From: Bruner, Brandon S (PSC) on behalf of PSC Executive Director
To: [redacted]
Subject: America"s Power Public Comments Case No. 2021-00004
Date: Tuesday, August 17, 2021 2:35:00 PM
Attachments: Mitchell Plant Comments America"s Power - 8.16.2021 FINAL.pdf
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Thank you for your comments on the application of Kentucky Power Company. Your comments in the above-referenced matter have been received and will be placed into the case file for the Commission's consideration. Please cite the case number in this matter, 2021-00004, in any further correspondence. The documents in this case are available at View Case Filings for: 2021-00004 (ky.gov).

Thank you for your interest in this matter.

Best Regards,

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Subject: America's Power Public Comments Case No. 2021-00004

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America's Power would like to file these public comments in Case No. 2021-00004 - Kentucky Power Company.

Please include them in the public comment folder.

Michelle Bloodworth

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Public Comments of America's Power
Submitted to the Kentucky Public Service Commission

Case No. 2021-00004 – Kentucky Power Company
August 16, 2021

America's Power is pleased to offer comments on the Order issued by the Public Service Commission of Kentucky ("Commission") on July 15, 2021 in Case No. 2021-00004. The Order addressed the February 8, 2021 Application for Certificate of Public Convenience and Necessity filed by Kentucky Power Company ("Kentucky Power"), a regulated electric utility and operating subsidiary of American Electric Power ("AEP"). America's Power is a national trade association representing coal-fueled electric power generation.

In the Order, the Commission approved the cost of compliance with the EPA's coal combustion residuals rule ("CCR") at the Mitchell power plant ("Mitchell") owned in part by Kentucky Power (and in whole by operating companies of AEP). This investment to comply with the CCR rule will allow the Mitchell plant to operate through 2028. The Order proceeded to disallow cost recovery of modifications that would permit Mitchell to comply with EPA's effluent limits guidelines ("ELG") and to continue operations to the end of its useful life in 2040. America's Power respectfully requests the Commission reconsider this decision and allow cost recovery of the modifications required to make Mitchell compliant with both rules.

In the Order, the Commission considered the direct cost to Kentucky Power and its ratepayers of modifying Mitchell to comply with EPA rules, or instead to replace its capacity in Kentucky Power's supply portfolio. Kentucky Power and other intervenors in this docket have offered competing financial analyses of the alternatives, but it is not the intent of America's Power to ask the Commission to revisit these calculations. Rather, it is our goal to explain some of the benefits provided by Mitchell to the state of Kentucky that have not yet been well addressed in this docket. Mitchell is a source of fuel-secure dispatchable generation that supports the reliability and resilience of the PJM electricity region, one of the few regional transmission organizations that has not recently experienced rolling blackouts. As the grid transitions to a higher share of renewable resources, Mitchell's continued operation guards PJM against the risk of

losing too much reliable generation too soon. For ratepayers, the power plant provides fuel diversity that helps shield the state against electricity price spikes that can result from volatile natural gas prices.

America's Power firmly believes that, to protect Kentucky ratepayers and the reliability and resilience of the state's electricity grid, the Commission should approve the steps required for Mitchell to comply with EPA rules and continue operating to the end of its useful life.

Kentucky is part of PJM and has an interest in a robust and reliable PJM grid

The PJM Interconnection is the regional transmission organization that operates the electricity grid across thirteen states, including much of Kentucky. Power generation and electricity demand are coordinated across the region, and Kentucky has a strong interest in ensuring this system is reliable and resilient. Coal-fueled power plants are unique in their ability to support reliability and resilience. They are fuel-secure, maintaining an average of four months of fuel on-site,[i] whereas natural gas generation typically relies on just-in-time deliveries from pipelines, and renewable wind and solar generation rely on favorable weather. Coal generation is dispatchable, meaning it can generate when it is needed and ramp down when it is not. Nuclear generation, while also fuel-secure, has difficulty varying its output; and wind and solar generation cannot be scheduled to meet demand on the system.

The value of coal generation to the reliability and resilience of the PJM system, particularly during extreme weather events, has been widely acknowledged. For example:

- Consulting company Quanta Technology found that under certain scenarios, "the PJM grid could be challenged with even a small amount of coal retirement, depending upon the location and amount, as well as the availability of fuel-secure gas-fired generation to replace the retired capacity."[ii]
- The National Energy Technology Laboratory (NETL) noted that coal generation was essential to keeping the lights on during the 2018 "bomb cyclone" winter storm, concluding that, "In review and retrospect, coal units in PJM were uniquely positioned to provide the resilience needed at this critical point in time."[iii]

- NERC, the regulatory body responsible for electric reliability nationwide, found that an accelerated retirement of coal generators, coupled with the high demand experienced during "polar vortex" storms, could leave PJM with insufficient resources to meet electricity demand.[iv]
- In recent Congressional testimony, PJM President and CEO Manu Asthana highlighted the important role of the coal fleet in PJM during this past winter's cold weather, stating, "In this recent cold snap, in PJM coal was about 32% of the generation… just from a fuel diversity perspective as a grid operator, I do think as we go through this transition it's really important to make sure that we can hold onto those dispatchable resources until we have something to fill the gap."[v]

PJM has not experienced any significant reliability-related outages in recent years, something that cannot be said of other electricity regions. As recently as February of this year, severe winter weather saw the ERCOT, SPP, and MISO regions forced to declare emergency conditions and shed load as electricity demand exceeded available power supply. ERCOT outages were particularly severe, with over four million customers losing power in a system failure that has been cited as contributing to deaths in the state. Each of these regions has seen a dramatic reduction in its share of capacity and generation provided by coal and other conventional power sources in favor of wind and solar generation. Yet when power was most needed during the February 15-18 extreme winter weather, the output of these resources dropped dramatically, as the following table shows. One of the reasons PJM has not experienced similar emergency conditions is that it does not yet rely heavily on wind and solar resources.

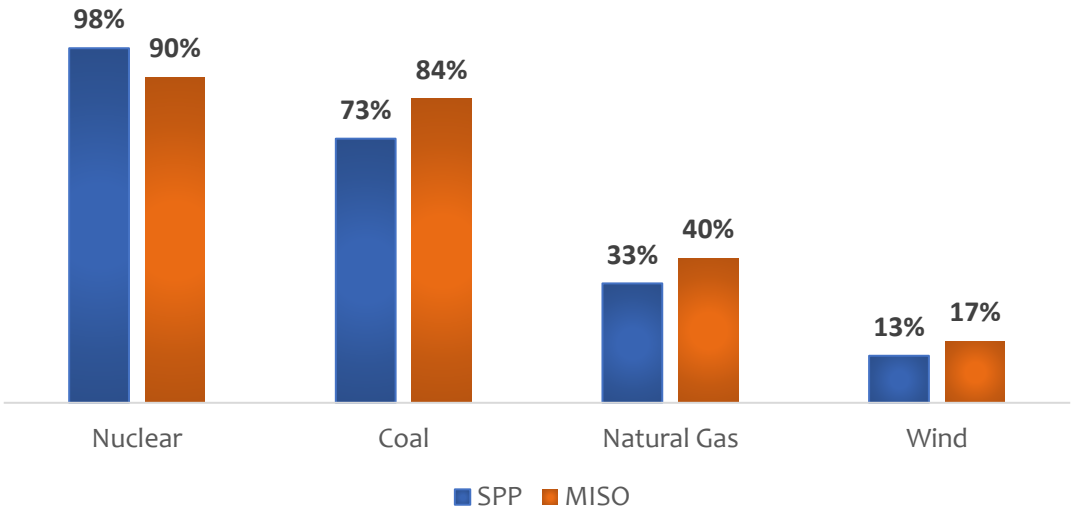
Share of generation met by wind and solar power[vi]

	2010	*2020*	*Feb. 15-18, 2021*
ERCOT	7.1%	17.6%	9.8%
MISO	3.9%	7.1%	5.1%
SPP	3.9%	22.7%	10.9%
PJM	1.0%	2.4%	2.5%

The value of coal generation during extreme weather events can be seen in how the fleet performs under such conditions. The chart below shows the capacity factors of generators by fuel type under the difficult conditions of February's storm, when all

generators that could provide power were needed to do so. Only nuclear power was able to respond at a higher rate than coal.

Capacity factors during February 15-18[vii]



California has also experienced reliability problems as it seeks to integrate increasing amounts of renewable generation, which now comprises 30 percent of the generating capacity managed by the California Independent System Operator (19 percent solar, 11 percent wind). Electricity supply shortages caused rolling blackouts for five days last August, with approximately two million people losing power.

Natural gas generation is not without risks either. Winter weather can freeze the distribution system, as happened in ERCOT in February.[viii] Pipelines can run out of capacity during periods of high demand, as happened during 2018's bomb cyclone (when coal generation was able to fill the gap and keep the lights on in PJM).[ix] Pipelines themselves are at risk of terrorism, as was clearly demonstrated by the recent cyberattack on the Colonial Pipeline that caused gasoline shortages in several eastern states. Commenting on the Colonial Pipeline attack, NERC President Jim Robb stated, "If this had happened to a major natural gas line serving electricity generators under extreme cold weather conditions, the results could have been catastrophic."[x]

The grid transition cannot occur as quickly as some wish

Nationwide and in PJM, the share of electric power generation provided by fossil fuels has been decreasing, with many calling for the pace of this grid transition to accelerate. The Biden administration has announced a goal of achieving carbon-free electricity by 2035. However, cost concerns, planning constraints, and lack of technology availability will make this timeline impossible to meet. Dispatchable fossil-fueled power plants like Mitchell will be needed to support the grid during its transition. They should not be discarded in anticipation of it.

The Electric Power Research Institute (EPRI) has conducted preliminary analysis of the costs associated with decarbonizing the grid by 2035.[xi] Their findings suggest how expensive such a process would be, including:

- The grid would need to add 900,000 megawatts (MW) of new wind and solar; 80,000 MW of new nuclear capacity; and 200,000 MW of hydrogen-fueled turbines.
- The cost for additional electric generating resources ($1.5 trillion) and transmission upgrades ($200 billion) would total $1.7 trillion over the period 2020-2035.
- The average price of electricity would almost double nationally by 2035 (increasing from $60/MWh now to $110/MWh in 2035).

In addition to cost concerns, completing the necessary transmission projects by 2035 will be virtually impossible because the process of identifying, permitting, and building new transmission lines is very time consuming. For example, the Transwest Express Transmission Line, a 700-mile, 3,000-MW capacity line intended to deliver wind power from Wyoming to Nevada and California began development in earnest in 2005, but final permits were not received until 2020. Construction has finally been scheduled to run from 2022 to 2024, nearly 20 years after the project began.[xii]

With little or no carbon-emitting generating resources available to balance the grid when the sun is not shining and the wind is not blowing, energy storage technology such as batteries must be deployed to store renewable generation. This technology is in its infancy, however, with only 1,300 MW of battery storage currently installed nationally.[xiii] Current cost estimates for the technology range from $132-$245 per MWh as well, making it cost-prohibitive for widespread deployment in the current state of the technology.[xiv]

Similarly, carbon capture, utilization, and storage (CCUS) technology could significantly reduce carbon emissions from dispatchable fossil-fuel power plants, but the technology is not yet cost-effective for widespread deployment. Efforts to improve both CCUS and battery storage continue to show promise, but it is risky to assume they will be cost-effective enough and widely deployed within 15 years.

Despite the cost and difficulty of decarbonizing electric generation, some states in PJM may attempt to accelerate the transition of their generating capacity to carbon-free renewable sources. Coal generating capacity in PJM has already declined substantially. Between 2010 and 2020, coal-fueled generating capacity in PJM dropped from 80,000 MW (39 percent of PJM capacity) to 50,000 MW (24 percent), a 38 percent reduction in the size of the fleet.

As we have seen in other regions, power grids have not yet mastered the task of managing high levels of wind and solar generation. It is not Kentucky's responsibility to provide reliability and resilience to the rest of PJM, but that will be of little solace if the grid—and thus Kentucky—becomes susceptible to the blackouts that have plagued other regions. Retiring the Mitchell plant early could be an incremental step in that direction.

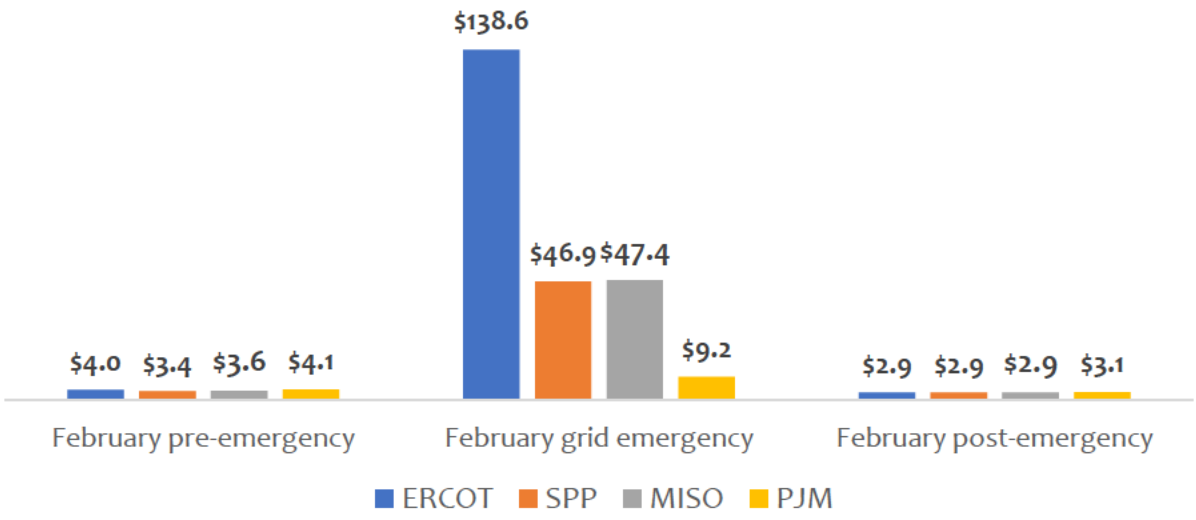
Kentucky benefits from affordable power prices

The cost of electricity to consumers is driven by the cost of generating that electricity, which is in part determined by the cost of the fuels used in generation. In recent years, the prices of both coal and natural gas have been generally low, leading to similarly low power prices. However, this is not the case during periods of extreme demand. Since coal generators maintain on-site fuel that they have procured in advance, coal generation does not cost any more when peak output is required than on a normal day. Because natural gas generators must procure gas in real time, market forces can drive prices to astonishing levels due to competition for limited fuel supplies among power generators (and with industrial and home heating customers who also rely on the fuel). These high natural gas prices translate into equally high power prices. Such volatile prices may last for only a few hours or a few days, but that can be sufficient to cause significant economic harm.

According to NETL, the bomb cyclone winter storm of early 2018 increased demand for natural gas to such an extent that market prices for gas in the PJM region increased by 2,200 percent, with electricity prices increasing by a corresponding 500 percent. During a two-week period that spanned the bomb cyclone, total electricity cost to the eastern US power regions (PJM, MISO, NYISO, and ISO-NE) was $6.78 billion higher than the two weeks before. At the time, NETL estimated that natural gas price excursions during winter storms had cost these regions $25 billion since 2014.[xv] NETL also concluded that these extreme natural gas and power prices were driven in large part by the retirement of coal generators and a resulting increase in reliance on natural gas for power generation.[xvi]

More recent evidence from the period surrounding the ERCOT grid emergency of last February shows the same dynamic. Extreme demand for natural gas, coupled with weather-induced supply reductions, saw natural gas prices increase by a factor of roughly 40 times over what they were at both the beginning and end of the month. Electricity prices—for those who were able to get electricity—often rose by a factor of several hundred and were capped at the ERCOT price ceiling of $9,000 per MWh. In the other regions that suffered February power outages, natural gas prices also spiked to nearly 15 times more than prices before and after the grid emergencies.[xvii] PJM natural gas prices diverged from the rest of the month by a relatively mild factor of 2.5.

Regional natural gas prices before, during, and after Feb. 15-18 grid emergencies ($/MMBtu)

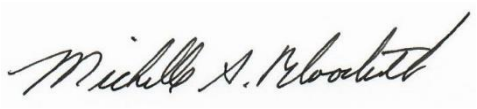


Conclusion

Kentucky derives significant benefits from Kentucky Power's Mitchell plant. These values are outside of and in addition to the value provided by the plant to its owner as part of its generating portfolio. The reliability and resilience provided to the state and region are needed and will be available in increasingly shorter supply if states in PJM embark on a path to decarbonize their power generation, a path that will take longer than proponents may claim. This can be seen in the cautionary tales provided by other power regions that have increased their reliance on wind and solar power only to be faced with grid emergencies and blackouts during periods of extreme power demand. The Mitchell plant, and coal generation in Kentucky and across PJM and the U.S., offer a hedge against extreme natural gas and power prices that are caused by these conditions.

In conclusion, in the best interests of Kentucky electricity consumers and to safeguard the reliability and resilience of the state's electricity grid, America's Power respectfully requests that the Commission reconsider its decision and approve the steps required for Mitchell to comply with both the CCR and ELG rules promulgated by the federal EPA and continue operating to the end of its useful life.

Respectfully submitted,



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[i] EIA, *Electric Power Monthly Update with Data for March 2021*, May 25, 2021.
[ii] Quanta Technology, *Ensuring Reliability and Resilience: A Case Study of the PJM Power Grid*, April 23, 2018.
[iii] NETL, *Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events*, DOE/NETL-2018/1883, March 13, 2018.

[iv] NERC, *Generation Retirement Scenario Special Reliability Assessment*, December 18, 2018, Figure 1.5.
[v] Testimony of PJM President and CEO Manu Asthana, Senate Committee on Energy & Resources Hearing on the Reliability, Resiliency, and Affordability of Electric Service, March 11, 2021.
[vi] Generation data from each RTO's website.
[vii] EIA Form 860, Form 923, and EIA Hourly Electric Grid Monitor. (https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48).
[viii] EIA, "Extreme winter weather is disrupting energy supply and demand, particularly in Texas", February 19, 2021, https://www.eia.gov/todayinenergy/detail.php?id=46836.
[ix] NETL, *Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events*, DOE/NETL-2018/1883, March 13, 2018.
[x] As reported by R. Walton, "NERC identifies 4 regions facing potential summer energy shortages," *Utility Dive*, May 18, 2021, https://www.utilitydive.com/news/nerc-cybersecurity-concerns-summer-energy-shortages-texas-california/600324/.
[xi] Electric Power Research Institute, "Powering Decarbonization Strategies for Net-Zero CO2 Emissions," February 2021.
[xii] http://www.transwestexpress.net/about/timeline.shtml.
[xiii] EIA, *Monthly Generator Inventory*, October 2020.
[xiv] Lazard, *Lazard's Levelized Cost of Storage Analysis Version 6.0,* October 2020.
[xv] NETL, *Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events*, DOE/NETL-2018/1883, March 13, 2018.
[xvi] NETL, *Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume IIa: Case Study: Organized Markets of the Eastern Interconnection*, DOE/NETL-Pub-22481, April 19, 2019.
[xvii] Points of comparison are day-ahead price surveys for natural gas trading days before the grid emergencies (for gas delivery on 2/1 to 2/5 and 2/8 to 2/12), during the emergencies (2/16 to 2/19), and after the emergencies (2/22 to 2/26). Market price indices used are Chicago Citygate (MISO), NGPL TX-OK Border (SPP), Tetco M3 (PJM), and the average of Katy and Waha Hub (ERCOT). Market data is from S&P Global Intelligence.

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