



Eastern Interconnection Planning Collaborative

EIPC STATE OF THE GRID REPORT – 2021

A description of Eastern Interconnection Planning Collaborative activities and summary of results from studies and analyses on the collective transmission plans in the Eastern Interconnection.

December 2021



Eastern Interconnection Planning Collaborative

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About EIPC

The Eastern Interconnection Planning Collaborative (EIPC) represents a first-of-its-kind collaboration among the Eastern Interconnection transmission planners working together on an interconnection-wide basis to ensure a reliable electric transmission grid for a region covering over two-thirds of the United States and Canada.

The Eastern Interconnection consists of the interconnected transmission grids of bulk electric systems in a region stretching from New England to Florida and to the Rocky Mountains.¹ The interconnected systems operate as one large synchronous machine ensuring the efficient and reliable delivery of electricity to over 240 million Americans and Canadians.

EIPC's mission statement underscores its collaborative mission:

“EIPC provides a forum for interconnection-wide coordination of system planning activities of its member regions in the Eastern Interconnection while also providing policymakers and regulators with relevant, complete and technically sound information.”

Executive Summary

This document is the second State of the Grid Report developed by EIPC. The transmission planners who make up the EIPC are pleased to report that the Eastern Interconnection remains strong, and that their individual and collective transmission planning activities have yielded a system that is reliable and well-coordinated on both a regional and interconnection-wide basis.

Nevertheless, looking forward, the grid is being challenged in new ways as the profile of the generation fleet and customer demands are rapidly changing. Continued vigilance and effective use of planning tools and coordination with policymakers are essential to ensure that today's strong and reliable grid remains so in the future in order to meet the needs of the 240 million Americans and Canadians who depend on it for everyday life.

The planners of the EIPC have tested the resiliency of the grid through a variety of planning

¹ The electricity grids in the United States and Canada are made up of four interconnections – the Eastern Interconnection, the Western Interconnection, the Texas Interconnection and the Quebec Interconnection.

evaluations that are outlined in this report. These include:

- The 2028 roll-up analysis, ensuring that the individual transmission plans of each region reinforce reliability and are working in harmony with one another
- An interconnection-wide gap analysis, as part of the 2028 roll-up analysis, utilizing power-flow evaluations under different scenarios between regions
- A linear transfer analysis, as part of the 2028 roll-up analysis, analyzing the transfer capability across regions so that the industry's standard of ensuring mutual support in the event of emergencies can be maintained
- A system inertia study utilizing dynamic modeling tools to ensure that the all-important frequency response of the Eastern Interconnection continues to ensure a reliable and resilient system

Each of these analyses are explained in this report and serve as the building blocks for EIPC's overall determination that the state of the grid is strong.

This report also analyzes EIPC's ongoing work in gas/electric coordination, modeling coordination, and support for state and federal policymakers. These activities are essential to ensuring that the grid of the future remains reliable and resilient, and continue the collaboration that has characterized EIPC since its formation.

EIPC is pleased to provide this report as a resource for both stakeholders and policymakers throughout the interconnection. We at EIPC look forward to continuing to work with stakeholders to ensure effective planning for a reliable and resilient grid for years to come.

Introduction

This report is the second State of the Grid Report issued by EIPC.² Given the size of the Eastern Interconnection (representing approximately two-thirds of the United States and Canada) and the significant geographic and power generation diversity within the Interconnection, the collaboration among the Planning Coordinators through this effort marks a significant milestone in the long history of industry collaboration and coordination.

² The first EIPC "State of the Grid" report was issued on Oct. 3, 2018, and can be accessed at [EIPC-State-of-the-Eastern-Interconnection+10-3-18.pdf \(squareospace.com\)](https://www.eipc.org/State-of-the-Eastern-Interconnection+10-3-18.pdf).

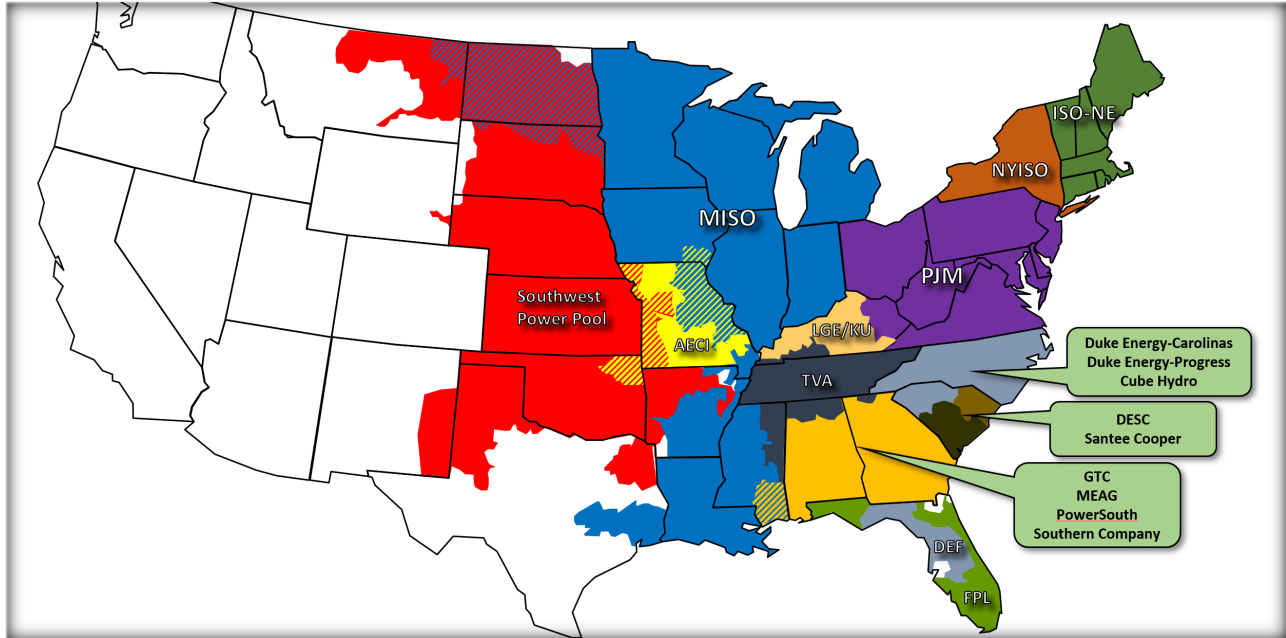


EIPC Membership

The Eastern Interconnection is divided into planning regions that consist of multiple individual utilities that coordinate their planning and reliability responsibilities through FERC-recognized planning regions. As shown in Figure 1 below the EIPC member systems' planning regions include:

- Associated Electric Cooperative
- Cube Hydro Carolinas
- Duke Energy Carolinas
- Duke Energy Florida
- Duke Energy Progress
- Florida Power & Light Company
- Georgia Transmission Corporation (An Electric Membership Corporation)
- ISO New England (ISO-NE)
- Louisville Gas and Electric Company and Kentucky Utilities Company
- Midcontinent Independent Transmission System Operator (MISO)
- Municipal Electric Authority of Georgia
- New York Independent System Operator (NYISO)
- PJM Interconnection.
- PowerSouth Energy Cooperative
- South Carolina Electric & Gas Company
- South Carolina Public Service Authority (Santee Cooper)
- Southern Company Services, as agent for Alabama Power Company, Georgia Power Company, and Mississippi Power Company
- Southwest Power Pool (SPP)
- The Tennessee Valley Authority

Figure 1. Figure 1. EIPC Member Transmission Planning Regions



Purpose

This report is intended to serve as an informational tool for policymakers and regulators. It provides objective information from those directly charged with the responsibility to plan a reliable transmission grid in the Eastern Interconnection. It addresses the present and future state of transmission planning for bulk power grid reliability and the interregional coordination of those efforts.³ Thus the report provides a firm, factual basis that policymakers and regulators can use when considering questions such as:

- Is the bulk power grid in the Eastern Interconnection being planned in a manner that adequately addresses bulk power reliability on a broad, interconnection-wide basis?
- Do Planning Coordinators in the Eastern Interconnection collaborate to identify appropriate synergies and opportunities for more efficient or cost-effective interregional solutions?
- What EIPC activities and capabilities can be used to inform policymakers, regulators and other stakeholders regarding the present and future state of the bulk power grid serving the Eastern Interconnection?

Key Findings

The Eastern Interconnection operates as a single large synchronous machine, and coordination among its individual regional transmission planners is essential to maintaining and enhancing the interconnection's overall reliability and resilience.

The EIPC reports that the Eastern Interconnection remains strong, and that the transmission planning activities have yielded a system that is reliable and well-coordinated on a regional and interconnection-wide basis.

³ EIPC analysis coordinates the local and regional compliance analyses of the individual Order 1000 Planning Coordinator regions. This report complements, but does not substitute for, those individual assessments of reliability. Because the Planning Coordinators are the entities actually responsible for developing plans for their respective regions, by definition, the information utilized in the EIPC analyses is more granular than that which NERC employs to conduct its annual and seasonal assessments. Accordingly, this report also complements, but is not a substitute for, regular NERC assessments published pursuant to Section 215 of the Federal Power Act and NERC's overall reliability assessment responsibilities.

This is a result of individual Planning Coordinator efforts combined with the cooperation among Planning Coordinators through:

- a. Their respective planning regions
- b. Interregional Coordination
- c. Interconnection-wide EIPC coordination

Going forward, continued vigilance and effective use of planning evaluations both today and in the future are essential to ensure that individual regional transmission plans and the impact of generator retirements and additions complement, rather than conflict with, the regional plans of neighboring Planning Coordinators.

EIPC Assessments, Results and Current Initiatives

A. Introduction

EIPC provides a forum to complement interregional coordination of the combined plans of the regional Planning Coordinators. The work undertaken at EIPC evaluates how well the regional plans mesh into a combined plan for the interconnection.

Assessments and current initiatives described in this document are:

- 2028 summer and winter roll-up integration case analyses
- Production costing/chronological simulation database development
- 2020 frequency response analysis
- Electric-gas coordination
- Modeling coordination

B. 2028 Roll-Up Analyses Description

The EIPC's Transmission Analysis Working Group produces Eastern Interconnection roll-up integration cases, most recently for 2028 summer (2028S) and 2028 winter (2028W).

The roll-up integration cases represent the “base cases” for the Eastern Interconnection that are suitable as starting points for additional transfer analysis and analysis of scenarios developed by industry stakeholders. The cases are integrated models of the individual Planning

Coordinator’s plans for the Eastern Interconnection as they existed in January 2019.⁴

The 2028 summer and 2028 winter roll-up integration cases represent the power system for a particular “snapshot” in time (2028S and 2028W peak hours). A 10-year-forward forecast is utilized because that is the typical horizon utilized by EIPC member regions for their regional planning. EIPC used existing transmission plans provided by each Planning Coordinator as the source of data for model development.

Each participating Planning Coordinator’s individual system plans were informed by the FERC-approved regional transmission planning processes for each of the participating EIPC members (as applicable).⁵ Loads, as well as generation and demand-side resources, are inputs into the transmission expansion plans that each Planning Coordinator develops and were provided by the respective Load Serving Entities (LSEs), market participants or other applicable entities within each Planning Coordinator’s jurisdiction.

a. Interregional Transmission (Gap) Analysis

Analysis Description

As part of the roll-up analysis, EIPC undertook an interregional transmission gap analysis to identify interconnection-wide power flow interactions that may result from the effects of plans of one Planning Coordinator on another.

Conclusion

The analysis indicates that the regional plans will work well together, and there were very few gaps. As is typical of such studies, the analysis did identify a limited number of overloaded facilities, which are described in the detailed report together with conceptual solutions, including upgrading facility capacities, adding new circuits, following operating procedures and/or redispatching generation.

This interconnection-wide analysis provides valuable information to member system planners for the development of final solutions through their respective regional transmission

⁴ A non-CEII version of the report documenting this 2028 assessment is available to the public at https://static1.squarespace.com/static/5b1032e545776e01e7058845/t/5d7bcc99ab124176b6f8ce17/1568394394545/EIPC_Roll-Up_Report_2019_public_Final.pdf.

⁵ Certain EIPC members are not regulated by FERC and therefore are not subject to the FERC’s Order 890 and Order 1000 planning requirements.

planning.

b. Linear Transfer Analysis Description

EIPC's linear transfer analysis is designed to analyze the amount of power that can be reliably moved between regions. This illustrates the transfer capabilities of the transmission grid as currently planned under different transfer scenarios among regions (based on the 2028S and 2028W roll-up cases).

Conclusion

Again, the results of this analysis were very positive and verify that on an interconnection-wide basis, there is additional headroom in the system that can support a level of increased interregional transfers. This headroom, as a result of the existence of a strong interconnection, was dramatically illustrated during the winter of 2021, when during the winter cold spell in February, a record level of exports were provided from the PJM region to support the MISO and SPP systems.

Although the additional transfer capability highlighted in the report supports the conclusion that the interconnection remains strong, this finding should not be read as concluding that strengthening interregional capability between specific regions within the Interconnection is not justified. The Transmission Analysis Working Group's detailed 2028 assessment report and its appendices contain more information on all transfer analyses.

Overall Roll-Up Report Conclusion

This report provides a current update of the extensive work completed by EIPC since its inception in 2009 to produce roll-up reports that combine the individual plans of each of the major Planning Coordinators in the Eastern Interconnection. Focusing on the horizon year of 2028, the most recent roll-up report demonstrates that the transmission system is being planned to preserve the reliability of the Eastern Interconnection. These roll-up studies provide solved power flow models suitable for use in additional interconnection-wide transmission analyses. In this way, the roll-up report serves as a resource for policymakers, regulators and other stakeholders to analyze various future scenarios of interest.

C. Production Costing/ Database Development

Description

EIPC has been working to develop a reliable model for use in undertaking interconnection-wide production cost modeling. Production cost modeling is based on the physical topography of the bulk electric system as represented in power flow models, but it also simulates the operation

and dispatch of the system on an hourly basis rather than at a single point in time (e.g., the peak hour). In this way, it can identify the times of critical constraints on the transmission system for more detailed analysis in further power flow studies. In addition, production cost models provide additional information such as production cost, congestion cost, fuel usage and emissions for analysis by system planners.

A challenge in developing these models comes from the need for consistency between production cost-modeling datasets (which focus more on markets and economics than grid stability) and power-flow model datasets. The National Renewable Energy Laboratory (NREL) has created a comprehensive production cost database of the Eastern Interconnection for EIPC and has leveraged its existing model to merge with the EIPC power flow base case model to create a consistent production cost model for EIPC.

Conclusions to Date

The NREL worked with EIPC to develop a comprehensive database of the generating fleet for the production cost model. Key elements of the database include:

- Economic parameters (such as heat rate, operations and maintenance, startup and fuel costs)
- Performance parameters (such as ramp rates, startup times, and minimum up and down times)
- Energy limits (for hydro generators)
- Production profiles for wind and solar generators

EIPC members reviewed the NREL database and provided updates to the data from their regions to produce an Eastern Interconnection-wide database for use in future studies by EIPC and its members.

D. 2020 Frequency Response Analysis Description

The Frequency Response Working Group 2020 Report⁶ details the technical analyses, model modifications and simulations performed by the EIPC Frequency Response Working Group to assess the North American Electric Reliability Corporation (NERC) Essential Reliability Services Working Group forward-looking frequency Measures 1, 2 and 4⁷ for the Eastern

⁶ [EIPC FRWG 2020 Report \(squarespace.com\)](#)

⁷ [Report \(nerc.com\)](#)

Interconnection for inclusion in a future NERC Long-Term Reliability Assessment.

Report Conclusion

The analysis and simulation of this study demonstrated that the Eastern Interconnection should have sufficient system inertia over the next five years with the expected generation resource mix, load, interchange levels and governor participation. However, with the additional non-synchronous generation and increased resource retirements, maintaining frequency in the Eastern Interconnection is a concern that warrants continued study.

Following discussion with the NERC Essential Reliability Services Working Group, EIPC accepted the task of identifying and understanding how future generation contingencies could lead to under-frequency load shedding events in the Eastern Interconnection due to the reduction of frequency support from the changing generation resource mix.

EIPC benchmarked historical frequency events with spring light load cases to determine how the existing generator control models respond to the frequency events. A list of recommended changes to improve the frequency responsiveness of the planning models for use by the Eastern Interconnection Reliability Assessment Group (ERAG) Multiregional Modeling Working Group (MMWG) in future model development cycles was created.

As in a similar study performed in 2018, two different frequency events and the most severe single contingency for the Eastern Interconnection were tested. The results of this analysis were provided to NERC for inclusion in the 2021 NERC Long-Term Reliability Assessment. Additionally, EIPC has worked with the MMWG to define a minimum load future-year case for inclusion in the upcoming library cases. This case will facilitate the development of the models required for the periodic EIPC studies under low system inertia conditions requested by NERC.

The 2020 Report contained the following recommendations to improve the Eastern Interconnection dynamic models developed annually by the MMWG for use by system planners, governmental agencies, policymakers and other stakeholders for analysis of the Eastern Interconnection:

- Emphasize to model data submitters the importance of using gross megawatt generator capability and inclusion of station auxiliary load in the case models
- Emphasize the importance of appropriate selection and coordination of the frequency and turbine-governor-related model parameters
- Consider the benefits of including load-frequency response characteristic models as

part of the annual MMWG Dynamics Update process

The EIPC will continue to work with industry groups to implement these recommendations.

Further details regarding the analyses and results are available in the Frequency Response Working Group 2020 Final Report.

E. Electric-Gas Coordination Description

EIPC and its members have been involved in the analysis of electric-gas reliability since its landmark Gas Electric System Interface Study under a grant from the Department of Energy (DOE) in 2013–2014. EIPC also established its own Electric-Gas Task Force in 2019 to assess both planning and operational procedures related to the impact of gas supply disruptions on the reliability of the electric system.

The Electric-Gas Task Force has undertaken three tasks focused on improving the reliability of the Eastern Interconnection through coordination with the interstate natural gas pipelines that serve as a fuel source to a large amount of generation throughout the interconnection:

1. Review of planning procedures and criteria for assessment of gas supply disruptions
2. Review of practices for extreme event testing under NERC Standard TPL-001
3. Review of electric-gas operational coordination procedures during pipeline disruptions

Description of Activities to Date

Activities to date include the following:

- Updated the previously developed 2018 survey regarding members' electric-gas initiatives to provide a baseline for further study
- Held a workshop in April 2020 for members to review their respective organizations' studies and analyses regarding electric-gas interdependency
- Collaborated with Argonne National Labs to gain a better understanding of its past and present work on gas-electric coordination, to support its ongoing gas and electric modeling work, and to discuss opportunities for potential engagement of Argonne in future EIPC studies
- Reviewed NERC's Fuel Assurance Guideline developed by the NERC Electric Gas Working Group and identified any correlations of those guidelines with member

systems' existing regional fuel-assurance processes and procedures

- Reviewed and provided comments on the NERC Energy Security White Paper, which NERC released in 2020 for approval by the NERC Reliability and Security Technical Committee. (The comments questioned the immediate need for a reliability standard, with an expressed preference to first gain experience employing the Fuel Assurance Guideline approved in 2020. The EIPC will continue to monitor this effort.)

F. Modeling Coordination Description

In the fall of 2020, EIPC created the Model Coordination Working Group to:

- Work with the MMWG and the ERAG to identify initiatives to improve the quality of the planning models as well as the effectiveness and efficiency of the MMWG model building process for the Eastern Interconnection
- Facilitate information exchange between EIPC and the MMWG/ERAG (to determine if a specific case need can be addressed by temporary modification of assumptions in an existing case, or if an existing case can be temporarily or permanently replaced)

EIPC formed the Modeling Coordination Working Group because the series of power flow and dynamics models that are created annually by the MMWG serve as the basis for studies to ensure the reliability of the entire Eastern Interconnection. These models are used not only by transmission planners, but also by federal and state agencies, including regulatory entities as well as consultants engaged by utilities, transmission and generation resource developers, regulatory and environmental groups for interconnection and siting studies, and as input for the development of public policies. In addition, such models are required to demonstrate compliance with NERC's mandatory reliability standards and for the development of various reports, assessments and industry guidelines.

Conclusions and Results

In less than a year since its formation, the Modeling Coordination Working Group:

- Was approved as a "liaison" representative of the MMWG and established a working relationship with the MMWG
- Submitted recommendations for clarification and enhancements to the procedural manual that were adopted by the MMWG
- Developed flow charts to illustrate the MMWG case selection and model

building processes that were also adopted by MMWG

- Reviewed and recommended specific improvements to NERC’s “Case Quality Metrics” procedures
- Tested and evaluated the new version of the models used for Eastern Interconnection power flow and dynamics analysis for consideration in the 2022 Case Cycle
- Evaluated several MMWG requests relating to:
 - Improvement of early data checking for dynamic models
 - Identification of “best practices” for review and improvement of the quality of generator models
 - Coordination of short circuit data for the Eastern Interconnection

G. Overall Observations and Conclusions

This report, as well as other studies completed by EIPC, demonstrate that the respective Planning Coordinator transmission planning and interconnection processes have yielded transmission plans that are well-coordinated on a regional and interconnection-wide basis.

EIPC studies also show that Planning Coordinators’ regional transmission plans, including generator retirements and additions, require continued study and interconnection-wide coordination to ensure that individual regional plans do not conflict with the regional plans of other Planning Coordinators.

The potential constraints and efficiencies identified through interconnection-wide analysis provide valuable information for local and regional system planners where they can be assessed to enhance their future transmission plans.

EIPC Support of State and Federal Agencies

EIPC has supported state and federal agencies with relevant information from its studies. As part of a 2009 DOE-funded grant, EIPC worked collaboratively with states and stakeholders throughout the Eastern Interconnection to analyze the transmission requirements and associated infrastructure cost estimates to support various stakeholder-identified renewable build-out scenarios. During the DOE Phase I grant work, EIPC worked closely with the Eastern Interconnection States' Planning Council, whose members included regulatory representatives from the 39 states in the Eastern Interconnection. EIPC continues to coordinate with state representatives through the newly revived National Council on Electricity Policy), which functions under the National Association of Regulatory Utility Commissioners (NARUC).

A second phase of EIPC's DOE grant work included an analysis of the interface between the natural gas delivery system and the electric transmission system so as to measure the resilience of key regions within the interconnection to potential disruptions to the natural gas pipeline system.⁸

Since that time, EIPC continues to support the DOE as a resource for information, feedback and analyses from the Planning Coordinators in the Eastern Interconnection. EIPC has regularly provided input to the DOE Annual Transmission Data Report, including providing data for the report and reviews of its content. EIPC has also provided input to the DOE's periodic congestion studies and has reviewed and provided comments on the DOE's regional and interregional transmission planning reports. In each case, EIPC serves as the single point of contact for most Planning Coordinators in the Eastern Interconnection.

EIPC continues to provide input to the DOE grid modernization projects being conducted by the National Labs. EIPC was extensively involved in the East-West Grid Ties project and participated on the Stakeholder Advisory Committee for the Grid Valuation project.

More recently, EIPC has provided assistance to Argonne Labs in the development of its planning and operations tools for gas-electric studies. EIPC also provided a review of the DOE transmission planning white paper⁹ and contributed to the DOE Transmission

⁸ The Final Report of the EIPC Phase One &PhaseTwo analysis can be found at [Phase II Documents — Eastern Interconnection Planning Collaborative \(eipconline.com\)](#).

⁹ [Economic Analysis and Planning Lau Hobbs2.pdf \(energy.gov\)](#)

Innovation Symposium held in May 2021 to help chart the course for future R&D to aid the transition to an energy future with a high penetration of renewable resources.¹⁰ EIPC is also a participant on the Technical Review Committee for the DOE's Near-Term Resilience & Reliability Study (NTRR).

Future EIPC Activities

EIPC continues to engage in collaborative activities that will enhance the transmission planning and coordination activities among the Planning Coordinators for the benefit of consumers across the Eastern Interconnection. As noted above, the Eastern Interconnection is one large interconnected machine that moves power throughout two-thirds of the United States and Canada. That machine is expected to change dramatically over the next decades, and that change must be managed through prudent and well-coordinated planning. With the collective expertise of its members, EIPC is uniquely suited to be the authoritative source of information to guide policymakers through the transformation and serve as the forum for interregional coordination of system design across the Eastern Interconnection. In support of this, EIPC's focal areas and future activities will include:

Providing Ongoing Insights on Potential Impact of Federal Policy Proposals on the Reliability and Resilience of the Eastern Interconnection

- EIPC continues to support the DOE and National Labs as a resource for information, feedback and analyses from the Planning Coordinators in the Eastern Interconnection. EIPC looks forward to providing its unique expert advice in support of the DOE's efforts to identify transmission expansion necessary for the administration's stated clean energy goals.
- In June 2021, the Federal Energy Regulatory Commission (FERC) and the NARUC announced the formation of a joint federal-state task force on electric transmission, which had its inaugural meeting on November 11, 2021. The task force will focus on topics related to efficiently and fairly planning and paying for transmission that provides benefits from a federal and state perspective. EIPC looks forward to providing the task force with insight regarding potential solutions to barriers to optimal transmission development and opportunities to utilize transmission planning processes to advance policy goals.

¹⁰ <https://www.energy.gov/oe/transmission-innovation-symposium>

- EIPC and its members remain actively engaged in various NERC activities in the review of grid reliability and consideration of industry standards, such as the Long-Term Reliability Assessment, the Energy Reliability Assessment Task Force, the Reliability Assessment Subcommittee, and more technical initiatives as described below.
- In July 2021, FERC issued an Advance Notice of Proposed Rulemaking seeking comments on the potential need for reforms or revisions to existing regulations to improve the electric regional transmission planning and cost allocation and the generator interconnection processes. EIPC and its members will continue to follow this proceeding and offer insights regarding interregional transmission planning across the Eastern Interconnection.

Enhancing Public Education on Challenges of Transitioning to a Utility-Scale and Distributed Intermittent Inverter-Based Resource-Dominated Grid

- In October 2021, EIPC published a white paper titled “Planning the Grid for a Renewable Future.” The paper recognizes that an energy transition is well underway, and the electric industry has already implemented many lessons learned while adapting to that change. Renewable wind and solar resources are rapidly growing throughout the Eastern Interconnection; however, that growth is not uniform in either the rate of adoption or technology type. Accordingly, the white paper focuses on what has been learned through historical experience and studies of future conditions by EIPC member regions as they relate to the planning and operations of high-renewable systems. The white paper concludes that these challenges, while significant, are not insurmountable but should be considered in the continued movement toward a power system made up of a significant amount of renewable resources. Most critically, EIPC urges grid operators and planners to be more engaged in the discussions to ensure continued delivery of reliable, efficient and affordable electricity to all consumers during the transition. EIPC will continue to assess these challenges as the grid transitions to a renewable future.
- The Frequency Response Report completed by EIPC in 2020 concluded that, while the Eastern Interconnection would have sufficient system inertia over at least the next five years for the projected system, maintaining frequency in the Eastern Interconnection will be a growing concern with the addition of more non-synchronous generation and planned retirements of synchronous generation. As recommended by the report, the EIPC continues to pursue improvements to the Eastern Interconnection dynamic models and the quality of data input to them.

- EIPC will continue to assess how generation tripping could lead to under-frequency load shedding events in the future due to the reduction of frequency support from synchronous generation. In order to study and plan for possible increased non-synchronous generation with reduced inertia, there is a need for improved frequency response simulation models. Accordingly, the EIPC Low Inertia Study includes a task to investigate the potential benefits of inverter-based resources for the mitigation of frequency decline upon loss of significant generation during low inertia periods.

Coordinating System Models to Assess Grid Reliability and Resilience

- The EIPC Modeling Coordination Working Group was formed to work with the MMWG to identify initiatives to improve the quality of the planning models as well as the effectiveness and efficiency of the MMWG model building process for the Eastern Interconnection. The EIPC has representation on the MMWG, which provides important collaboration between the Planning Coordinators of the Eastern Interconnection and the designated group responsible for building Eastern Interconnection models for NERC. Through this collaboration, EIPC has provided guidance on numerous process and model enhancements. In turn, the MMWG is working with EIPC to improve data checking for dynamic models, identify best practices for quality control of generator models, and coordinate short-circuit data for the Eastern Interconnection.
- EIPC's Frequency Response Report recommended that the MMWG pursue improvements to the Eastern Interconnection dynamic models. EIPC will continue to collaborate with the MMWG to: (i) use gross megawatt capability and generator auxiliary loads in the system models, (ii) emphasize the importance of appropriate selection and coordination of the frequency and turbine-governor-related model parameters, and (iii) consider the benefits of including load-frequency response characteristic models as part of the annual MMWG Dynamics Update process.
- While EIPC has been involved in the analysis of electric-gas reliability issues since its DOE Phase II work, EIPC established its own task force in 2019 charged with addressing both regional planning and operational procedures for assessment of the impact of gas supply disruptions on the bulk electric system. While planning and operations typically focus on different time frames, both utilize similar analytical tools to model the bulk system. Accordingly, the EIPC task force is a multi-disciplinary group made up of both planning and operations personnel. Recently, EIPC has provided assistance to Argonne Labs in the development of its planning and operations tools for electric-gas studies.

Engaging stakeholders regionally

- A cornerstone of any open and transparent planning process is stakeholder engagement. EIPC believes that the best approach for building on the considerable work of its interconnection-wide efforts while ensuring a regional focus is to utilize each member's existing stakeholder structure. EIPC members will work through the structure of their regional processes to provide updates of EIPC efforts and seek stakeholder feedback and input. The EIPC website will also include semi-annual updates on current and upcoming EIPC activities.

Stakeholder material and links to member websites may be found on the [EIPC web site](#).

These combined efforts of the EIPC members provide both an interconnection-wide view and the overall coordination necessary to ensure that the planning process is coordinated across all regions of the Eastern Interconnection. Additionally, these efforts will allow EIPC to stand ready to provide relevant, timely and technically sound information on issues impacting the grid as a whole.

About the EIPC

Formed under an agreement by 19 Planning Coordinators from the Eastern and Central U.S., EIPC provides a forum for interconnection-wide coordination of system planning activities of its member regions in the Eastern Interconnection while also providing policymakers and regulators with relevant, complete and technically sound information.

The EIPC membership includes:

Associated Electric Cooperative Inc.		Municipal Electric Authority of Georgia	
Cube Hydro Carolinas LLC		New York Independent System Operator Inc.	
Dominion Energy South Carolina Inc.		PJM Interconnection	
Duke Energy Carolinas Duke Energy Florida Duke Energy Progress		PowerSouth Energy Cooperative	
Florida Power & Light Co.		South Carolina Public Service Authority (Santee Cooper)	
Georgia Transmission Corp. (An Electric Membership Corporation)		Southern Company Services Inc., as agent for Alabama Power Co., Georgia Power Co. and Mississippi Power Co.	
ISO New England Inc		Southwest Power Pool Inc.	
Louisville Gas & Electric Company and Kentucky Utilities Company		Tennessee Valley Authority	
Midcontinent Independent System Operator (MISO)			



Appendix A: Current Regional Plans of the EIPC Members

1. [Associated Electric Cooperative](#)
2. [Cube Hydro Carolinas](#)
3. [Duke Energy Carolinas](#)
4. [Duke Energy Florida](#)
5. [Duke Energy Progress](#)
6. [Florida Power & Light Company](#)
7. [Georgia Transmission Corporation \(An Electric Membership Corporation\)](#)
8. [ISO New England](#)
9. [Louisville Gas and Electric Company and Kentucky Utilities Company](#)
10. [Midcontinent Independent Transmission System Operator](#)
11. [Municipal Electric Authority of Georgia](#)
12. [New York Independent System Operator, Inc.](#)
13. [PJM Interconnection](#)
14. [PowerSouth Energy Cooperative](#)
15. [South Carolina Electric & Gas Company](#)–
16. [South Carolina Public Service Authority \(Santee Cooper\)](#)
17. [Southern Company Services Inc., as agent for Alabama Power Company, Georgia Power Company, Gulf Power Company, and Mississippi Power Company](#)
18. [Southwest Power Pool](#)
19. [Tennessee Valley Authority](#)