UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Climate Change, Extreme Weather, and Electric System Reliability	**)** **)**	**Docket No. AD21-13-000**

COMMENTS OF BUCKEYE POWER, INC.

Pursuant to the Commission's March 15, 2021, supplemental notice inviting comments on the upcoming technical conference in this docket to discuss issues surrounding the threat to electric system reliability posed by climate change and extreme weather events,[1] Buckeye Power, Inc. ("Buckeye") submits these comments.

I. SUMMARY OF BUCKEYE'S COMMENTS

As the grid undergoes a transformation towards decarbonization, it is at increasing risk of becoming less reliable[2] and less affordable[3] for consumers. It cannot be assumed that decarbonization efforts, even if successful, will necessarily eliminate extreme weather events, which have existed historically even in the absence of anthropogenic effects on the climate. Grid

[1] *Climate Change, Extreme Weather, and Electric System Reliability*, Supplemental Notice of Technical Conference Inviting Comments, Docket No. AD21-13-000 (Mar. 15, 2021) ("Supplemental Notice").

[2] Reliability of the electric grid is important for several reasons essential to the well-being of the nation in general. It will be difficult for other economic sectors (such as those pertaining to food, water, shelter, transportation, and healthcare) to decarbonize effectively and move to greater electrification without grid reliability, and because such other sectors of the economy are also dependent on a reliable electric grid to help cope with the effects of climate change.

[3] Affordability is important because customer income and resources will be needed for other sectors of the economy, such as food, water, shelter, transportation, and healthcare, which are also necessary to cope with the effects of climate change, and because such income and resources will also be needed to cope with societal problems other than climate change.

reliability and affordability must, therefore, be maintained at all times before, during, and after decarbonization efforts.

Current wholesale electricity market constructs are lagging the pace of this grid transformation and are making it more difficult for decarbonization goals to be achieved while maintaining reliability and affordability, particularly during extreme weather events. This is extremely troubling to Buckeye, whose primary mission is to provide reliable and affordable power to its member cooperatives, and in turn, their member-consumers. Addressing these concerns in its comments, Buckeye:

- explains why existing market constructs should be modified to compensate generation resources for reliability attributes that are otherwise not recognized and why higher reliability standards should be imposed;

- emphasizes the need for immediate action to prevent controllable, dispatchable, fuel-secure thermal generation from being retired prematurely resulting in decreased reliability and increased costs for consumers;

- maintains that a diverse resource portfolio that includes fuel-secure thermal resources must be maintained and may need to be located within each RTO/ISO;

- explains why there will need to be sufficient time for the electric industry to adapt to infrastructure changes that reflect planning horizons realistically in order not to jeopardize service reliability and affordability;

- describes why better coordination between electric and gas industries involving pipeline usage and natural gas demand is essential because of the growing dependence on natural gas generation and the increased likelihood of extreme winter weather events; and

- stresses that in the longer-term, grid reliability and affordability must be maintained from existing resources, including fuel-secure thermal resources, until new technology develops that will allow decarbonization of the electric sector (in whatever form that takes) and other sectors of the economy to occur on a reliable and affordable basis.

II. BACKGROUND

Buckeye is an Ohio non-profit corporation and generation and transmission cooperative that produces, procures, and provides at wholesale all the electric capacity and energy required by its 25 member electric distribution cooperatives operating in Ohio.[4] Buckeye operates as a cooperative and is owned by its 25 member distribution cooperatives, which are in turn each owned by their member-consumers. Buckeye thus operates not for the benefit of shareholders, but for the benefit of its members-consumers. Buckeye's mission is to provide "to all member systems, stably and competitively priced, economical and highly reliable wholesale power, for the benefit of their members and their communities."[5]

Buckeye and its affiliates own or control power generation resources with nameplate capacity totaling approximately 2,400 megawatts. Buckeye's generation resources include coal plants, natural gas peaking facilities, hydropower allocations, solar and other renewable facilities. Buckeye's member cooperatives serve approximately 400,000 residential, commercial and industrial customers in service territories encompassing 77 of Ohio's 88 counties. Buckeye is a member of PJM Interconnection, L.L.C. ("PJM"), and Buckeye sells its generation into the PJM market and purchases the energy and capacity needs of its members from the PJM market.

[4] The 25 distribution cooperative members of Buckeye are: Adams Rural Electric Cooperative, Inc.; Buckeye Rural Electric Cooperative, Inc.; Butler Rural Electric Cooperative, Inc.; Carroll Electric Cooperative, Inc.; Consolidated Cooperative, Inc.; Darke Rural Electric Cooperative, Inc.; Firelands Electric Cooperative, Inc.; The Frontier Power Company; Guernsey-Muskingum Electric Cooperative, Inc.; Hancock-Wood Electric Cooperative, Inc.; Holmes-Wayne Electric Cooperative, Inc.; Licking Rural Electrification, Inc.; Logan County Cooperative Power and Light Association, Inc.; Lorain-Medina Rural Electric Cooperative, Inc.; Mid-Ohio Energy Cooperative, Inc.; Midwest Electric, Inc.; Midwest Energy & Communications; North Central Electric Cooperative, Inc.; North Western Electric Cooperative, Inc.; Paulding-Putnam Electric Cooperative, Inc.; Pioneer Rural Electric Cooperative, Inc.; South Central Power Company; Tricounty Rural Electric Cooperative, Inc.; Union Rural Electric Cooperative, Inc.; and Washington Electric Cooperative, Inc.

[5] Buckeye's mission statement can be found on its website at https://ohioec.org/buckeye-power (accessed April 12, 2021).

Buckeye has maintained a mix of energy resources that, in combination with the PJM market, ensures reliability and stable pricing for the end-use consumers in the service territories of Ohio's electric cooperatives.

Buckeye operates in a marketplace that is increasingly dependent on and affected by facilities, power supplies and policies that go beyond Buckeye's and its members' individual system operations and choices. The technical conference and the issues in this docket center on "the threat to electric system reliability posed by climate change and extreme weather events."[6] Buckeye welcomes the opportunity to address these important issues. Buckeye comments on several of the concerns raised by the Commission in this docket that have the potential for the greatest impact on its and its members' systems and operations, referencing the numbering and ordering contained in the appendix to the Supplemental Notice.

III. COMMENTS

1. *What are the most significant near-, medium-, and long-term challenges posed to electric system reliability due to climate change and extreme weather events?*

Ensuring reliable and affordable electricity to consumers in the face of extreme weather events and a rapidly changing generation mix is imperative for those responsible for planning and managing the electric grid.[7] Weather-related events this past year in wide regions of the United States that led to significant disruption of electric service are only the most recent reminders of the difficulties the nation faces in ensuring that power service is reliably available. New demands are being placed on the electric grid as it undergoes a dramatic transformation. Decarbonization of

[6] Supplemental Notice at P 1.

[7] A distinction should be drawn between "electric system reliability" as it relates to local delivery reliability and reliability of the broader grid. Local delivery reliability is primarily a distribution level concern and is generally better left to local decision making than to broad federal oversight. In these comments, Buckeye is referring to the reliability concerns involving the broader grid.

other sectors of the economy, particularly the transportation sector, will lead to increased electrification and amplify stresses on the grid. At the same time that demand is increasing, historically reliable generation resources supporting the grid, such as coal and nuclear facilities, are exiting the market in ever-increasing numbers and being replaced by intermittent renewable resources and load-following generation facilities reliant on "just-in-time" fuel delivery.

It should be recognized that it may not be possible to decarbonize the electric generation and transportation sectors fully while maintaining grid resiliency and affordability, at least in the short- and medium-term, unless existing fuel-secure fossil fuel and other thermal resources remain in service. However, substantial progress towards decarbonization can still be achieved. While new technologies, such as battery storage and small scale nuclear, are developed to allow for full decarbonization that can provide reliable electric service on an economical basis, fuel-secure fossil fuel and other thermal resources are needed to meet peak demands during extreme weather events at affordable prices. Failure to maintain larger, utility-scale fuel-secure thermal resources during this transition may lead to a situation where smaller, less efficient, and more carbon emitting resources, such as on-site diesel generators, are needed to maintain reliability during peak load and extreme weather events when intermittent resources may not be available.[8] Such an outcome would potentially nullify decarbonization progress achieved during normal/non-emergency operations of intermittent resources.

[8] For example, during the blackouts that occurred in the CAISO in August of 2020, California Governor Gavin Newsome issued an emergency decree that allowed some customers and utilities to rely on diesel generators to provide back-up electricity and relieve pressure on the grid. Michael Lustig, "California ISO warns of more blackouts as governor declares emergency", S&P Global (August 17, 2020), available at https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/california-iso-warns-of-more-blackouts-as-governor-declares-emergency-59960783 accessed April 12, 2021. Even in the CAISO's Final Root Cause Analysis of the event, the CAISO's near-term contingency plan includes "emergency use of diesel generation that the three large electric IOUs own or have under contract. . . ." See Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave (Jan. 13, 2021), p. 73, available at http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf April 12, 2021.

As the electric grid transforms to meet the expectations of consumers and the demands of the marketplace, it is critical that the resiliency, reliability, and affordability of electric service is maintained. Unless a proper balance between resource adequacy and affordability can be struck, the benefits of decarbonizing the grid to address climate change and extreme weather events, however well-intended, can lead to harmful or even catastrophic missteps and unintended consequences.

Buckeye recognizes the importance of the Commission's desire to address threats to electric system reliability posed by climate change and extreme weather events. However, it cannot be assumed that decarbonization efforts, even if successful, will eliminate the impacts of climate change and extreme weather events entirely. Therefore, it is important that the grid maintain resiliency at all times before, during and after decarbonization efforts. Efforts to decarbonize the electric grid should not compromise grid resiliency or the affordability of electric service to all.

These concerns are fundamental to electric service over the nation's grid and present unique challenges in the near-, medium- and long-term.[9] Successful decarbonization of the grid under all circumstances, requires careful planning and that orderly change and necessary safeguards are in place to ensure demand can be met reliably and so that "lights are kept on" at an affordable cost.

Near-term

A vital near-term goal should be to maintain a reliable mix of generation resources and resilient transmission facilities to ensure the electric system can respond to extreme weather

[9] As far as the time frames discussed in these Comments, for "short-term," Buckeye is considering the time period through 2035; for "medium-term," from 2035 through 2050; and for "long-term," for the period after 2050.

events. Recent extreme weather events in Texas and California over the past twelve months have vividly shown that the current mix of resources and market constructs are sometimes inadequate to provide the resiliency and reliability that is needed. Immediate steps should be taken to ensure that reliability can be met through a diverse portfolio of controllable, dispatchable, fuel-secure, and affordable generating resources. To accomplish this, improved planning and compensation arrangements are needed for a range of reliable thermal resources to remain operational.

Another near-term goal benefiting the electric grid should be to impose higher reliability standards to plan for extreme weather events. PJM's current resource adequacy process is based on a Loss of Load Expectation (LOLE) of on average, 1 day in 10 years (or 0.1 days per year).[10] PJM uses this reliability index to determine appropriate Installed Reserve Margin,[11] a critical component of reliability. This existing standard may be inadequate to address extreme weather events, and a higher standard of electric reliability, such as 1 day in 25 years, should be considered.

In addition, new planning criteria for resource adequacy should be developed that expressly address extreme weather events and other unusual scenarios that can threaten reliability. RTOs/ISOs should conduct further analyses as may be needed to determine whether the existing grid and market structure has the necessary resiliency and reliability. Planning should consider extreme circumstances and rare events, such as severe cold weather effects on wind resources and on gas supply availability that could lead to difficult choices in prioritizing service interruptions, as well as the effects of sustained high temperatures on electric systems. If an examination of these scenarios demonstrates that certain attributes are helpful or necessary to maintain grid

[10] PJM Manual 20, page 13.

[11] Calculated as the installed capacity percentage above the forecasted peak load required to satisfy LOLE. *Id.*

reliability that might require greater stockpiles of on-site fuel and improved inertia and frequency responses, for example, it will be necessary to assess the costs and design a fair market construct to compensate for these changes and improvements. It is possible that procuring adequate capacity for extreme events may result in some capacity being rarely used—but this capacity must nevertheless be adequately compensated to remain in service, and this is a necessary cost for a reliable electric system. As demonstrated recently, being unprepared for extreme weather and unusual events that can disrupt electric service, even if rare, can lead to catastrophic results that go beyond economic losses and can include loss of lives.

To plan effectively for extreme events in the long-term, an increase in excess *reliable* capacity will be needed in the near-term. This excess reliable capacity must be controllable, dispatchable and have adequate fuel security. Each additional megawatt of capacity in the market does not have the same resource adequacy and should not be treated the same. Recent events have shown that the increased reliance on intermittent renewable resources, like solar and wind, and resources that rely on just-in-time fuel delivery, like natural gas plants, present serious reliability concerns in extreme weather events.

Regulators cannot ignore the fact that federal and state policy decisions and subsidies as well as established RTO/ISO market constructs have put increasing financial pressure on facilities that have historically provided reliable and flexible fuel-secure generation. The lack of adequate compensation in the existing market constructs for these resources has caused many flexible fuel-secure generating plants to retire prematurely. In the near-term, market structure designs should be implemented to provide adequate financial compensation for reserve generation resources that may only be needed during extreme events (weather or other) in order to prevent premature

retirement of controllable generation resources that are better able to respond to changing system conditions than other alternatives currently available.

In the near-term, the greatest challenges are to ensure that reliable resources continue to operate and are adequately compensated in the marketplace. This will require a reexamination of planning criteria to address extreme upset events and to provide adequate compensation for needed facilities and improvements as the grid undergoes significant changes. To accomplish this, reliability standards and long-term planning must improve, and adequate compensation for dispatchable resources that provide supply security must be assured.

Medium-term

In the medium-term, there needs to be sufficient time for the electric industry to adapt to infrastructure changes required to meet reliability concerns. Even if the electric industry knows today what steps need to be taken to improve reliability, these actions have real-world, practical timelines that must be considered and realistically reflected in planning horizons. For example, if it is determined that additional weatherization should be installed on power plants or more (or less) coal or nuclear baseload should be built or retired, these resource changes require significant amounts of time and planning before they can be implemented. Studies may need to be conducted, permits obtained, goods and services procured, equipment manufactured, delivered, and installed. Construction of a nuclear plant alone can take 15 years or more. Whatever steps are determined are necessary to change the resource mix of the grid, including the desired speed of decarbonization, the industry must be given adequate response time to adapt so as not to jeopardize service reliability.

Another medium-term concern is improved electric and gas coordination. With the growing dependence on natural gas generation and the increased likelihood of extreme winter

weather events, better coordination between electric and gas industries involving pipeline usage and natural gas demand is essential. RTOs/ISOs with the support of the Commission should encourage meaningful stakeholder discussions between the two industries. Priority allocations and transportation of gas supply to power plants in extreme cold or other constrained gas supply events must be addressed. This may require infrastructure updates to the electric system and to natural gas transmission and storage operations to keep pace with increasing electric demands and changing generation resources. But even if improvements are made to provide better electric/gas coordination, this will not be a substitute for generation resources with fuel on-site, which are uniquely capable of providing superior operational reliability during extreme weather events.

Long-term

A longer-term challenge surrounds the time needed for technology development to enable decarbonization of the electric sector (in whatever form that takes) and other sectors of the economy while maintaining necessary grid reliability and affordability. Technologies necessary to support decarbonization of the electric sector, such as economic carbon capture systems or large-scale batteries that can provide grid-level backup, require sufficient lead-times to be developed and implemented. While the medium- and long-term challenges of developing the technology to decarbonize the grid, maintain reliability, and build the supporting infrastructure are met, in the near-term, a diverse set of generation resources must remain in service to ensure continued reliability of today's grid.

Policy and decision makers alike should commit to the foundational principle that a reliable grid must be maintained for the benefit of *all* users at an affordable cost. Decarbonization through new technologies cannot create a system where only the well-off can afford reliable energy, say,

through the purchase of on-site back-up generators and on-site battery storage. Costs and benefits associated with the decarbonization transition must be analyzed accurately and honestly.

4. *What are the electric system reliability challenges associated with "common mode failures" where, due to a climate change or extreme weather event, a large number of facilities critical to electric reliability . . . experience outages or significant operation limitations, either simultaneously or in close succession? How do these challenges differ across types of generation resources…? To what extent does geographic diversity … mitigate the risk of common mode failures?*

Maintaining a diverse mix of generation resources within each RTO/ISO is essential to ensuring a reliable electric grid, particularly during extreme weather events. Recent events in California, Texas, and other regions of the country have demonstrated that reliance on a limited set of generation resources, such as intermittent renewable and natural gas generation resources, can result in a dangerous lack of reliability in extreme conditions.

In Texas this past winter, for instance, wind and solar power resources were unavailable (either due to extreme cold, lack of wind, or the sun being down) and natural gas plants failed to operate and generate needed power due to constraints in the just-in-time delivery of natural gas. In such circumstances, controllable generation with on-site fuel sources, such as coal and nuclear generating facilities, would have provided the necessary resilience to maintain power service. Problematically, however, many of these resources were, and are continuing to be, retired prematurely due to current market constructs and a lack of state and federal support.

In PJM alone, since 2007, more than 33,000 MW of coal generation has retired while 40,000 MW of new natural gas resources and 12,700 MW of wind and solar entered the market.[12] And this trend is continuing: PJM recently noted that "[c]urrently, 92% of the 145 gigawatts in

[12] Statement of PJM Interconnection, *FERC: Technical Conference on Resource Adequacy in the Evolving Electricity Sector* (Mar. 23, 2021), p. 3.

the PJM interconnection queue – where generation projects apply to connect to the PJM system – are solar, wind, storage or combinations of wind/solar with storage resources, known as hybrids."[13] Increased reserve margins of renewable energy and natural gas may meet some reserve margin requirements, but they cannot create the same reliability that fuel-secure resources like nuclear and coal generating plants provide. Particularly in the context of extreme weather events, historical and recent experience confirms that fuel security is critical to reliability and that each additional megawatt of capacity does not provide an equal measure of resiliency.

While geographic diversity may help in some circumstances, extreme weather events often affect large geographic areas. Reliance on resources outside a geographic zone or from another RTO/ISO is no panacea; indeed, it can provide a false-sense of security and create its own reliability risks. This issue was clearly seen in the CAISO blackouts that occurred in the summer of 2020. At that time, the CAISO could not meet its power needs because it was dependent on supply imports from neighboring states that became unavailable due to a wide-spread heat wave. These events teach that not only is a diverse resource portfolio necessary, but it may need to be located within the RTO/ISO itself. In simple terms, everyone cannot be relying on someone else's resource exports for their own reliability.

6. *How are the relevant regulatory authorities . . ., individual utilities…., and regional authorities… evaluating and addressing challenges posed to electric system reliability due to climate change and extreme weather events and what potential future actions are they considering? What additional steps should be considered to ensure electric system reliability?*

15. *What actions should the Commission consider to help achieve the electric system that can better withstand, respond to, and recover from climate change and extreme weather events? In particular, are there changes to ratemaking practices or market design that the Commission should consider?*

[13] Reliability in PJM: Today and Tomorrow, PJM Interconnection (Mar. 11, 2021), p. 1.

As discussed above, Buckeye maintains that higher reliability standards and better planning for extreme weather and other unusual upset events should be implemented. In addition, a diverse resource portfolio is necessary to maintain reliability in these circumstances. The existing RTO/ISO market constructs need to ensure reliable resources are adequately compensated and do not retire prematurely.

The RTO/ISOs, with the support of the Commission, should consider implementing market designs that compensate generation sources for the essential services they offer for a resilient and reliable electric grid, such as by providing:

- compensation for being "always on" or stand-by compensation for sources that cannot come online and offline quickly but are required to stay online to handle the day-to-day volatility of renewable resources;
- "ramp" product compensation for assets that "follow load" or provide needed energy-ramp capability;
- fuel security compensation for resources that have fuel on-site and do not rely on just-in-time delivery of fuel sources;
- compensation for inertial and primary frequency responses; and
- compensation for capacity that must be procured because it is crucial to avoid service interruptions during extreme events even though some of the capacity may rarely be used.

RTOs/ISOs should also consider a longer-term focus for capacity resources by implementing auctions that are more than three years in advance or have a longer than one-year commitment term. The existing capacity markets do not adequately recognize or compensate the long-term nature of generation resources. This change would recognize the timeline for entry of a diverse mix of generation resources into the market while also ensuring long-term compensation for long-term resources.

The current RTO/ISO markets and federal and state incentives have created winners and losers. Unfortunately, as recent events have demonstrated, the resources that have historically

provided reliable generation have not been the winners and are continuing to shut down prematurely thereby contributing to an increasing lack of reliability. This is an issue RTOs/ISOs are beginning to recognize as a serious problem.

PJM, ISO New England and New York ISO recently submitted joint "Foundational Market Objectives for a Reliable Future Grid" to the Commission for consideration as part of its March 23 Technical Conference entitled "Resource Adequacy in the Evolving Electricity Sector." The RTOs/ISOs laid out five market objectives to ensure a reliable system including "new services to ensure continued reliability" and "an accurate assessment of resource capacity contributions to

resource adequacy." Buckeye respectfully asks that the Commission consider the important issues and recommendations raised in these comments.

IV. CONCLUSION

WHEREFORE, Buckeye requests that the Commission give full consideration to these comments and concerns in connection with its examination of the issues surrounding the threat to electrical system reliability posed by climate change and extreme weather events.

Respectfully submitted,

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Its counsel

Dated: April 15, 2021

CERTIFICATE OF SERVICE

I hereby certify that on this 15th day of April 2021, I have caused a copy of the foregoing to be served upon each person on the official service list for this proceeding.

/s/ Marvin T. Griff