resources while Power Secure stands ready to deploy turn-key microgrid and distributed energy solutions tailored for individual customer needs."

D) Is colocation alone the solution for meeting rising energy needs?

Response:

No. Integrated resource planning and investment from that planning is the solution to meeting rising energy needs. Colocation as a singular solution is simply not the way to economically and reliably design and engineer a power system for all customers over the long-term, as explained in the response to the prior question. However, in some energy markets outside of the Southeast where infrastructure investment is challenged, colocation projects, configured appropriately, may provide a short-term expedited path to gain access to generation. However, each project is unique and bears its own individual risk profile.

i. Do colocation arrangements support an interconnected grid? Why or why not?

Response:

As noted previously, each colocation project is unique and must be evaluated accordingly. However, generally speaking colocation agreements are not supportive of an interconnected grid, especially if the co-located assets are not connected to the grid (otherwise known as islanded). Colocation arrangements can stress the grid resulting in inefficient operation if they are not otherwise incorporated in holistic planning processes, creating costs for other customers. Rising energy needs require expedient investment into assets that benefit all customers through the interconnected grid; colocation as a singular solution can conflict with that proposition and can result in a focus on resources (supply chains, labor, etc.) solely to benefit certain customers, rather than an optimized system benefiting all customers.

Though colocation arrangements can present short-term alternatives for large customers, there are also challenges that should be considered for the benefit of the grid—and all customers—over the long-term. The notion of siting generation close to the customer, for the customer's use, makes intuitive sense—but the reality is more complex. Colocation drives two sets of costs towards other customers: (1) the costs of the customer with co-located generation from the continued reliance on the broader grid and the potential inefficient operation of the broader grid; and (2) when a customer is not included in the broader cost of service for all other customers, the other customers lose the rate benefit from bringing the new customer online. In this situation, most customers lose by paying costs that come from inefficient grid operation and losing the benefit of having the new large customer to share in the costs of the broader system.

This dynamic underscores the importance of an interconnected grid, with all customers planned for and served by a common set of generation, transmission, and distribution assets. If the risks to other customers are not accounted for, colocation can undermine the benefits of the grid, creating a clear winner in the form of the large customer rather than everyday customers who rely on utilities to provide safe and reliable service.

E) Please explain the value of firm transmission and the importance of firm transmission for reliability.

Response:
From a utility perspective, firm transmission is essential because it means that the utility is performing long-term transmission planning to ensure that the gird is capable of delivering generation to serve load. In the reliability context, what we mean by "firm" is that the system is planned, built, preserved, and operated to provide the highest level of certainty that the grid will be available when needed. Without this certainty that electricity can move across transmission lines, utilities cannot guarantee service to customers. There is a place for non-firm transmission – meaning the use of "headroom" on the system – but that is largely around the edges and unique to specific economic arrangements with customers. Firm transmission generally guarantees a delivery path for produced energy. Non-firm transmission service can result in interruptions to deliverability in the event of system congestion or if other factors are present in the operational environment. It follows that firm transmission better promotes overall reliability than non-firm transmission service. It also follows that systems that require firm transmission to be built along with affected system upgrades results is a more ubiquitous grid. A more ubiquitous grid provides better reliability, resilience, and flexibility.

F) Do PURPA qualified facility assets support an interconnected grid?

Response:
No. As an initial point of clarification, PURPA is a contractual arrangement with respect to the pricing of certain types of electric generation resources. Because such projects are structured as "must take" resources, the utility is not afforded the discretion of operating the resource in a manner that facilitates greater grid efficiency. Furthermore, because of the limited flexibility, the resource can at times act as a constraint on economic grid operations and dispatch. Ironically, decreased efficiency in electric operations is in direct contrast to one of primary goals of PURPA when first established.

PURPA, as a law, predates many of the integrated resource planning structures that exist today in certain states. Developed in response to specific set of conditions at the time of PURPAs inception, those conditions no longer exist as technologies have matured and domestic energy production has increased. Given the constraints of the PURPA pricing regime, utilities favor technologies identical to those often offered via PURPA, but under a non-PURPA arrangements as it is more beneficial to their customers.

In integrated resource planning, generation resources are procured based on a holistic evaluation that consider numerous facets of customer benefits. PURPA, on the other hand, forces procurement under a specific pricing model if the qualifying facility can meet certain requirements. The regime "tips the scales" and results in procurement without consideration of need or costs compared to alternatives. Integrated resource planning supports an interconnected grid by procuring resources and identifying infrastructure needs based on a broad evaluation and through comparing costs of different generation and infrastructure options. PURPA does neither, and by extension, qualifying facilities do not support an interconnected grid.

i. Do such assets result in lower energy costs for customers or greater reliability?

Response:
No. PURPA projects do not create lower costs for customers. PURPA was established in 1978, when renewable sources of generation were not widely available or used. PURPA created a framework that required utilities to buy from such projects at set contracted prices, in large part serving as an incentive to support expansion of the renewables industry. These set prices are based on the utility's avoided cost or an avoided cost proxy and approved by state regulators. To the extent that prices are approved that are higher than what the utility could build itself or could acquire in a non-PURPA arrangement, it costs customers more.

PURPA projects therefore result in neither lower energy costs for customers nor greater reliability. The "must-take" procurement structure of PURPA conflicts with the goals of integrated resource planning, where alternatives are evaluated based on cost-effectiveness and reliability benefits, among a host of other considerations.

G) What permitting changes are necessary to get additional energy infrastructure built?

Response:
Generation and transmission involve different issues with respect to permitting. As stationary sources, generation primarily involves local siting and licensing. Southern Company has sensible state regulators who approve the construction of new generation resources based on need. Transmission is where the bulk of permitting challenges exist. Streamlining federal, state, and local permitting and zoning requirements will greatly help facilitate the necessary expansion of the nation's transmission systems.

H) You mentioned AP1000 technology in your testimony. Please explain the importance of this technology as we look to meet rising energy demand.

Response:

The AP1000 is the only nuclear technology currently being considered for deployment that is licensed by the NRC and has been built. The AP1000 design is finished, tested, and operating at or above the level of the legacy US nuclear fleet. Further, the "design once, build many" model allows us to capitalize on learnings from one plant to another, building them faster and cheaper each time until we reach "nth of a kind" costs. Just as Vogtle Unit 4 cost 15-20% less than Vogtle Unit 3, our comprehensive learnings can be applied to improve both the cost and schedule performance of the next AP1000 unit. Additionally, given the magnitude of the electricity demand growth, it seems more appropriate to deploy large (1.1 GW each) reactors rather than smaller units.

i. **What will be necessary to get the next tranche of nuclear units developed?**

Response:

Clear, defined, and obtainable risk mitigation is needed to gain momentum and traction to start the buildout of new nuclear in this country. These risks, which fall into three categories, are largely outside of the owner's control and are both daunting and consequential enough to preclude sufficient momentum for new projects to gain traction. The federal government can and should play a role in helping mitigate risk in three ways:

1. Lowering the overall cost of nuclear development, which can be done through a combination of production and investment tax credits, DOE loan guarantees, and grants;

2. protecting the credit rating of the utility during construction, which can be done through the ability to transfer the investment tax credits during construction; and

3. defining a mechanism to share the cost of overruns caused by unpredictable events, ensuring existing utility customers are protected from the impacts of unlikely events. It is important to note that in a vertically integrated, state regulated market structure all of the benefits of this support would go to the benefit of the customer.

I) Please explain how large loads served by system assets can benefit all retail customers within the construct of an integrated utility regulated by a state public utilities commission or public service commission.

Response:

In a state-regulated, vertically integrated utility construct, pricing for large load customers is developed and approved by the state commission in a manner that produces benefits greater than the costs to serve each large load customer. The commission-approved rate tariffs, rules and regulations, and costing principles result in the addition of large load customers benefitting all customers. Further, adding customers and load to the system, especially large loads with high energy usage, results in fixed costs (such as storm recovery costs and bulk power system costs) being distributed over a larger customer base, resulting in lower costs for all customers.

In addition to these benefits, economic development provides significant benefits to state residents, including job creation, business retention, and investments that support the long-term success of a state's communities.

J) The report co-authored by Mr. Norris and referenced in hearing testimony notes that, "[o]ther considerations important for planning – such as ensuring adequate transmission capacity, ramping capability, and ramp-feasible reserves, among others – are beyond the scope of this study and therefore the results cannot be taken as an accurate estimate of the load that can be added to the system."

i. In utility system planning for an integrated utility regulated by a state public utilities commission or public service commission, are these types of considerations evaluated and planned for? If so, how?

Response:
Assessments of grid needs on the transmission and distribution level consider all of these factors in evaluating whether new investment is necessary. We undertake a multi-faceted approach to planning and investment with input from numerous subject matter experts, and state public service commissions then evaluate the investments to determine whether they are or were prudent.

Accordingly, we consider the elements that were out of the scope in the Nicholas Institute paper. The modeling a utility does for its planning exercises *must* consider real-world considerations and limitations. To use the examples in your question, a utility cannot conduct long-term planning exercises that allow more transmission capacity than is available on its system, nor can a utility ignore the ramping capability of each of its generators or overlook each kind of reserve (e.g., spinning reserves, non-spinning reserves) the utility is obligated to have to keep its system operating. These "out of scope" elements are essential to the basic functioning of a utility; they are not abstract thoughts that the utility can choose to overlook when planning how to best and most cost-effectively serve its customers into the future.

Mr. Norris excludes key factors for planning to reach a conclusion that minimal investment in the grid is necessary to meet rising energy needs. Integrated system planning relies on extensive modeling that goes out decades into the future to evaluate where investment is needed or where smaller upgrades or enhancements can satisfy needs for a sustained period of time. These analyses also consider how investments now can avoid or decrease costs in the future by creating new capacity or headroom in the grid. The report focuses instead on an investment avoidance strategy that does not consider needs that will arise as a result of the lack of investment int the future, and almost certainly at higher costs.