ARKANSAS ENERGY RESOURCES PLANNING TASK FORCE

REPORT 2021

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I. EXECUTIVE SUMMARY

Extreme cold temperatures and snow in Arkansas and surrounding states during a February 2021 winter weather event disrupted fuel supply, primarily natural gas, for electricity generation and heating. Furthermore, some electric generating units underperformed during the event, and transmission constraints resulted in stranded capacity. At the same time fuel supply and transmission were constrained, electric and gas utilities experienced unprecedented winter demand in the region. In some cases, the demand exceeded summer peaks.

Despite the challenges experienced during the February 2021 winter weather event, coordination among the utilities, state departments and agencies, and multiple regional transmission organizations ("RTOs") ensured that Arkansas fared well during the storm with only limited, short-duration outages during the storm. Arkansas benefited from utility participation in RTOs that were able to draw energy from a wide geographic region with a diverse portfolio of electricity generating assets. The state also benefitted from the existence and availability of interruptible tariffs for large electric customers who voluntarily accept curtailment to reduce the load on the electricity grid in exchange for discounted electricity rates. Where natural gas supply was constrained, human needs were prioritized to ensure that Arkansans stayed warm. Communication of the need to conserve energy was broadcast widely across the state and Arkansans stepped up to meet the need.

Although Arkansas demonstrated that it is well-prepared for events like the February 2021 winter weather event, lessons learned during the storm provide the state with the opportunity to examine what processes worked well and what can be improved upon to ensure reliability during extreme events. To review and analyze lessons learned and develop recommendations, Governor Asa Hutchinson created the Energy Resource Planning Task Force ("Task Force").

After reviewing testimony from regulators, fuel suppliers and transporters, utilities, and energy users, the Task Force has identified potential opportunities for improved communication in advance of and during energy disruptive events and potential opportunities for improving the reliability of energy infrastructure. If outages are necessary to ensure the reliability of the electricity grid or curtailment is necessary due to limited fuel supply or weather-related electric outages, the Task Force recommends prioritizing energy so as to preserve human life, health, and safety and, to the extent possible, to businesses and industry that would otherwise incur damage to equipment or experience severe economic harm. The lessons learned and Task Force recommendations are discussed in more detail within this report.

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II. ACRONYMS AND ABBREVIATIONS

AECC	Arkansas Electric Cooperatives Corporation
AEEC	Arkansas Electric Energy Consumers, Inc.
AEF	Arkansas Environmental Federation
AF&PC	Arkansas Forest and Paper Council
AGC	Arkansas Gas Consumers, Inc.
AIPRO	Arkansas Independent Producers and Royalty Owners
AMPA	Arkansas Municipal Power Association
AGA	American Gas Association
AOGC	Arkansas Oklahoma Gas Corporation
APGA	Arkansas Propane Gas Association
Black Hills	Black Hills Energy Arkansas, Inc. and Black Hills Corporation
CenterPoint	CenterPoint Energy, Inc.
Commerce	Arkansas Department of Commerce
DEQ	Division of Environmental Quality
E&E	Arkansas Department of Energy and Environment
Empire	Empire District Electric Company, Liberty Utilities Co., and their parent company: Algonquin Power & Utilities Corp.
EPN	Energy Policy Network
Entergy	Entergy Corporation and Entergy Arkansas, LLC
EO 21-05	Executive Order 21-05
ERCOT	Electric Reliability Council of Texas
FERC	Federal Energy Regulatory Commission
LP-Gas	Liquefied Petroleum Gas (Propane)
MISO	Midcontinent Independent System Operator, Inc.
NERC	North American Electric Reliability Corporation
O&GC	Arkansas Oil and Gas Commission
OG&E	Oklahoma Gas and Electric and OGE Energy Corp.
PPGMR	PPGMR Law, PLLC
PSC	Arkansas Public Service Commission
Quattlebaum	Quattlebaum, Grooms & Tull PLLC
RTO	Regional Transmission Operator
SPP	Southwest Power Pool, Inc.
SWEPCO	Southwestern Electric Power Company
Task Force	Energy Resource Planning Task Force established under Executive Order 21-05

III. INTRODUCTION

On March 3, 2021, Governor Asa Hutchinson issued EO 21-05, creating the Task Force to review lessons learned from the February 2021 winter storms by hearing testimony from a list of identified public and private sector leaders and any other citizen as the Task Force deems necessary; provide recommendations to the Governor for actions needed to ensure adequate supply of critical energy sources during extreme events; and develop priorities for allocation of limited energy resources should supply shortages due to emergency situations necessitate action to preserve life, health, and safety. Becky Keogh, Secretary of E&E; Lawrence Bengal, Director of the Arkansas O&GC; Kevin Pfalser, Director of the Arkansas LP-Gas Board; and Mike Preston, Secretary of Commerce, served as members of the Task Force. Secretary Keogh served as the Task Force Chair. Attached and marked for identification purposes as "Appendix A" is the full text of EO 21-05.

The Task Force conducted three meetings between March 10, 2021, through May 12, 2021, to discuss the entities from which the Task Force should request testimony, the schedule and format of Task Force meetings and hearings, and pre-hearing testimony questions. On April 9, 2021, the Task Force submitted pre-hearing questionnaires to interested parties and requested that each entity respond by April 30, 2021. Between May 27, 2021, and June 2, 2021, the Task Force held three hearings to provide responsive parties the opportunity to discuss lessons learned from the February winter storms, and to allow the Task Force members to ask questions regarding the responsive party's pre-filed written testimony and any oral testimony provided at the hearing. Attached and marked for identification purposes as "Appendix B" are Task Force Meeting and Hearing Materials.

This report presents the findings and recommendations of the Task Force after reviewing the testimony gathered through pre-hearing questions and hearings, and all documentation submitted to the Task Force in association with this testimony.

A copy of this report was delivered to each entity named in Section V.

IV. REVIEW OF LESSONS LEARNED DURING THE FEBRUARY 2021 WINTER WEATHER EVENT

Pursuant to EO 21-05, Governor Asa Hutchinson's first directive to the Task Force was to review the lessons learned from the February winter storms, including lessons from surrounding states and information gathered by hearing testimony from the following:

- The Chair of PSC, or his or her designee;
- A representative of MISO;
- A representative of SPP;
- A representative of Entergy;
- A representative of AECC;
- A representative of SWEPCO;
- A representative of OG&E;
- A representative of Empire;
- A representative of AMPA;
- A representative of CenterPoint;
- A representative of AOGC;
- A representative of Black Hills;
- A representative of AEEC;
- A representative of the Arkansas State Chamber of Commerce;[1]
- The Executive Director of AEF, or his or her designee;
- The President of AIPRO association, or his or her designee;
- Additional citizens, as the Task Force deems necessary, with knowledge and expertise in energy and environmental matters; and
- Additional citizens, as the Task Force deems necessary

The Task Force received written and/or oral testimony from the following entities:

1. Chairman Ted Thomas of PSC – Oral and Written
2. Attorney General's Office – Oral and Written
3. MISO – Oral and Written
4. SPP – Oral and Written

[1] Arkansas State Chamber of Commerce was sent a request to provide testimony to the Task Force, but the entity did not provide written or oral testimony to the Task Force.

5. AEF – Oral and Written
6. AEEC and AGC – Oral and Written
7. AF&PC – Oral and Written
8. Quattlebaum – Oral and Written
9. Black Hills – Oral and Written
10. CenterPoint – Oral and Written
11. AIPRO - Oral
12. AMPA – Oral and Written
13. Empire – Oral and Written
14. OG&E – Oral and Written
15. SWEPCO – Oral and Written
16. AECC – Oral and Written
17. Entergy – Oral and Written
18. EPN and Jackson Walker Law Firm – Oral and Written
19. PPGMR – Oral and Written
20. Ozark Mountain Petroleum, Inc. – Oral and Written
21. Craft Propane Inc. – Oral and Written
22. NGL Supply Wholesale – Oral and Written
23. APGA and Island Energy – Oral and Written
24. Enable Midstream - Oral
25. Summit Utilities - Oral
26. AOGC
27. CHS, Inc. – Oral and Written
28. Enterprise Products Partners LP - Written
29. AGA - Written

Attached and marked for identification purposes as "Appendix C" are the written responses received by the Task Force to pre-hearing testimony questions and supporting documents provided to the Task Force.

A. Communication

1. Notification of Potential for Curtailments

   Across the board, electric and gas utilities engaged in extensive outreach efforts to notify their customers of the potential for curtailments and the need to conserve energy during the February 2021 winter weather event. Local utility companies employed a variety of communication strategies, including: media notices, press releases, social media, text messaging, email, and webpage updates. Nevertheless, a few natural gas customers

reported that they were unaware that they were being curtailed until a technician showed up to turn off their gas. In other cases, customers received notices that their home or business was part of a circuit selected for curtailment after the outages had already begun. In their testimony to the Task Force, utility company representatives provided lessons learned on how they could potentially improve their process for notifying customers of curtailment based on the challenges experienced during the February 2021 winter weather event.

One challenge to the notification process identified by representatives from CenterPoint and AOGC during the February 2021 winter weather event was contacting the right person within large industrial organizations. This challenge presents an opportunity to be better prepared in the future by updating contact information more frequently. In addition, CenterPoint representatives suggested that increasing the number of staff to make phone calls would help improve the notification process if a future energy emergency arises.

Another challenge identified by Entergy representatives was the short-time frame between being informed by the RTO about the directive to initiate curtailments and when the first curtailment commenced. This short time frame made it difficult for utility companies to provide advance notice to individual customers that their power would be curtailed. Entergy representatives stated that the Company has taken steps to enable it to be better able to direct communication about which customers are next to experience outages if they were to identify and maintain a contact list for the customers served on each of their circuits. Additionally, Entergy representatives noted that it may continue to be difficult to notify customers on the first circuits curtailed during a coordinated outage directed by an RTO but that it would be possible to provide advance notice to customers on the subsequent circuits that would be curtailed in those events.

2. Notification of Shifts in Pricing

Some energy consumers and municipal utilities were unaware and surprised by high energy bills after the February 2021 winter weather event. Multiple energy consumer representatives indicated that they had no real-time indication of prices. If there had been a system in place to notify them when energy prices exceeded a specified threshold, they testified that they may have chosen to curtail operations voluntarily instead of continuing to operate.

This challenge presents an opportunity for energy consumers and their suppliers to add additional language to their private service contracts to implement a system that would provide for real-time price signaling to consumers. Various presenters noted that both MISO and SPP provide timely information on the wholesale prices of electricity on their web pages. Additionally, presenters noted that the market prices for natural gas are also publicly available. Electric and natural gas utilities file their energy cost rates with PSC, and those rate schedules are available on PSC web page. Municipal electric utilities that

purchase wholesale electric capacity and energy may want to discuss opportunities to obtain price information from their wholesale providers.

3. Availability of Special Needs Affidavits

   Prior to the February 2021 winter weather event, some natural gas consumers were unaware of the need to file a human-needs affidavit certifying that they have a facility with human-needs usage requirements. Examples of human-needs customers include hospitals, housing, greenhouses, poultry farms, and schools (except those with central boiler plants for heating and an alternative fuel source). Human-needs customers are exempt from curtailment. The human needs affidavits are a component of the interstate natural gas pipeline companies with FERC approving tariffs to their customers who either are or who serve human needs customers. Those transactions are not subject to any regulation at the state level.

   AGC representatives also discussed the availability of special needs affidavits for plant protection. When gas supplies are limited, some pipelines may reduce their load by reducing the flow of gas to a transportation customer (a customer who buys directly from the pipeline) to the minimum necessary to keep equipment from freezing if the customer has a special needs affidavit, plant protection affidavit, or both on file with the pipeline. Otherwise, the customer may be completely shut off from gas or incur substantial penalties for burning gas during a curtailment event. Being completely shut off from gas may damage equipment for some transportation customers.

   Representatives from AEEC, AGC, AF&PC, Quattlebaum, and Black Hills suggested that more education about human-needs, special needs, and plant-protection affidavits would be beneficial to prevent those facilities serving human needs or for which curtailment would damage equipment from being curtailed because they don't have an affidavit in place.

B. Adequacy of Existing Energy Infrastructure

In their testimony to the Task Force, some representatives provided lessons learned about the challenges the existing energy infrastructure faced during the February 2021 winter weather event.

1. Natural Gas

   Testimony from representatives of multiple entities indicated that the shortage of natural gas supply during the February 2021 winter weather event was due in large part to freeze-offs at natural gas production facilities in Texas and Oklahoma that deliver natural gas for use in Arkansas and other states. At the same time supply of natural gas was reduced, demand for natural gas for heating and electricity generation experienced unprecedented winter peaks. The supply and demand imbalance contributed to spiking prices for natural gas and the need for natural gas curtailment and short-term, localized, and controlled electric load shedding events. Following review of the pre-filed written testimony, and

listening to the testimony of those who appeared before the Task Force, it is evident that the natural gas industry in the state performed remarkably well under the most extreme circumstances. All personnel working in the natural gas industry here in Arkansas should be commended for their performance and success at preserving enough supply to be used for meeting human needs.

a. Preparation of Natural Gas Production Facilities for Freezing Conditions

The natural gas production facility freeze-offs that occurred in Arkansas appear to be the result of insufficient weatherization of Arkansas natural gas wells and compressors in freezing temperatures experienced during the February 2021 winter weather event. For example, the representative from AIPRO testified that many of the natural gas producers in Arkansas worked to borrow heater facilities for their systems. However, Arkansas producers were only able to access approximately sixty heating units; whereas, there are thousands of wells in the state. Therefore, producers prioritized top producing wells for weatherization during the February 2021 winter weather event. In addition, road closures due to snow and ice also imposed a difficulty for producers to access wells. While additional heating equipment may have helped maintain production of additional wells, the AIPRO representative suggested that the cost of preparing for a fifty year event may not be economically feasible for producers.

A MISO representative suggested that setting winter weatherization standards to protect generation and fuel supplies from freezing conditions would mitigate risk of diminished generation and supply during rare winter weather events. If developed, such standards would be established in coordination between RTOs and their members. However, increased weatherization of wells and well compressors would come with increased costs for equipment that are not needed on a routine basis, and those costs need to be weighed against the potential benefits.

b. Natural Gas Supply Streams and Storage

Although Arkansas has ample natural gas resources and is a net exporter of natural gas, some of the natural gas used in Arkansas is produced out of state. The Fayetteville Shale gas development in Arkansas in the mid-2000s occurred after infrastructure to bring natural gas into Arkansas had already been established. Therefore, the majority of natural gas produced within the state is transported out of the state to the east. This dependence on interstate supply for natural gas obtained from un-weatherized wells in Oklahoma and Texas resulted in a shortage of supply to Arkansas utilities in February 2021.

Examples of affirmative measures that could be taken to reduce Arkansas's dependence on interstate natural gas supply include development and connection to additional supply basins, additional local supply or local storage capability, and improved or new interconnects for pipelines. A representative from CenterPoint

suggested that such measures add incremental reliability. However, the improved reliability from these measures would come at a cost to the utility companies, customers, and upstream providers and those costs would need to be evaluated relative to any potential benefits.

Local storage of natural gas, either at storage facilities along the pipeline or at industrial or utility company sites where the natural gas is used, can mitigate temporary imbalances in production and demand. For example, a Black Hills representative described additional storage facilities approved by PSC in 2015 as a means to allow utility companies and other providers to meet demand during the February 2021 winter weather event. However, the low cost of natural gas means that onsite storage solutions are not economically favored without outside incentives.

2. LP-Gas (Propane)

Based on a review of the testimony provided, the month of February in 2021 may have been the worst month in the history of the LP-Gas industry in Arkansas. The freezing temperatures that affected the natural gas pipelines also affected the LP-Gas pipelines, which caused terminals in the area to go off-line. Unlike natural gas, from the terminal to the end user, LP-Gas is delivered by truck, so deteriorating road conditions prevented transport deliveries. In addition to this, NGL Energy Partners, LP made a business decision in 2020 to de-commission a million-gallon storage terminal in the central part of the state. This required transporters to travel further distances to pull more LP-Gas from outside the state. By February 20, 2021, there were several LP-Gas dealers that had little or no supply of propane. The LP-Gas industry personnel should be commended for their tireless effort to make sure their customers had heat in their homes during this challenging time period.

The Task Force heard testimony from representatives in the LP-Gas industry regarding constraints on propane supply and distribution during the February 2021 winter event. Prior to the event, supply was already constrained due to higher demand during the winter than in summer, creating an imbalance in pipeline allocations. The LP-Gas needs during the events exceeded forecasted demand and pipeline shipment of ordered LP-Gas from Texas was delayed. In addition, LP-Gas supply from the Valero Refinery was unavailable during the February 2021 winter weather event due to a small explosion at the refinery. Some LP-Gas that was ordered by dealers was not delivered. There are also no LP-Gas terminals or other supply in the western part of Arkansas. As a result of the supply interruptions and lack of supplemental local supply, LP-Gas carriers traveled farther to obtain supply to meet demands in Arkansas. Further complicating matters, hazardous road conditions made delivery of LP-Gas by truck more difficult.

LP-Gas industry representatives explained that lifting the hours of service requirements for LP-Gas drivers during the emergency enhanced their ability to serve customer demand during the February 2021 winter weather event. LP-Gas industry representatives

suggested that lifting the requirements sooner in anticipation of an event would be beneficial. Additionally, temporary exceptions to gross vehicle weight limits for LP-Gas transports in anticipation of extreme weather events was recommended by LP-Gas industry representatives to enhance transport of propane supply.

LP-Gas industry representatives suggested that additional propane storage at retail locations and additional terminals might mitigate supply disruptions and insufficient pipeline allocation. A representative from Ozark Mountain Petroleum, Inc. suggested that strategic placement of rail facilities around the state would help secure adequate propane supply. However, additional storage also comes with additional cost. APGA representatives suggested reducing taxes and fees as an incentive to invest in storage and equipment. In addition, ensuring that existing storage is kept full would also help to mitigate potential supply disruptions.

3. Electricity

The coordination among PSC, electric utility companies, and RTOs helped Arkansas manage the challenges experienced during the February 2021 winter event. Arkansans benefited from the participation by Arkansas utilities in two RTOs that were able to pull electricity from a wide geographic region with a diverse energy resource mix. Utility companies and RTOs had well-rehearsed plans in place prior to the event to effectively disseminate information about conservative and emergency operating conditions that allowed them to react quickly to maintain the reliability of the grid. The electricity industry personnel should be commended for their tireless effort to power Arkansas homes during the February 2021 winter weather event.

a. Performance of Existing Electric Generation Fleet

Electric industry representatives testified that each fuel source within the existing electric generating fleet experienced some challenges during the February 2021 winter weather event, which further constrained energy resources. However, the electric industry representatives noted that Arkansas utilities' diverse fuel resources and participation in the MISO and SPP RTOs significantly limited the number of outages actually experienced during the event. An Empire representative explained that they had issues across their generating fleet, including coal plants that had frozen coal or tripped offline, low gas pressure issues on some natural gas thermal generators, and some frozen turbines on wind farms that were not winterized. A SPP representative confirmed that both coal and natural gas generating facilities in the region experienced weather-related challenges that affected the performance of those units relative to how those resources are accredited for reliability purposes. Although wind turbines were not very productive during the period of the February winter storm, an SPP representative confirmed that this lack of productivity was consistent with forecast.

A MISO representative explained that winterization of generators, in addition to fuel

supply winterization, might mitigate risks associated with conditions like those experienced during the February 2021 winter weather event. There are currently no standardized winterization criteria in the MISO region. However, the MISO representative suggested that such criteria would need to be assessed by MISO and its members. The MISO representative also suggested that there would be a need for an entity to monitor or verify weatherization of the generation fleet. Further, the MISO representative noted that it would be essential to evaluate the cost associated with weatherization of the generation fleet and whether those expenditures would be reasonable and appropriate relative to the expected benefits.

The MISO representative also explained that the February 2021 winter weather event, as well as other maximum generation event days that have occurred outside of the summer months in recent years, suggests that resource adequacy planning should be refined. Past practice was to plan for adequate resources to meet the projected summer peak. The MISO representative explained that changing to a seasonal resource adequacy construct could help account for seasonal variation in fuel availability and generation capability.

b. Performance of Existing Transmission Infrastructure

Some of the load shedding events during the February 2021 winter weather event were a result of transmission constraints rather than lack of energy. However, as the electric utility and RTO representatives noted, there were limited customer interruptions both in number and duration during the event. At times during the winter weather event, overloading of transmission lines and regional transfer limits hindered the ability to move energy to specific areas where it was needed. In addition, an Entergy representative also explained that transmission constraints caused a derate at one of the units at the Nuclear One facility in Arkansas for a few hours, which was otherwise performing exceptionally. Entergy Arkansas representatives further noted that its investment in its transmission infrastructure over the past several years helped ensure reliable electric service and limited the impact of the event.

Although there were localized transmission constraints, the ability for MISO and SPP to pull energy from other regions in the Eastern Interconnect dramatically reduced the impact from weather-related challenges such as insufficient gas supply and generating units that tripped offline in the MISO and SPP regions during the February 2021 winter weather event. The MISO representative explained that the addition of new transmission capacity and improved interregional coordination and interconnection would bring significant efficiency and reliability benefits. The PSC Chairman, as well as the electric utility and RTO representatives, all noted that participation in the MISO and SPP RTOs significantly contributed to reliable performance during the event and helped limit the number and duration of any outages.

c. Diversity of Generation Assets

Several entities provided testimony about how diversity of types and geographic location of generating assets provide a significant reliability benefit. Both MISO and SPP representatives explained that the interconnection of RTO regions on the Eastern Interconnect was a tremendous benefit to reliability because they were able to pull energy from areas that were not severely impacted by the February 2021 winter weather event. Both RTOs have a diverse mix of generation asset types. As noted by the PSC Chairman and the electric utility and RTO representatives, the diverse fuel mix in the Arkansas generation portfolio mitigated the number of and duration of outages.

While the majority of testimony pointed to a natural gas supply shortage used for electric generation due to freeze-offs and transmission constraints as the primary cause of the power shortage during the February 2021 winter weather event, EPN representatives cited a different cause. EPN representatives opined that the primary cause of the power shortage during the February 2021 winter weather event was "Arkansas's contractual ties to RTOs that have collectively closed 60 baseload power plants (over 22,000 MW) in the past five years" and the replacement of those plants with intermittent generating resources. The EPN representatives suggested that, if those baseload power plants had not been retired, the region would not have had the outages experienced during the February 2021 winter weather event. However, the electric utility and RTO representatives all provided testimony that the outages in Arkansas and in the MISO and SPP regions were limited in numbers and duration during the event. Those representatives further noted that the diverse fuel mix of Arkansas's generation fleet, investments in generation, transmission, and distribution assets, as well as participation in the MISO and SPP RTOs helped Arkansas manage the storm and mitigate outages.

C. Planning for Reliable Energy

There were numerous suggestions regarding how to ensure the reliability of future energy infrastructure. These suggestions touched on transmission, current and planned generation assets, and load management.

1. Transmission

As previously noted, transmission constraints hindered the movement of electricity during the February 2021 winter weather event. The MISO representative explained to the Task Force that transmission expansion in the present could mitigate risks associated with such events, but transmission expansion will become even more necessary to accommodate significant increases in renewable energy generation and other projected changes to the grid, including electrification of vehicles and other sectors. The MISO representative explained that MISO's plans evaluate additional interconnection, examine load pockets, and work with seams partners to increase coordination. The SPP representative explained that strong transmission interconnections increase their ability to

rely on generation in its footprint as well as energy transfers from neighbors to mitigate supply deficiencies during an emergency. Both MISO and SPP have established processes to evaluate the transmission investment needs within their footprints and to make plans to ensure that the investments necessary to maintain a reliable bulk electric system are made by the transmission owners. That process includes participation from the electric utilities, state regulators including PSC, and transmission customers. The MISO and SPP processes are open forums where the investments needed to ensure reliability are discussed and evaluated. Further, many of the electric utilities' transmission investments require PSC review and approval in an open, public process.

2. Current and Planned Generation Assets

Arkansas investor-owned utility companies participate in RTOs that operate a market-based system for directing dispatch of generation assets within their region. RTOs are responsible for ensuring the reliability of the high-voltage electric transmission system and directing dispatch of generation resources to ensure the reliable and cost-effective delivery of energy. RTOs use an energy market to direct dispatch of energy resources. The energy market takes into account forecasted energy needs, system constraints, state laws, and operation profiles of different types of generation assets to manage risk and deliver least-cost energy. In addition, the RTOs have established procedures for ensuring the reliability of the electric grid in preparation for potential events and during energy emergency events. Additionally, pursuant to statutory authority in Arkansas, PSC conducts reviews of electric utility resource plans every three years. Those plan reviews are conducted in an open forum that allows for participation and input from stakeholders. Those "integrated resource plans" help utilities plan for the generation investments needed to meet the load that they serve.

The Task Force heard different perspectives on the maintenance of current generation assets and how to direct investment in new generation capacity. The electric utility company and MISO representatives indicated that they were in the process of re-evaluating planning and market products to meet the reliability imperative, taking into consideration the evolving grid, and to move to a seasonal construct for resource adequacy determinations. EPN representatives recommended enacting legislation and rules in Arkansas to direct retention of and investments in baseload thermal generation. However, PSC resource planning process described above provides a forum to evaluate the electric utility plans for generation needed to meet their load. Furthermore, the Arkansas General Assembly enacted Act 694 during the 2021 session, which requires electric utilities to consider the costs and benefits of extending the life of existing generating resources as part of the established resource planning process.

An SPP representative explained that Arkansas benefits from vertically integrated regulatory systems in Arkansas and in other states whose utilities participate in SPP and MISO markets. In deregulated systems without a capacity market, like ERCOT, the cheapest generation is built first. In ERCOT, the cheapest energy resource is wind, which

often bids into the market in negative prices due at least, in part, to the impact of the production tax credits for wind generation facilities. Regulated systems allow the states to enact policies to direct prudent investments in energy infrastructure with a focus on reliability as well as economics because utility companies must justify investments to PSC in order to earn a return on their investment from ratepayers. The experience of the Arkansas electric utilities that are members of the MISO and SPP RTOs during the winter weather event was significantly different than the participants in ERCOT.

EPN representatives suggested that existing baseload dispatchable generation planned for cessation of operations should be retained and used for operating reserve. EPN specifically mentioned three power plants in Arkansas (one natural gas and two coal plants) where Entergy plans to cease operations or cease use of coal. The Entergy representatives explained that, given the required investments needed for these facilities that are nearing the end of their useful lives, maintaining those units as a backup would not be efficient or cost-effective, and there are better alternatives. The Entergy representatives suggested it would be more cost-effective to invest in newer, more efficient technologies that can serve as longer-term resources to customers.

EPN representatives also suggested that any new intermittent generation assets should be backed with a firm power purchase contract to purchase from dispatchable thermal generation assets. This resource adequacy approach was also mentioned in a report provided by MISO.[2] The MISO report suggested that they would need to consider how to incorporate fuel assurance requirements in a cost-effective manner when such a resource may only be needed a few times a year. PSC's established resource planning process provides an opportunity for evaluating the needs for generating resources, including whether new resources are cost-effective and how they affect reliability. Further, the MISO and SPP RTO planning processes under the FERC and NERC regulations require the participating electric utilities to have adequate generation to meet their load plus an adequate reserve margin. These requirements help ensure that there are adequate resources to meet the needs of Arkansas customers.

MISO provided the Task Force with a detailed report of lessons learned with regards to systems planning, as well as other MISO operations, that the RTO plans to implement in coordination with market participants and other stakeholders.[3] Specifically, MISO plans to move to a sub-annual (4-season) resource adequacy construct and implement changes to its resource accreditation criteria to better reflect resource availability during hours when the system is most in need and during extreme weather events. In its seasonal assessments, MISO plans to focus more attention to extreme scenarios (high loads and high outages). MISO explained that these changes should provide an incentive to

[2] "The February Arctic Event: Event Details, Lessons Learned and Implications for MISO's Reliability Imperative" included in Appendix C of this Report.
[3] MISO provides a comprehensive list of Lessons Learned and Actions to Address the Lessons starting on page 48 of it's "The February Arctic Event: Event Details Lessons Learned and Implications for MISO's Reliability Imperative" report provided to the Task Force during the May 27, 2021, hearing.

resource owners to invest in winterization, fuel assurance, and other means of ensuring resource availability. This market-based approach mitigates risk while providing flexibility to keep the cost of the bulk electric system low. The RTOs continue to evaluate their resource adequacy constructs as the energy resource mix and risk profiles evolve. The PSC and RTO resource planning processes provide open forums to evaluate the electric utility industry's actions to ensure that their customers receive reliable electric service at reasonable rates.

3. Load Management

The goal of energy resource planning and operations is to reliably match supply of energy with demand for energy. Many of the representatives spoke to energy supply management, but demand-side management also can be used to balance supply and demand. All of the electric and natural gas utilities offer demand response programs.

For example, Entergy offers a Smart Direct Load Control Pilot Program as part of its energy efficiency programs. The program allows customers to opt in to a programmable thermostat that the utility company can adjust by a few degrees to reduce load during summer peaks between June 1 and September 30 each year. In exchange for the utility company's ability to perform this service, customers get a free smart thermostat, which can save them money by reducing heating and cooling when no one is home, and an annual enrollment incentive to encourage continued participation.

Interruptible tariffs also provide a mechanism for load management. AEEC testified that many industrial and agricultural customers take electric services on interruptible tariffs. An interruptible tariff makes the customer subject to curtailment in the event of a utility's peak load exceeding the available capacity. In exchange, these customers receive a discount on rates. Curtailment for customers on interruptible tariffs helped reduce the need for load shedding during the February 2021 winter weather event.

PSC Chairman Ted Thomas suggested further exploration of demand response and ensuring that demand response programs create appropriate price signals to incentivize consumers to voluntarily reduce load when needed. Demand response can also be used to address the intermittent nature of many of the renewable generation assets that are being brought online by matching intermittent supply with intermittent demand. PSC has an open proceeding to consider existing and planned demand response offerings by the electric utilities in Arkansas. The open PSC proceeding provides an open forum to address demand response programs in Arkansas.

V. RECOMMENDED ACTIONS TO ENSURE ADEQUATE SUPPLY OF CRITICAL ENERGY SOURCES DURING EXTREME EVENTS

A. Creation of an "Energy Resources Council"

The Task Force recommends creating an "Energy Resources Council." The Energy Resources Council would meet at least once annually to facilitate technical and policy discussion among regulators and energy stakeholders and would work to develop and maintain educational materials on best practices regarding preparation and communication in advance of and during events that may disrupt supply of critical energy resources. The list below provides recommended potential organizations for the Governor to nominate as Energy Resources Council members:

- Representative(s) from E&E;
- Representative(s) from Commerce;
- Representative(s) from PSC;
- Representative(s) from the Arkansas Attorney General's Office
- Representative(s) from electric and gas utility companies;
- Representative(s) from the Natural Gas and LP-Gas industry;
- Representative(s) from the MISO and SPP; and
- Representative(s) from community and business organizations, such as the Arkansas State Chamber of Commerce, AF&PC, AEEC, and AGC.

The Task Force also recommends that E&E host educational materials developed by the Energy Resources Council on its website and coordinate logistics for the annual meetings. Further, the Task Force recommends that RTOs, APSC, and utilities share with the Energy Resources Council any reports or other publications that quantify the outcomes of efforts these entities are undertaking to address lessons learned during the February 2021 winter weather event.

B. Creation of an "Energy Disruption Preparedness" Tool Kit

The Task Force recommends creating a webpage to serve as a central research location for information related to energy resources in the state. This central location would provide access links to the various utility companies and expert groups and provide a tool kit for best practices for preparedness for potential energy disruption events. E&E would host the tool kit and coordinate discussions with the energy industry participants on content and updates to the tool kit. This coordination would occur in conjunction with the proposed Energy Resources Council or in some other forum.

Examples of tool kit contents might include:

- Best Practices for Preparing A Business' Operation for a Potential Energy Disruption
  - Creating a facility-specific plan including consideration of:
    - Whether back-up fuel or generation is necessary;
    - What are minimum energy or fuel requirements to protect equipment from damage;
    - What level of energy or fuel, if any, is necessary to sustain human needs functions;
    - Who is responsible for making decisions to voluntarily curtail operations to conserve energy and reduce exposure to price surges;
    - Whether a human needs or plant protection affidavit should be filed with the energy supplier;
  - Electric and natural gas utilities that take service from interstate natural gas pipeline companies should submit a human needs affidavit for their operation pursuant to the pipeline company's FERC tariff:
    - Educational materials about what a human needs affidavit is and why it is important to keep a human needs affidavit on file if a portion of an energy provider's operations serve human needs;
    - Links to relevant FERC tariffs that establish the legal foundation;
  - Ensuring fuel and electricity suppliers and utilities know who to contact in the event of an energy disruption event;

- Best Practices for Communication in Advance of and During an Energy Disruption Event:
  - Implement a regular, periodic review by utility companies of the appropriate contacts for customers that may be curtailed during an energy disruption event;
  - Identify customers and ensure up-to-date contact information for each circuit so that the appropriate customers can potentially be notified promptly after a decision is made about a planned outage that is necessary for the stability of the grid;
  - Create a list of the call center numbers and other applicable contacts for each utility company so that state agencies can refer citizens to this list if there are concerns during an energy disruption event;
  - Review procedures and protocols for advance warning of service interruptions for customers served on interruptible rate schedules, coordinated outages, or other energy curtailments;
  - Reach out to PSC, E&E, Commerce, and prominent community business organizations to amplify the message to conserve energy when needed;
  - Include in-messaging implications of an energy disruptive event, such as the potential for outages and any associated price increases;

- Information about energy pricing (links or embedded tools):
  - Daily Natural Gas Spot Prices: https://fred.stlouisfed.org/series/DHHNGSP#;
  - MISO Locational Marginal Price Data: https://www.misoenergy.org/markets-and-operations/real-time--market-data/real-time-displays/;
  - SPP Price Contour Map: https://pricecontourmap.spp.org/pricecontourmap/; and
  - Best practices for ensuring that energy contracts provide for notification of price spikes, opportunities for voluntary curtailment and to direct customers to the public sources for wholesale electricity prices and natural gas prices so customers can monitor the prices and adjust their consumption accordingly.

The Task Force recommends sending out social media, press releases, and other methods of disseminating the availability of the tool kit once it is launched and at least twice a year each year thereafter in advance of the summer and winter seasons. The Task Force also recommends disseminating information about the availability of the tool kit when extreme weather events are forecasted.

C. Areas for Additional Consideration and Study

The Task Force notes that there are other items that may warrant further consideration within the appropriate existing forums, where they exist, to continue monitoring whether any additional actions may be appropriate. The following are potential areas identified by the Task Force upon reviewing testimony received. However, before taking actions under one or more of the following, the Task Force recommends a robust evaluation of the anticipated ratepayer impacts, environmental impacts, reliability impacts, and economy-wide impacts of any action.

1. The Task Force recommends that PSC continue its examination of demand-response programs in Arkansas and evaluation of whether it is in the best interest of Arkansas customers to expand those programs. The Tasks Force suggests that PSC consider whether it would be beneficial to expand the demand-response programs that are included in electric and natural gas utility rate schedules and financial incentives to customers for the widespread installation of demand-response technology for air conditioning, heating, and water heaters above and beyond the measures included in current utility company energy efficiency plans. Alternatively, or in addition, the Task Force recommends that the Energy Office within E&E consider whether it is beneficial to provide rebates for installation of demand-response equipment if state or federal funding becomes available. In addition to considering the potential for providing incentives to invest in demand-response technology, the Task Force recommends that PSC and E&E consider producing and distributing educational materials on the value of demand response for both reliability and cost-savings.

2. The Task Force recommends that PSC, the MISO and SPP RTOs, and E&E's Arkansas Oil and Gas Commission evaluate whether it is reasonable and cost effective to develop

standard criteria for weatherization of natural gas supply infrastructure and electric generation infrastructure in Arkansas. As part of PSC's resource planning process, a continued evaluation of the investments is needed to ensure adequate electric and natural gas supplies are available in Arkansas. The Task force recommends exploring potential opportunities to coordinate with Oklahoma, Texas, and the private sector to identify key components of the electrical, natural gas, and LP-Gas supply system that need protection from extreme cold and to examine whether there are cost effective opportunities to implement weatherization of these components. The Task Force recognizes that it will be beneficial to take advantage of the established procedures of PSC, MISO and SPP RTOs, and other state entities to pursue these evaluations.

3. The Task Force recommends the evaluation of investments in electric generation, including back-up generation, transportation, transmission, distribution, and storage assets that improve the reliability of Arkansas's electric infrastructure. This evaluation can be accomplished through the existing PSC and MISO and SPP RTO processes. The PSC's resource planning proceedings provide an open forum to consider the resource plans of the electric utilities. Further, individual utility proceedings to obtain approval of specific generation investments are also public opportunities to evaluate planned investments.

   Continued participation by PSC and other Arkansas stakeholders in RTO stakeholder processes provides value to Arkansas energy customers at no additional cost. The RTO stakeholder process ensures a rigorous evaluation of how to address reliability needs at the least cost. The RTOs have already begun implementing their lessons learned, including: evaluations of transmission gaps, changing to a seasonal construct for resource adequacy planning and capacity accreditation, and other measures for improving reliability.

4. The Task Force recommends that Arkansas's congressional delegation remain engaged in national policy discussions with respect to future tax credits for energy resources. Currently, there are investment tax credits for solar generation and production tax credits for wind generation. Congress should evaluate whether there are opportunities to provide incentives, such as tax credits, for the development and scaling of novel generation and storage technologies. The Task Force recommends working with Arkansas's Congressional delegation to evaluate whether changes to energy tax credits are appropriate and to encourage development of legislation to implement any changes determined appropriate.

5. The Task Force recommends that PSC, RTOs, E&E's Arkansas Oil and Gas Commission, and the LP-Gas Board consider whether it would be appropriate to implement any incentives for measures that could improve reliability in the form of financial incentives, formal recognition, expedited permitting, new rate structures and service offerings, or waiver of fees. The Task Force recommends evaluating whether it is technically feasible and cost effective to implement incentives for one or more of the following measures that could improve the reliability of Arkansas and regional energy

infrastructure:

- Transmission upgrades and expansion, particularly in load pockets and at RTO seams;
- Increased deployment of energy storage technologies, such as pump storage and battery storage;
- Increased deployment of back-up generation or dual-fuel generation that is capable of using a different fuel, such as diesel, LP-Gas, or liquefied natural gas, instead of the primary fuel used for generation;
- Addition of strategically-placed supply pulling points for LP-Gas, including pipeline terminals, rail terminals, and transloading facilities;
- Addition of natural gas storage facilities; and
- Addition of retail storage for LP-Gas.

The Task Force suggests that evaluating implementation of incentives for the electric energy infrastructure can and should occur as part of the established PSC resource planning process and the established processes of the MISO and SPP RTOs. Meetings of the proposed Energy Resources Council could serve as a forum for sharing ideas with respect to best practices for resource planning among electricity, natural gas, and LP-gas industry representatives and regulators.

6. The Task Force recommends that E&E evaluate whether it is reasonable and cost effective to expand current recognition programs to include reliability similar to the Arkansas Energy and Environment Stewardship Award ("ENVY"), the Arkansas Energy and Environment Technology Award ("TECHe"), the Energy Excellence Award ("E2"), and Quest Science Award that E&E uses to highlight what Arkansas companies are doing in the areas of sustainability, innovative technology, and energy and environmental stewardship.[4]
7. The Task Force recommends that the LP-Gas Board examine whether it is technically feasible and cost effective to expedite inspections of new retail and terminal-level LP-Gas storage and waive fees to promote the addition of LP-Gas storage, pipeline terminals, rail terminals, and transloading facilities.
8. The Task Force recommends that E&E's Arkansas Oil & Gas Commission coordinate with the Arkansas Geological Survey and representatives from the natural gas producers and natural gas utilities to evaluate whether there are any additional geological formations or existing abandoned gas fields in the state capable of storing natural gas or propane. If additional sites suitable for storage are identified, the Task Force recommends that the state work with stakeholders to evaluate the technical and economic feasibility of incorporating the sites into Arkansas's energy infrastructure.

[4] https://www.adeq.state.ar.us/poa/enterprise-services/awards/

9. The Task Force recommends that the appropriate stakeholders evaluate whether there are any additions or revisions to Arkansas statutes to help promote investments and assist in providing reliable energy resources for the state in the future. The stakeholders should evaluate whether any state policy could be enacted through legislation or adopted under state agency rules if authorizing legislation already exists.

10. The Task Force recommends that the Arkansas Department of Transportation coordinate with E&E, PSC, utility companies, and county and local governments to identify priority routes for delivering diesel fuel used for backup generation and propane used for heat. The stakeholders should evaluate whether it would be beneficial to develop a communications protocol to determine whether these routes should be among the first cleared during winter weather events that threaten to disrupt energy supply and delivery. The coordinated effort should include development of a plan for ensuring that the identified routes are kept clear during an energy disruption event.

11. The Task Force recommends that PSC coordinate with the electric and natural gas utility companies to ensure that there are appropriate and adequate communications plans to notify customers of potential coordinated outages or other interruptions of service during weather events. Further, PSC should coordinate with the utility companies to determine whether it is necessary to develop communications advising customers of potential prices increases caused by weather events, including consideration of the costs of developing such communications and notifications.

12. The Task Force also recommends that PSC evaluate its rules and tariffs and consider whether it is reasonable and necessary to require utility companies to notify a customer of an impending curtailment so that the customer may take steps to protect equipment and plan for changes to its operations during the curtailment, including evaluation of the costs and feasibility of such procedures, and if the procedures implemented by the utilities are sufficient.

13. The Task Force recommends that the appropriate stakeholders consider whether Arkansas should implement policies to extend the human needs-based system for prioritization of natural gas and electricity to all energy resources, including LP-Gas. If outages are necessary to ensure the reliability of the electricity grid or curtailment is necessary due to limited fuel supply or other weather-related electric infrastructure outages, the Task Force recommends that the stakeholders consider what steps are necessary to establish procedures for prioritizing energy to occupied dwellings, natural gas-fired electric generation to serve human needs customers, food supply production, and other commercial and industrial facilities whose operations are necessary to preserve human life, health, and safety, including whether any executive, administrative, regulatory, or legislative action may be required. The stakeholders should also consider what steps are necessary to establish the procedures necessary, after ensuring energy resources are adequate to sustain human needs, to ensure that adequate supplies of energy to businesses and industry that would otherwise suffer damage to equipment or severe economic harm are prioritized.

14. The Task Force recognizes that there may be limited opportunities for prioritization of energy resources for human needs under state authority. However, the Task Force recommends that the appropriate stakeholders evaluate whether it would be appropriate to implement legislation in Arkansas similar to the Louisiana statute that establishes an Emergency Gas Allocation Plan (see Louisiana Code Title 43, Part XI, Subpart 1, Section 143). Implementation of a state law of that nature may assist human needs customers during emergency situations like the February 2021 winter storm event. It may be appropriate to consider opportunities to coordinate with the state's federal delegation to identify opportunities for state and federal regulatory authorities coordination to determine whether to implement new rules or revise existing rules to implement prioritization of human needs. Examples of rules for consideration include requiring prioritization of fuels used for energy to meet human needs, such as LP-Gas and natural gas, in pipeline allocations over other pipeline products. The state and federal regulatory authorities might also consider whether it should be permissible for pipelines to limit allocations on the pipeline for fuels used to support human needs based on nominations during the summer, when less fuel is needed.
15. Pursuant to the Arkansas Emergency Petroleum Set-Aside Act, Ark. Code Ann. § 15-72-801 *et seq*., the Arkansas Energy Office has promulgated rules and regulations for the implementation and operation of the Arkansas state set-aside program. However, the implementation of this program is commenced when the Governor, in his discretion, finds that the program is necessary to manage a shortage of specified petroleum products which threatens the continuation of emergency services and essential industrial or agricultural activities. While the Task Force recognizes that this set-aside program was not applicable during the February 2021 winter weather event, this program may be a resource that could help with energy resource shortage events should they occur in the future. The Task Force believes further discussion of the set-aside program may be warranted in development of implementation priorities.

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