Responses to Questions for the Record from the hearing entitled
"Keeping the Lights On: Examining the State of
Regional Grid Reliability."

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House Committee on Energy and Commerce,
Subcommittee on Energy

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The Honorable Robert E. Latta (R-OH)

1. As stated in President Trump's Executive Order "Removing Barriers to American Leadership in Artificial Intelligence" (AI EO) on January 23, 2025 "It is the policy of the United States to sustain and enhance America's global AI dominance in order to promote human flourishing, economic competitiveness, and national security." President Trump has made it clear that he wants the US to be the global leader in AI and unleash American energy.

How does MISO plan to ensure sufficient supply of energy to meet the needs of data centers in a timely manner?

As a general matter, the jurisdictional authority to assure resource adequacy belongs to the states and other Relevant Electric Retail Regulatory Authorities (RERRAs) in the MISO region, but MISO actively collaborates with them to achieve the shared mission of ensuring reliability. MISO also collaborates with neighboring regions to facilitate interregional transfers of electricity. Key mechanisms include:

- Providing RERRAs with region-wide information on where resource adequacy conditions are moving. Examples include MISO's annual Regional Resource Assessment, the annual Organization of MISO States – MISO Survey, and ongoing work on load forecasting.

- An annual Planning Resource Auction to provide a tool allowing market participants with excess capacity to sell to other market participants who may expect a shortfall in meeting their resource adequacy requirements.

- Long-Range Transmission Planning within the MISO region and the Joint Targeted Interconnection Queue study with neighboring regions to facilitate the construction of the new transmission lines necessary to deliver energy from where it is produced to where it is needed.

- Ongoing work to improve the timeliness of MISO's Generator Interconnection Queue by leveraging a combination of process and technology improvements. MISO is also seeking FERC approval for a temporary Expedited Resource Additions (ERAS) study process to expedite the approval and construction of generation projects needed to address near-term reliability issues.

2. 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, utilities and RTO/ISOs, often leading to inconsistent data, misaligned investment signals, and unnecessary risk for both utilities, and both large and residential customers. Recent inconsistencies underscore how a patchwork of forecasting methodologies can exacerbate speculation in large load interconnection requests, inflate demand

projections, and drive-up costs. These issues cross both state and federal jurisdictions and regional differences.

a. What steps is MISO taking to ensure its load forecasting is transparent, predictable and correctly anticipating future capacity and infrastructure needs to power AI infrastructure?

MISO is refining its load forecasting to better capture the evolving demands of AI and large-scale computing. This includes moving beyond traditional econometric models toward more detailed, end-use and market-based approaches that can better represent fast-growing segments like data centers. A key focus is on hourly-based modeling to track how load shapes are changing over time with shifts in technology and operations.

To support a well-rounded view of future demand, MISO draws on a range of inputs—member data, public announcements, third-party sources, and industry studies. These inform development of a range of forecasts that reflect assumptions for key variables such as adoption rates and facility efficiency. This helps facilitate planning without relying on any single data source.

MISO maintains transparency through regular stakeholder engagement—sharing forecasts, methodologies, and assumptions via workshops, whitepapers, and public data releases. Forecasts are being developed on a regular cadence, enabling MISO to incorporate new information more systematically and keep pace with rapidly evolving load drivers.

b. What, if any, barriers exist to increased transparency on potential load growth from AI?

Several factors create challenges in obtaining the information needed to accurately project load growth from AI. AI developers typically scout for multiple locations across various MISO members with masked company names for a single intended project. Until a location is secure, developers are sensitive about publicly disclosing the cost of competitive bids. Therefore, public land transactions are often the only observable signal of future data center development, but they provide little insight into load requirements, timelines, or viability.

Additionally, estimating energy use from land commitments is unreliable. Power Usage Effectiveness – a metric used to measure the energy efficiency of a data center – varies significantly across facilities due to design, operations, and climate. Retrofits and technology changes further affect load, making early-stage projections highly uncertain.

Also, Regional Transmission Organizations (RTOs) often do not have access to metered/end-use data, which limits the ability to validate or refine forecasts. Load data available to RTOs is often aggregated or otherwise adjusted before it reaches

us. Additionally, data sharing requirements may limit the willingness of entities to share commercially sensitive data with RTOs.

3. How can RTOs accelerate transmission expansion to support load growth without creating excessive costs for ratepayers?

MISO's processes have been successful in balancing the need for transmission expansion through pairing near-term transmission evaluation with a range of long-term scenarios to ensure that any recommended transmission is a least-regret solution to the near and long-term needs of the transmission system. As an example of this long-term planning, MISO analyzed and approved three regional portfolios (MVP 2011[1], Long Range Transmission Planning Tranche 1[2], and Long-Range Transmission Planning Tranche 2.1[3]) resulting in more than $37B of transmission investment and 345 and 765 kV regional solutions with benefits ranging in different portfolios from 1.6 to 3.8 benefit-to-cost ratios. These portfolios proactively identified solutions with benefits commensurate with costs, and they will result in a cost-effective transmission expansion for customers that support both resource change and load growth. These transmission recommendations are paired with a cost allocation design that aligns the benefits and assigned costs, lessening localized costs for transmission that will result in broader benefits.

4. From a siting and permitting perspective, what do you see as the challenges and barriers to constructing sufficient transmission infrastructure needed for reliable, safe, affordable, and timely delivery of power?

MISO's planning process attempts to identify and approve transmission in a 'just-in-time' manner – that is, we approve projects with consideration of how long these siting and permitting processes take, matching the timing of our approval to ensure they can be constructed by the time they are needed. We also partner with our members in our planning process to reduce siting and permitting risk and timelines through leveraging existing transmission corridors to minimize the need to attain new rights-of-way for transmission infrastructure. Finally, we support our members as the projects go through the appropriate state processes.

These processes can take time, and if that timeline is extended, it can delay the value to customers and more importantly put at risk the ability to maintain reliable delivery of power. However, in MISO, and with the steps outlined above, we work in concert with

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our members and our state regulatory agencies to minimize these timelines, with credit to states in our footprint for well-defined and efficient regulatory processes.

a. What role, if any, should Congress and FERC play in siting and permitting for regional or interregional transmission?

The state regulatory agencies in MISO have well-defined processes which reduce the timelines regarding regulatory approval for the transmission infrastructure to attain the necessary permits as much as possible. However, MISO has experience with transmission projects incurring significant delays (i.e., 10+ years) attaining the necessary permits from multiple federal entities and subsequent court challenges, especially when the siting involves crossing major rivers. These federal processes could be improved with Congressional or FERC input.

5. Regarding planning for transmission, what specific impediments have you identified to current state, regional, and interregional planning for transmission projects?

MISO has experienced limited impediments in transmission planning processes.

Specifically, MISO has been successful in creating three regional portfolios (MVP 2011[4], Long Range Transmission Planning Tranche 1[5], and Long-Range Transmission Planning Tranche 2.1[6]) resulting in more than $37B of transmission investment and 345 and 765 kV regional solutions with benefits ranging in different portfolios from 1.6 to 3.8 benefit-to-cost ratios. In addition to adding four new 765 kV tie-lines with interregional neighbors with Tranche 2.1, MISO's three Interregional Targeted Market Efficiency Project (TMEP) studies have resulted in ~$22M of investment and an estimated ~ $140M in benefits.

These processes can always be improved. MISO continues to work with our members and neighbors to align the definition of benefits for a given transmission study and to ensure appropriate cost allocation mechanisms are in place. For example, transmission driven by needs beyond NERC defined criteria, including economics or resilience, requires careful alignment from the start of analysis through the recommendation of solutions from identified needs. This can be further complicated by the uncertainty inherent in long-term timeframes. Without careful coordination and alignment on the

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assumptions and what to do with the results of studies, needed solutions can be delayed, impacting the efficiency of the transmission system.

a. What are examples of impediments you have identified and what is necessary for system planners to overcome these impediments?

Careful coordination is required at the start of any analysis to ensure that there is alignment on the potential benefits of transmission and how the costs could be allocated. This also includes alignment on what the future transmission system may look like, knowing that there are a range of possibilities. Recent federal actions, including FERC Order 1920, helps through providing a framework to use when considering the range of possibilities for the future transmission system, assisting with these impediments.

Ultimately, without support on cost allocation from member utilities and regulators, the projects and benefits identified in the planning process will not move forward. While the MISO region has been able to bring our members and states together to support cost allocation in the past, we continue to face the risk this may change in future planning studies. As noted, regional cost allocation in a multi-state region is a lengthy, complicated negotiation that only magnifies when trying to put in place interregional cost allocation methods for transmission lines that are benefiting neighboring multi-state entities, such as PJM, SPP, and TVA.

b. What reforms do you recommend to improve state, regional, and interregional planning to overcome these impediments?

FERC Order 1920 creates a common framework which can assist with transmission planning. It is also important, in the implementation of FERC Order 1920 or other reforms, that they provide sufficient flexibility for regional variation, rather than a prescriptive approach. This regional variation enables system planners to recognize the benefits that their customers value, ultimately providing more avenues for useful transmission construction than a one-size-fits-all approach.

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

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

MISO's transmission planning approach identifies and supports the development of cost-effective transmission infrastructure that is sufficiently robust to meet reliability needs, enable a competitive energy market, support state and member policy goals, and allow for competition among transmission developers. Additionally, these processes must be inclusive, independent, and transparent, with opportunities for stakeholders to participate and provide input throughout.

These processes include studies which focus on new generation resource integration, long-term transmission needs, near-term reliability requirements (including load integration), economic analysis, and interregional planning. Through them, MISO shares information with stakeholders and partners with other regions to identify transmission opportunities and takes action to find solutions. For example, MISO has ongoing studies with PJM and SPP at this time to understand and consider potential solutions that cross regional boundaries based on future system needs.

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?

The most efficient transmission planning approach must combine a top-down, long-term approach, such as those conducted by regional transmission organizations with consideration of more local and near-term needs best known by the utilities which directly serve end use customers. These processes are best defined with regional flexibility and in coordination with state entities and local stakeholders. The introduction of additional prescriptive requirements by FERC or any other entity creates a risk of hindering flexibility and removes opportunities to meet our members' unique needs and may result in inefficient transmission recommendations.

7. With current policies, do you think we can build all the generation and transmission needed in time for this AI race?

MISO's goal is to ensure that our processes appropriately support the generation and transmission required to support new large loads. This includes an expedited review of transmission needs for new loads, and it also includes a generation interconnection process which enables generation necessary for large load interconnections to be reviewed in a timely manner.

MISO's Expedited Project Review for transmission solutions provides an expedited review of transmission needs allowing Transmission Owners the ability to move forward with approved MTEP projects to meet load growth in as soon as 30 days, with additional time required for certain complex load integrations. These studies include the full suite of studies that are considered for our normal project review as well as coordination with our neighbors, in a more rapid timeline.

MISO has proposed an expedited study process to bring new generation resources online within a single calendar quarter, aiming to address the urgent resource adequacy and reliability concerns driven by rapid load growth. Traditional interconnection queue timelines are too lengthy to keep pace with this unprecedented need. While MISO is actively implementing long-term reforms—including automation and a queue cap—to shorten these timelines, this temporary fast-track solution offers a critical bridge. By accelerating projects meeting stringent eligibility requirements that are backed by their

state or other relevant authority, MISO ensures resources can receive a Generator Interconnection Agreement in a significantly shorter timeframe.

8. What would be your top priority or need from states, FERC or Congress to assist you in meeting new demand —especially if we need even more power than projected? Are you equipped today to meet increased future demand at the pace needed and to maintain affordability and competitive rates?

MISO has identified several challenges and opportunities to address growing demand. To address near-term needs, MISO is working with our stakeholders and the FERC to improve its existing processes and mechanisms. This includes the proposed expedited study process, designed to temporarily speed up the approval of key generation projects until longer-term enhancements to the generator interconnection queue process are effective.

It is also important to let reliability needs drive the pace of retirement of existing electric generating resources and to shape the mix of new resources being built. Today, no single resource type or technology can meet all our nation's electricity needs. For the foreseeable future, resource planners need to carefully assess the reliability impact before retiring existing electric generating resources and consider the operating characteristics and accredited generating capacity of new resources to ensure we can meet our nation's electricity needs every hour of every day.

Finally, it is important to consider barriers to the timely construction of new generation and transmission. Currently, the MISO region has over 56 GW of projects that have been approved but are not yet operational, and project developers have indicated that more than half of those are delayed, often due to regulatory hurdles, supply chain challenges, and labor shortages.

9. MISO and most other ISOs agreed, the Environmental Protection Agency's Clean Power Plan 2.0 negatively impacted the reliability of the bulk power system. If FERC was able to step in and make recommendations based on reliability during rule making processes, could that have a positive impact on the reliability of the bulk power system?

MISO respects the jurisdictional authority of both FERC and EPA and remains committed to sharing information and insights based on our experience as an RTO to support effective rulemaking. To that end, MISO has expressed its view that rulemaking should include provisions addressing reliability concerns. For example, in December 2023, MISO submitted joint comments – along with the Electric Reliability Council of Texas (ERCOT), PJM, and Southwest Power Pool (SPP) – to the EPA recommending that the agency craft a "Reliability Safety Valve" that would provide a reliability assurance mechanism to address potential resource adequacy issues.

The Honorable Mariannette Miller-Meeks (R-IA)

1. Ms. Curran, since 2022 MISO has developed and approved two tranches of significant transmission development under its Long-Range Transmission Planning (LRTP) Process. Please provide a detailed description of the generation resource mix for the MISO footprint that MISO transmission planners and stakeholders used to develop the tranches of the LRTP.

MISO can't predict the future, but it can make educated projections about what the electric system will look like in the coming years. To do that, MISO works with stakeholders to create forecasted scenarios which we call "Futures."

MISO's Futures study captures a range of potential system conditions over a 20-year planning horizon. The scenarios establish a bookended range of economic, policy, and possibilities such as load growth, carbon policy, and generation retirements. These forecasts hedge uncertainty by utilizing stakeholder information, policy direction, industry trends, and capacity expansion modeling.

Futures provide the foundation for MISO's transmission planning – both local and regional. By representing multiple possibilities for future system growth, fuel availability, market conditions, and regulatory environments, the scenarios also inform State and member resource planning. MISO is currently in the process of updating and expanding its Futures Planning Scenarios to reflect evolving conditions. These updated Futures will be utilized for future LRTP processes.

For the most recent LRTP Tranche 2.1, MISO utilized Futures Planning Scenarios published in November 2023. It was determined that Future 2A, which falls roughly in the middle of the range of possibilities, was most aligned with an optimized, least-cost expansion that meets member goals. This projected that by 2042:

- Electricity Production will be comprised of 51% wind, 22% solar, 1% natural gas, 1% coal, 7% nuclear, 2% hybrid resources, 8% storage discharge, 0.3% flexible resources (future resources with flexible attributes), and 8% other (e.g., hydroelectric, geothermal, biomass, fuel oil, etc.).

- Generating Accredited Capacity will be comprised of 34% wind, 24% solar, 14% natural gas, 1% coal, 3% nuclear, 2% hybrid resources, 7% battery, 6% flex resources, and 9% other resources.

<u>The Honorable John James (R-MI)</u>

1. I've heard repeatedly that strengthening the grid is a vital step necessary for meeting growing energy demands. Democratic governors in Lansing, Springfield, and St. Paul, however, are pushing "net zero". The Clean Power Plan 2.0, which is the catalyst for "net zero" mandated renewables and carbon capture for resources such as natural gas. While bipartisan, carbon capture is still a relatively new technology that is in development and needs time before it can be mandated.

Given MISO's purview of the Midwest, specifically Michigan, I wanted to quote one of your colleagues who testified in 2023 on behalf of MISO before this committee, where he mentioned the following:

"Controllable, dispatchable resources are being retired and replaced primarily with weather dependent, non-dispatchable, and variable generation types to achieve carbon reduction goals."

He went on to list the risks of weather dependent sources, which according to him were declining accredited capacity, diminishing resource attributes, and operational challenges. In your written opening statement, you mention that weather dependent energy sources do not provide "24/7 availability, flexibility, and duration attributes compared to the retiring power plants they are replacing."

a. I'd like to know from you what role natural gas will have in a state like Michigan in the foreseeable future. To the extent that you collaborate with stakeholders, I would also appreciate your thoughts on how the federal government can free up the regulatory environment for natural gas to best serve the "generation mix," given its reliability.

Today, no single electric generating resource type or technology can meet all our nation's electricity needs. While wind and solar, which comprise the bulk of new electric generation being built, bring many benefits such as being carbon free and having low electricity production costs, they don't have the same 24/7 flexibility and availability of the natural gas and coal burning power plants they are replacing. Promising future technologies – such as longer-duration battery, small modular nuclear reactors, and green hydrogen – are likely several years away from grid-scale viability. Thus, for the foreseeable future, natural gas will continue to play an important role by providing dispatchability and flexibility attributes, effectively serving as a 'reliability insurance policy' during challenging operating conditions.

b. I wanted to ask you about nuclear energy. I am excited that Palisades is coming back online, but arguably we cannot stop there. What is MISO's assessment of nuclear energy in Michigan and throughout the Midwest vis-à-vis the grid?

Resource planning decisions are the purview of the Relevant Electric Retail Regulatory Authorities (RERRAs) in the MISO region. MISO respects their jurisdiction and is committed to supporting their efforts to ensure the reliability of the bulk electric system.

In general, however, achieving regional reliability requires both adequate accredited generating capacity and adequate amounts of various operational attributes. The operational characteristics of nuclear energy have historically made it useful as a source of baseload electric generation, complementing the flexible characteristics of natural gas and the low-cost and emissions-free

characteristics of wind and solar. These are some of the many factors that RERRA's consider when making their resource planning decisions.

The Honorable Kathy Castor (D-FL)

1. One of our greatest challenges today is getting new sources of electricity on the grid as quickly as possible in this new era of increasing electricity demand. Interconnection processes – while critical to maintaining the reliability of the grid – can also take far too long under the current framework.

On March 17, FERC Commissioner David Rosner wrote a letter to each of you detailing new opportunities to streamline the interconnection process. In a recent study by the Midcontinent Independent System Operator (MISO), an automated process was able to nearly replicate in ten days the results of an interconnection study that took nearly two years to conduct.

a. Please describe your experience with interconnection automation technologies to date and the prospects for further deploying them going forward.

MISO's implementation of Suite of Unified Grid Analyses with Renewables ("SUGAR") software utilizes advanced data and analytics using machine learning and artificial intelligence to create reliable and informed planning and operations, as well as significantly lower study and modeling times. Full implementation of SUGAR will take study times from more than three years to under one year. But it will likely take about three years for the full implementation of SUGAR. Allowing for an accelerated study process for certain projects will address queue backlog until the entire queue process is improved to a near one-year timeframe.

b. Please describe how FERC and Congress can each support such innovation.

MISO has a culture of continuous improvement and actively seeks to examine, test, and, where appropriate, incorporate new processes and technologies that will continue to support reliability while improving efficiency and effectiveness. This can most readily be achieved through a statutory and regulatory environment that prioritizes reliability and encourages innovation.

Public discourse by policymakers and lawmakers, such as this Subcommittee's recent hearing and FERC technical conferences – including FERC's July 2025 Technical Conference on "Increasing Efficiency through Improved Software – also stimulate broader conversations and information sharing around the shared challenges facing the electric industry and potential innovations to help address those challenges.

The Honorable Scott Peters (D-CA)

1. Have you experienced permitting delays that this committee should better understand? What are some key/important examples?

MISO is facing a growing resource adequacy and reliability challenge across its region. As of June 11, 2025, more than 56 gigawatts of generation within the MISO footprint had executed Generator Interconnection Agreements but had not yet come online. In late 2024, MISO surveyed interconnected customers to better understand this disconnect and identify the causes of these delays. While responses varied—from economic conditions to supply chain constraints—a common theme emerged: regulatory challenges were reported across nearly all states and fuel types, highlighting a widespread barrier to timely project completion and grid readiness.

MISO has experience with transmission projects incurring significant delays (i.e., 10+ years) attaining the necessary permits from multiple federal entities and subsequent court challenges, especially when the siting involves crossing major rivers. These federal processes could be improved with Congressional or FERC input.

2. What laws (on permitting specifically, but also planning, siting, interconnection, cost allocation, etc.) should be changed/amended/improved with regard to permitting?

MISO does not advocate for a specific statute, but as a general principal we urge the prioritization of reliability needs, mitigation of hurdles to developing new generation and transmission, and streamlining of statutes and regulations that can hinder progress toward achieving reliability goals.

3. What are your specific challenges when it comes to planning and cost allocating high voltage transmission lines?

MISO has experienced limited impediments in transmission planning processes.

Specifically, MISO has been successful in creating three regional portfolios (MVP 2011[7], Long Range Transmission Planning Tranche 1[8], and Long-Range Transmission Planning Tranche 2.1[9]) resulting in more than $37B of transmission investment and 345 and 765 kV regional solutions with benefits ranging in different portfolios from 1.6 to 3.8 benefit-

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Ultimately, without support on cost allocation from member utilities and regulators, the projects and benefits identified in the planning process will not move forward. While the MISO region has been able to bring our members and states together to support cost allocation in the past, we continue to face the risk this may change in future planning studies. As noted, regional cost allocation in a multi-state region is a lengthy, complicated negotiation that only magnifies when trying to put in place interregional cost allocation methods for transmission lines that are benefiting neighboring multi-state entities, such as PJM, SPP, and TVA.