

Modernizing Southeast Grid Investments: How Enhanced Regional Transmission Planning Supports a Growing Economy

REPORT SUMMARY

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APRIL 2, 2025

PREPARED FOR

Carolinas Clean Energy Business Association
Clean Energy Buyers Association
Southern Renewable Energy Association

Funded by the Clean Grid Initiative,
a project of Multiplier



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- The authors would like to acknowledge the valuable contributions to this report provided by Johannes Pfeifenberger and John Tsoukalis (The Brattle Group), Gary Moody (Clean Grid Initiative), Simon Mahan (SREA), Katie Southworth (CEBA), Chris Carmody (CCEBA), Daniel Tait (Energy Alabama), and Jill Kysor (Energy Foundation). However, all results and any errors are the responsibility of the authors.
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Modernizing Southeast Grid Investments: How Enhanced Regional Transmission Planning Supports a Growing Economy

Across the Southeast, the electric power system is undergoing transformational change to serve the fast-growing economy and access cheaper and more diverse forms of energy. Utilities are projecting the highest growth in electricity demand in decades due to new manufacturing plants and data centers as well as the rising population. At the same time, the increasing severity and frequency of winter storms in the past several years have created new risks to keeping the lights on throughout the year. In order to transform the Southeast electricity grid to provide reliable and affordable power to all customers while meeting the challenges of tomorrow, the utilities in the Southeastern US must expand and modernize their transmission networks.

The transmission grid is central to effectively and reliably serving future demand. Transmission investments can lower overall system costs by maximizing the value of the other assets on the grid and efficiently connecting those assets to new and existing loads. However, the status quo approach for planning and building the future region-wide Southeast grid is insufficient for facing these challenges. Transmission development today is driven by utilities planning their systems in isolation, focusing primarily on their service areas (or in some cases the joint network within a state) instead of taking a broader, regional approach to grid expansion.

This approach is similar to each city designing its roads without coordinating with neighboring cities; if every city only built streets for its own residents without connecting to other cities' streets or the interstate highways, we'd see congestion, inefficiency, and lost economic opportunities. The same is true for the Southeast electrical grid. Utilities are developing significant transmission upgrades within their own footprint but are not effectively planning for jointly-developed regional projects to create a stronger, more connected Southeast transmission system that benefits everyone.

To meet the Southeast's future energy demands and ensure reliability while maintaining affordable electricity rates, utilities must think larger and embrace regional solutions that supplement utility-specific upgrades. Across the country, electric utilities are strengthening

their grids by investing billions of dollars in regional high-voltage power lines. These large-scale power lines allow utilities to tap into the most affordable electricity sources, share power more effectively during extreme weather, and build the capacity needed to sustain the region’s rapid economic growth.

In 2024, the Federal Energy Regulatory Commission (FERC), the federal agency responsible for overseeing interstate electricity transmission and wholesale electricity markets, issued Order No. 1920 to improve long-term regional transmission planning and cost allocation. This directive requires transmission planners across the country to proactively plan for long-term regional grid needs, considering a broader range of economic, reliability, and resilience benefits to ensure a cost-effective and reliable power system. In response to Order No. 1920, the Southeast Regional Transmission Planning (SERTP) organization has the opportunity in 2025 to implement a regional planning process that will modernize its transmission network.

Our high-level analysis of three regional transmission upgrades that increase capacity amongst Southeast utilities indicates that investing \$5 billion in the region’s grid can achieve over \$8 billion in savings and increase reliability. We explore the need for a better process to plan for these upgrades – and how to achieve it – in our full report, *Modernizing Southeast Grid Investments: How Enhanced Regional Transmission Planning Supports a Growing Economy*.

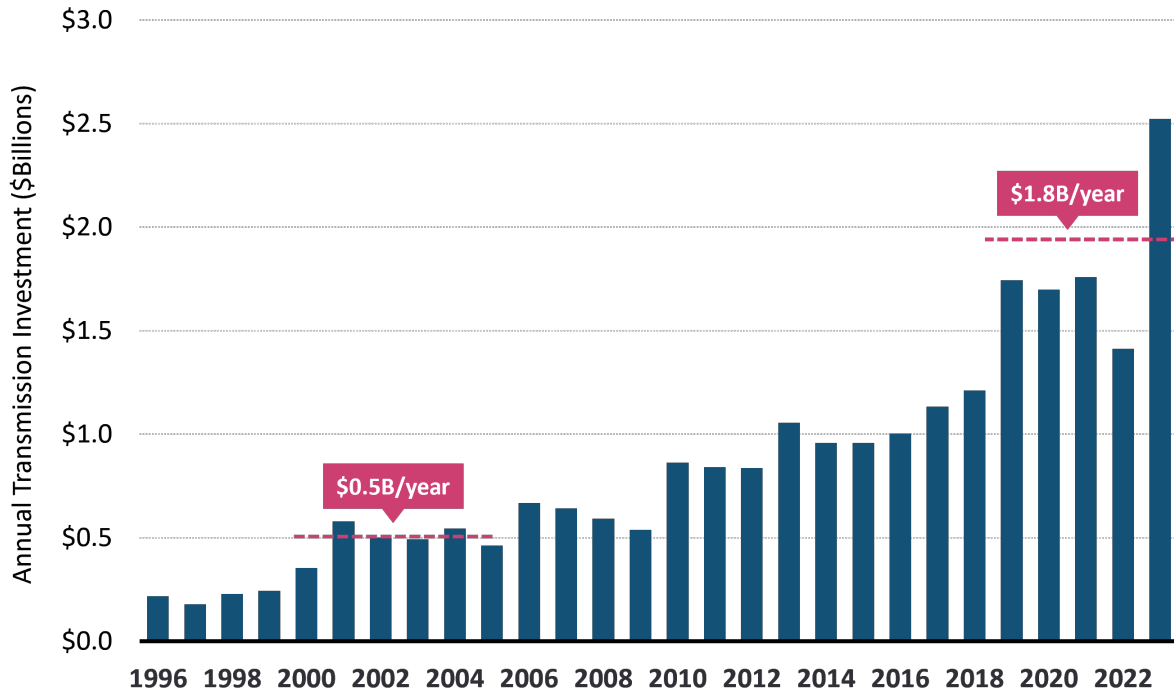
Key findings are outlined in this report summary. First, we summarize the key drivers of investment in the Southeast power system and the limitations of the current regional planning process. Then, we provide Southeast utilities, regulatory bodies, legislatures, and market participants with nine actionable steps for improving Southeast regional transmission planning, drawing on best practices developed across the industry over the past 20 years. The report concludes by demonstrating how large-scale, regional upgrades can reduce costs to customers across the Southeast.

I. The Southeast Must Invest in Regional Transmission to Cost-Effectively Meet Growing Demand and Maintain Reliability

The outlook for economic development in the Southeast, driven by new manufacturing plants and data centers, requires Southeast utilities to invest in tomorrow’s infrastructure efficiently. Notably, spending by three of the largest Southeast utilities on utility-specific local transmission upgrades has already quadrupled since the early 2000s, rising from \$500 million per year to

nearly \$2 billion per year in the past five years as shown in Figure 1 below. The increased spending has been driven by the need to replace aging infrastructure, connect new energy sources, and support moderate load growth.

FIGURE 1: ANNUAL TRANSMISSION INVESTMENT IN SERTP REGION (SOUTHERN COMPANY, DUKE ENERGY, LG&E/KU)



Source: The Brattle Group’s analysis of FERC Form 1 Data

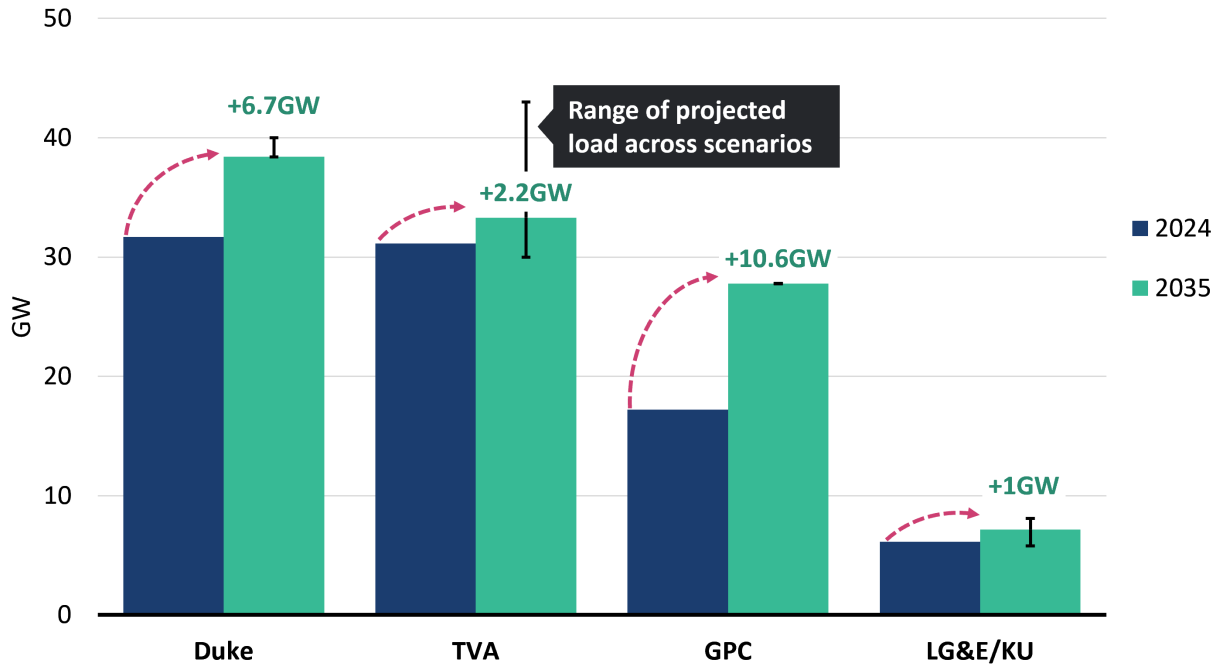
However, over the past decade, no regional transmission projects have been approved through the existing Southeast regional planning process. Without a regional, forward-looking strategy that maximizes the value of transmission investments, Southeast utilities risk inefficiently investing in lower-value local reliability projects within their respective systems, resulting in rising transmission rates without achieving the greatest return on their transmission investments. Instead of maintaining existing systems, utilities should prioritize regional upgrades that supplement necessary local reliability upgrades and support a reliable grid, new energy generation, and long-term load growth.

Looking forward, the future needs of the power system are changing quickly, and the challenges facing the electrical grid are only expected to accelerate:

- By 2035, electricity demand in the Southeast is expected to grow by 21 gigawatts (GW), as shown in Figure 2 – a 25% increase over today; this is similar to adding twice the power

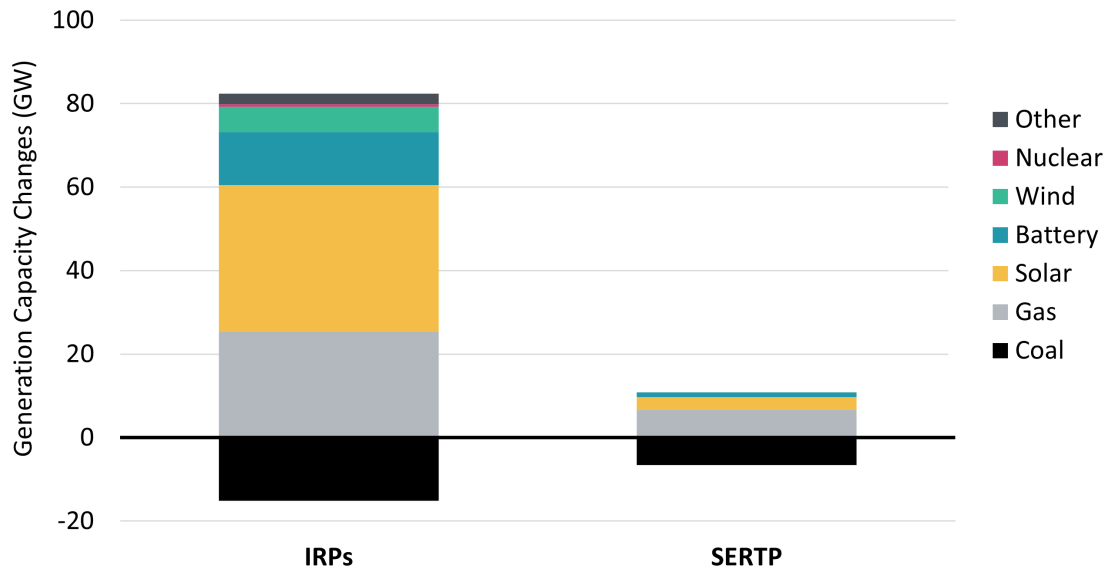
demand of New York City in the next 10 years. To keep the lights on and costs down, the Southeast needs to plan ahead to build out a modern, well-connected transmission system.

FIGURE 2: PROJECTED LOAD GROWTH BY 2035



- Based on the utilities' own resource planning studies, the Southeast will need at least 80 GW of new power generation by 2035 to keep up with growing demand and replace aging coal plants, as shown in Figure 3 below. To put that into perspective, the recently completed Vogtle Units 3 and 4 added 3 GW. Without a stronger transmission network, these new power sources could face costly delays – driving up energy prices and slowing economic growth. Planning ahead ensures the Southeast grid can deliver affordable, reliable power where it's needed most to new and existing customers.

FIGURE 3: GENERATION CHANGES BY 2035 IN UTILITY INTEGRATED RESOURCE PLAN STUDIES AND SERTP REGIONAL PLANNING STUDY (TVA, GEORGIA POWER, DUKE ENERGY, LG&E/KU)



- Severe weather is putting more strain on the power grid than ever before. Recent winter storms like Elliott and Uri led to challenges operating power plants and widespread outages, leaving millions without power when they needed it most. At the same time, summer heat waves are pushing the system to its limit, driving up electricity demand and increasing the risk of blackouts. A stronger, more connected regional grid would help keep the lights on during extreme weather by providing access to a more diverse set of resources that can reliably and cost-effectively warm homes in a deep freeze or keep the AC running during a heatwave.

Regional transmission can unlock savings in operating the power system well in excess of the costs of building new transmission, resulting in lower total costs of serving customers, lower risks of outages during extreme storms, and available capacity to efficiently add generation.

Transmission planners across the US are identifying major investments in high-voltage, regional transmission to meet future needs. In the past three years, the Midcontinent Independent System Operator (MISO) – which covers territory from Louisiana to Minnesota – approved \$33 billion of transmission projects in the northern portion of its system that will reduce net system costs by \$50–125 billion over the life of the assets. Similar major regional transmission upgrades have been recently pursued across every region in the US except for the Southeast, some of which are in the full report.

The Southeast is not different in the need for investment in its regional transmission system; several national studies by the North American Electricity Reliability Corporation (NERC), the U.S. Department of Energy, and the National Renewable Energy Laboratory (NREL) have identified high-voltage upgrades across the Southeast that will save its customers money and boost reliability. Yet, all recent Southeast transmission upgrades are based solely on transmission planning completed separately by each utility or smaller groups of utilities – such as the Carolinas Transmission Planning Collaborative and the Georgia Integrated Transmission System – that do not consider savings or reliability and resilience benefits of supplementing utility-specific upgrades with larger, more cost-effective regional and interregional projects that benefit all customers.

II. SERTP Regional Transmission Planning Process is Insufficient to Meet Future System Needs

Established in 2007 in response to FERC orders aimed at improving regional coordination in transmission planning, SERTP has provided a forum for its 10 sponsor utilities across 12 states to collaborate on regional transmission planning and cost allocation and will be adding utilities from South Carolina in the coming year, but it has no independent staff beyond the utility sponsors. SERTP’s current regional planning process is insufficient to meet the modern needs of the Southeast electricity system.

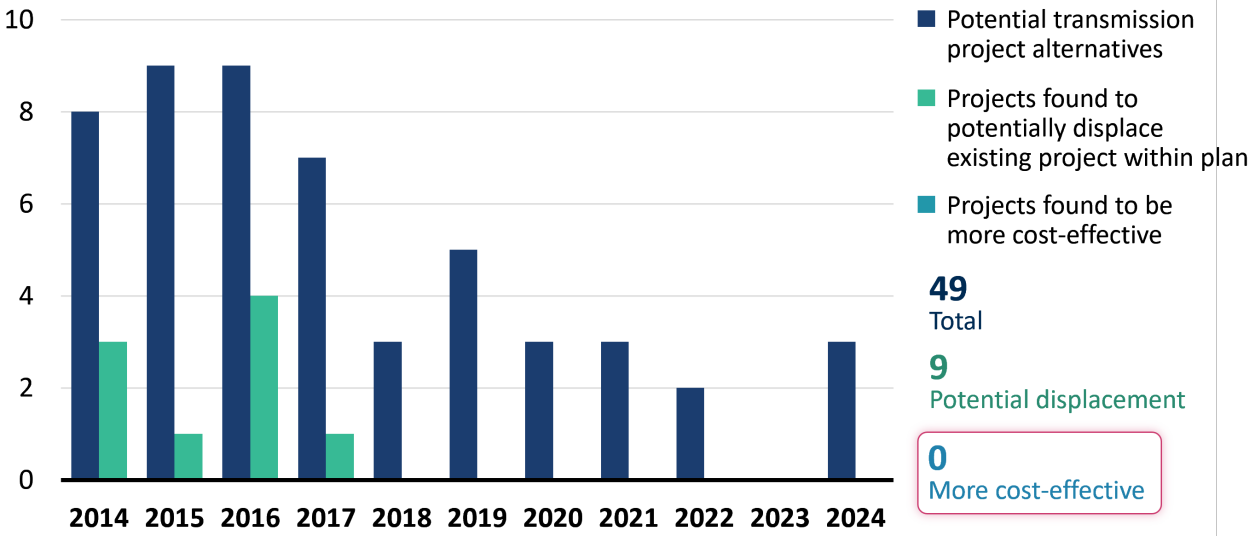
Currently, the SERTP planning process primarily aggregates utility-specific plans and assesses whether the utilities meet a narrow scope of needs under a single set of future market conditions. This process does not capture the broader cost savings, reliability benefits, and resilience improvements that regional transmission upgrades could provide, missing opportunities to lower costs, improve reliability, and strengthen resilience across the region. Nor does it evaluate needs across a range of potential future scenarios. This approach leaves the Southeast vulnerable to higher costs, power shortages, and unnecessary risks.

Several particular limitations in SERTP’s planning process make it difficult to identify and approve cost-effective regional transmission upgrades:

- **Limited Scope of Long-Term Planning:** Although Southeast utilities consider multiple future scenarios in their individual resource planning studies, such as faster-than-expected growth, changing energy sources, or more extreme weather, SERTP uses one future scenario when planning for the region. In addition, SERTP uses a single benefit metric – avoided local transmission project costs – to calculate transmission benefits.

- The Grid Isn't Planned for Utility-Identified Generation Needs:** Utilities have identified the need for over 80 GW of new power generation, but the regional plan only accounts for 12% of that growth. This mismatch could lead to a system that is ill-prepared for the coming changes and result in bottlenecks on the grid and delays in bringing new power online.
- Lack of Transparency:** SERTP provides limited information to review throughout the planning process, giving the impression that key decisions for the future Southeast grid are made behind closed doors. Stakeholders have limited opportunities to provide input into the development of a least-cost regional transmission plan. The information SERTP releases publicly is much less than provided by other planning entities across the country, including the latest regional models, scenarios evaluated, generation resources included, identified needs and alternative solutions analyzed, and the costs of utility-specific and regional transmission solutions. Without more transparency, customers could end up paying higher bills because better, more affordable solutions were not shared or fully considered.
- No Regional Projects Approved:** Unlike other planning areas in the country, no regional transmission project has been approved through the SERTP process in over a decade, as shown in Figure 4, even as demand rises and extreme weather puts more pressure on the grid. This leaves utilities building upgrades only within their footprint rather than investing in larger, more cost-effective solutions that could improve reliability and lower costs.

FIGURE 4: TRANSMISSION PROJECT ALTERNATIVES EVALUATED BY SERTP



The current SERTP regional planning process will not yield the most valuable and cost-effective transmission infrastructure needed to meet the future needs of the system.

Recognizing limitations in existing planning processes in the Southeast and across the country, FERC issued Order No. 1920 to modernize regional transmission planning nationwide. The new framework requires long-term, scenario-based planning that accounts for growing electricity demand, cost-effective generation integration, system resilience against extreme weather, and evaluation of a broad range of regional transmission benefits. These benefits include:

1. Avoided or deferred reliability transmission facilities and aging infrastructure replacement
2. Reduced loss of load probability or reduced planning reserve margin
3. Production cost savings
4. Reduced transmission energy losses
5. Reduced congestion due to transmission outages
6. Mitigation of extreme weather events and unexpected system conditions
7. Capacity cost benefits from reduced peak energy losses

Order 1920 presents a critical opportunity for the Southeast to enhance coordination, optimize investments, and ensure cost-effective solutions that benefit both utilities and customers. Without reform, the Southeast grid risks falling behind, leaving customers to bear the costs and risks of insufficient investment in the regional power system. The Southeast should implement a forward-thinking approach to transmission planning – one that looks ahead, encourages coordination across state lines, and ensures smart investments that keep electricity reliable and affordable for everyone.

By embracing best practices in regional planning, presented in the next section, the Southeast can build a modern transmission system that keeps electricity affordable, reliable, and resilient – positioning utilities and customers for long-term success.

III. Recommendations to Enhance SERTP Regional Transmission Planning

SERTP has an opportunity in 2025 to implement an enhanced regional transmission planning process that meets and potentially exceeds the requirements of Order No. 1920 by leveraging experience gained across the industry over the past 20 years. That experience highlights proven planning practices that can reduce total system costs and risks:

- **Proactively and holistically plan for future generation and load** by incorporating realistic projections of all needs: anticipated generation and load levels over the life of the transmission investments; critical to avoid siloed, incremental planning processes.
- **Account for the full range of transmission needs and use multi-value planning** to comprehensively identify investments that cost-effectively address all needs and benefits.
- **Address uncertainties and high-stress grid conditions explicitly through scenario-based planning** that accounts for all transmission needs for a broad range of plausible long-term futures as well as real-world system conditions, including challenging weather events.
- **Use comprehensive transmission network portfolios to address system needs and cost allocation** more efficiently and less contentiously than a project-by-project approach.
- **Jointly plan interregional projects across neighboring systems** to recognize regional interdependence, increase system resilience, and take full advantage of scale economics and geographic diversification.

Specifically, we recommend that SERTP implement the following nine changes to its regional planning process to reduce long-term system costs and risks. Broadly, they fall under three key themes: improving the existing planning process, expanding SERTP planning capabilities, and implementing a comprehensive and proactive regional planning process.

I. IMPROVE THE EXISTING PLANNING PROCESS

1. **Improve Transparency:** Increase transparency in SERTP’s regional planning process, including input assumptions, study results, and project costs.
2. **Support Active State Role:** Engage state commissions and policymakers to actively participate in the annual planning process and ensure the SERTP planning decisions align with their goals of achieving customer cost reductions and state energy policies.
3. **Fully Utilize Existing System:** Expand the scope of transmission solutions studied for meeting future system needs based on a least-cost transmission “loading order” approach that:
 - Maximizes the use of existing transmission infrastructure
 - Upgrades existing lines before building new lines where possible
 - Ensures cost-effective regional solutions are proactively planned and built ahead of the need to benefit ratepayers

II. EXPAND SERTP PLANNING CAPABILITIES

4. **Study Multiple Future Scenarios:** Develop multiple future scenarios to prepare for load growth and changing generation resources. These scenarios should leverage the range of future outlooks for electricity demand and power plants already completed by utilities through their resource planning studies.
5. **Accurately Model Congestion:** Accurately identify congestion on the future regional system by developing a region-wide production cost model to quantify transmission cost savings across the system during both normal operating conditions and frequently occurring summer and winter weather events.
6. **Develop Benefits Analysis Guidelines:** For analyzing regional upgrades, develop guidelines for estimating a comprehensive set of cost savings and other benefits that consider the value of investing in a modern grid rather than a narrow focus solely on minimizing transmission costs.

III. IMPLEMENT A COMPREHENSIVE AND PROACTIVE REGIONAL PLANNING PROCESS

7. **Implement Multi-Driver Needs Analysis:** Establish a multi-driver approach to identify both regional and interregional transmission needs and candidate transmission solutions that meet the reliability, economic, and policy needs of the regional system.
8. **Estimate Benefits Over Full Asset Life:** Estimate long-term benefits and cost savings of a portfolio of regional transmission upgrades over the full asset lifespan rather than focusing on short-term reliability fixes.
9. **Develop Fair Cost Allocation:** Develop a cost allocation model for regional projects such that:
 - Those who benefit the most from upgrades will contribute the most to the costs;
 - The “beneficiary pays” principle is applied, avoiding undue burdens on any single utility or ratepayer group.

Additional details on each of these recommendations are provided in the full report.

These common-sense, market-driven reforms will ensure that the Southeast's transmission system is better prepared for future energy needs while keeping costs low, reliability high, and regulatory burdens minimal. By improving transparency, expanding planning capabilities, and adopting a proactive regional strategy, SERTP can build a stronger, more efficient grid that supports economic growth, energy affordability, and long-term resilience.

IV. Why the Southeast Needs to Modernize Its Planning Process Now to Reduce Costs and Increase Reliability

As previously noted, the Southeast is the only major US region that has not pursued significant regional transmission projects over the past decade. Every other region has taken proactive steps to lower electricity costs, improve reliability, and support economic growth by installing major regional transmission projects. Without similar action, the Southeast risks falling further behind.

Other regions' experiences make it clear that systems that invest in regional transmission reduce costs and improve reliability. Examples include:

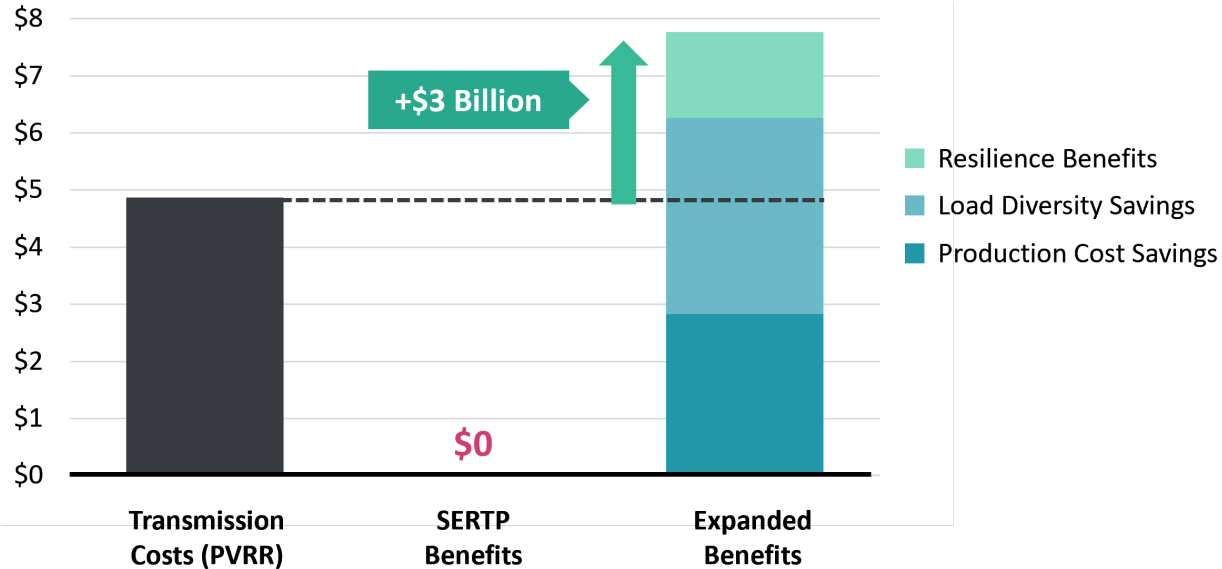
- **Midcontinent Independent System Operator (MISO) Long-Range Transmission Planning (LRTP):** MISO implemented a long-term, scenario-based regional planning process, approving major grid upgrades that cut costs, improved reliability, and ensured energy availability during extreme weather. To date, the first two tranches of the Long-Range Transmission Planning process have resulted in \$33 billion of investment that will yield \$50–125 billion in cost savings over the life of the assets. MISO South is in the early phases of implementing its own regional planning process to identify cost-effective upgrades.
- **Electric Reliability Council of Texas (ERCOT) System-wide Load Growth Study in Texas:** Facing significant growth in electricity demand, the Texas legislature required ERCOT to study extra-high voltage upgrades to cost-effectively serve both future and existing customers. The system-wide study released in January 2025 proposes to build \$31–33 billion in upgrades from West Texas to Houston, including 2,468 miles of new high-voltage lines.
- **PJM Interconnection \$6 Billion Grid Expansion to Serve Data Center Load:** The regional grid operator serving 65 million people identified the need for \$6 billion of regional transmission investment from Ohio to Virginia to prevent blackouts, lower costs, and support business growth.

- Carolinas Transmission Planning Collaborative (CTPC) Multi-Value Strategic Transmission Study:** Within the Southeast, the CTPC, including Duke Energy, has implemented a proactive, scenario-based planning process to identify Multi-Value Strategic Transmission upgrades for its service territories in South Carolina and North Carolina. This process is currently underway for the first time, providing a blueprint that can be scaled up to the regional Southeast planning process.

The same system needs that led MISO, Duke Energy, ERCOT, PJM, and other planners across the country to embrace proactive regional planning also applies to the Southeast and SERTP. The region has an opportunity in 2025 to reform its transmission planning approach and avoid rising costs, reliability risks, and delays in supporting the current rates of economic growth.

A high-level benefits analysis of three 500 kV transmission upgrades identified in SERTP’s 2024 process indicates that regional projects can deliver significant cost savings, as shown in Figure 5.

FIGURE 5: ESTIMATED NET BENEFITS OF SERTP REGIONAL PROJECTS



By investing \$5 billion in future transmission costs, the Southeast can achieve at least \$8 billion in savings, including:

- Lowering operational costs by accessing the cheapest available energy sources could result in **\$2.9 billion in production cost savings** (range: \$2.0–3.6 billion)
- Reducing peak energy demand costs by sharing power across states could amount to **\$3.3 billion in load diversity savings** (range: \$0.9–6.0 billion)

- Strengthening the grid against extreme weather and unexpected disruptions could lead to **\$1.6 billion in resilience benefits** (range: \$0.7–2.3 billion)

Cost savings for these major 500 kV projects are likely to be significantly higher than captured due to several factors that were beyond the scope of the analysis in this report, including lower interconnection costs, reduced generation capital costs, and greater efficiencies from a more connected grid.

By contrast, SERTP evaluated the same set of projects based on an overly narrow view of cost savings and identified zero benefits of the three major upgrades that increase transfers between Duke Energy, Southern Company, and the Tennessee Valley Authority (TVA), missing billions in potential benefits for customers and businesses across the Southeast.

V. Conclusion: There Is a Clear Need to Modernize SERTP Regional Transmission Planning

In summary, every year without a proactive regional transmission planning process in the Southeast results in higher electricity bills, increased blackout risks, and lost business investment over the long term. FERC Order 1920 presents a pivotal opportunity to align the Southeast's planning process with industry best practices, ensuring a stronger, more resilient, and more cost-effective grid. The Southeast must embrace this opportunity in 2025 to modernize SERTP's regional transmission planning to build a stronger, more efficient grid that supports economic growth, energy affordability, and long-term resilience.