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Public Comments of America's Power
Submitted to The West Virginia Public Service Commission

Case No. 20-1040-E-CN – Appalachian Power Company and Wheeling Power Company
June 1, 2021

America's Power is pleased to provide comments on the Application for Certificate of Public Convenience and Necessity filed with the Public Service Commission of West Virginia ("Commission") on December 23, 2020 by Appalachian Power Company and Wheeling Power Company (the "Application"), both of which are regulated electric utilities and operating subsidiaries of American Electric Power ("AEP"). America's Power is a national trade association representing coal-fueled electric power generation. Our membership includes mining companies, mining equipment and service providers, rail and barge transportation, and owners and operators of power plants. We support an all-of-the-above energy policy that includes coal, natural gas, renewables, nuclear power, and other resources that can provide reliable, resilient, and affordable electricity.

In the Application, AEP presents financial modeling and analysis suggesting the company is indifferent to whether or not the Mitchell power plant is retired early or takes steps to comply with EPA regulations so that it may continue operation to the end of the facility's useful life in 2040. Therefore, AEP has asked the Commission to determine Mitchell's fate.[i]

Although there are valid reasons to question the financial modeling assumptions and methodology that led to AEP's indifference on extending the operating life of the Mitchell plant, it is not the intent of America's Power to do so here. Rather, it is our goal to show that even if AEP has no strong preference for the future of the Mitchell plant, the state of West Virginia should. The power plant is fueled by West Virginia coal, supporting that critical sector of the state's economy. It 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. The Commission should approve the steps required for Mitchell to comply with EPA rules and continue operating to the end of its useful life.

Mitchell is supplied by West Virginia coal

The operation of the Mitchell plant has a significant benefit to the West Virginia economy. In particular, the coal that fuels the facility's electricity production is overwhelmingly sourced from within the state. In the five-year period from 2016 through 2020, almost 94 percent of the coal purchased for consumption at Mitchell was sourced from West Virginia mines. Annually, this averaged 2.6 million tons of West Virginia coal, bringing $124 million in revenue to the state's miners.[ii] This production and its associated mining jobs will likely be permanently lost with the closure of Mitchell.

If Mitchell retires, AEP notes in the Application that it would expect to replace the plant's generating capacity with a combination of new natural gas generation and market power purchases. The ultimate source of the natural gas that would fuel this hypothetical new capacity cannot be known with any certainty, as production from multiple areas are combined in natural gas pipeline systems. West Virginia is a small component of regional gas production, however, producing roughly one-third of what is produced in neighboring Pennsylvania.[iii]

West Virginia 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 West Virginia. Power generation and electricity demand are coordinated across the region, and West Virginia 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,[iv] 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."[v]
- 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."[vi]
- 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.[vii]
- 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."[viii]

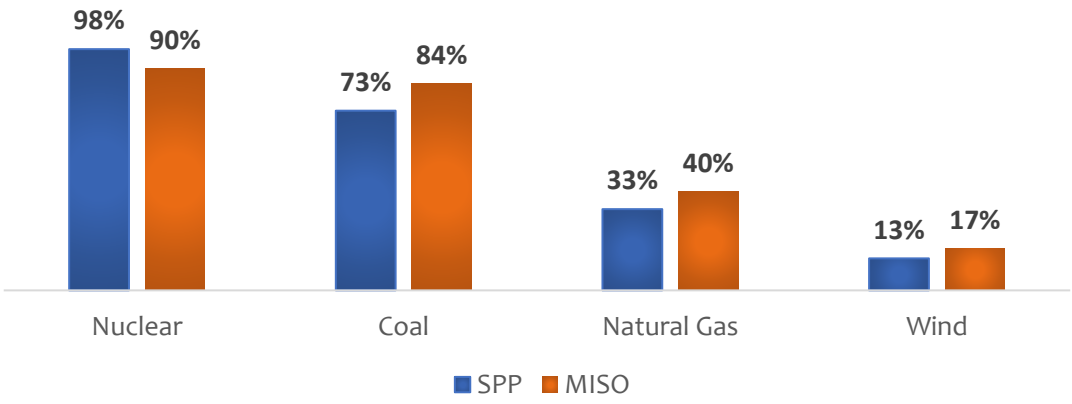
PJM has not experienced any significant reliability-related outages in recent years, something that cannot be said of other electricity regions. As recently as February of this year, severe winter weather saw the ERCOT, SPP, and MISO regions forced to declare emergency conditions and shed load as electricity 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[ix]

	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[x]



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.[xi] 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).[xii] 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."[xiii]

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.[xiv] 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.[xv]

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.[xvi] 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.[xvii]

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 West Virginia's responsibility to export reliability and resilience to the rest of PJM, but that will be of little solace if the grid—and thus West Virginia—becomes susceptible to the blackouts that have plagued other regions. Retiring the Mitchell plant could be an incremental step in that direction.

West Virginia benefits from affordable power prices

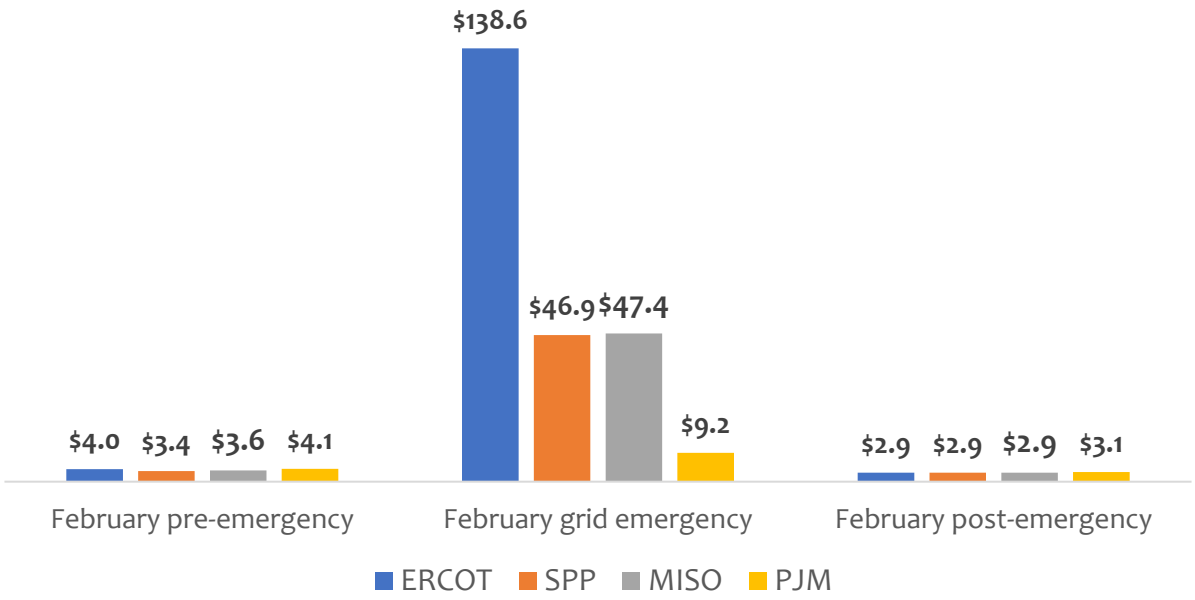
The cost of electricity to consumers is driven by the cost of generating that electricity, which is in part determined by the cost of the fuels used in generation. In recent years, the prices of both coal and natural gas have been generally low, leading to similarly low power prices. However, this is 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. Since 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.[xviii] 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.[xix]

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.[xx] 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

As is the case with other coal-fueled power plants in the state, West Virginia derives significant benefits from AEP's Mitchell plant. These values are outside of and in addition to the value provided by the plant to its owner AEP as part of its generating portfolio. Again, like other coal-fired power plants in the state, fuel consumed by Mitchell is purchased from coal mines within the state, benefitting the local economy. 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 West Virginia and across PJM and the U.S., offer a hedge against extreme natural gas and power prices that are caused by these conditions. All this, coupled with the fact that AEP's own analysis is indifferent to whether Mitchell operates or retires, makes it clear

that the Commission should approve steps needed for Mitchell to comply with both the CCR and ELG rules promulgated by the federal EPA.

Respectfully submitted,

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[i] The Application contemplates the future of three coal-fueled power plants owned by AEP in West Virginia: the Amos, Mountaineer, and Mitchell facilities. Each of these power plants will require investments to comply with rules enacted by the federal Environmental Protection Agency ("EPA"). The coal combustion residuals rule ("CCR" rule) requires these power plants to modify their unlined CCR storage ponds or cease operations, essentially immediately. The effluent limitations guidelines rule ("ELG" rule) requires these facilities to modify their wastewater discharge systems or cease operation by the end of 2028. AEP presents financial modeling and analysis that supports investments at all three facilities to comply with the CCR rule, allowing each plant to continue operations through 2028. AEP also recommends investments at Amos and Mountaineer to comply with the ELG rule, allowing them to continue operating to the end of their useful life in 2040. At the Mitchell facility, AEP's financial analysis found the company to be indifferent regarding whether or not to make the power plant compliant with the ELG rule, essentially a coin flip decision that AEP has asked the Commission to make.

[ii] EIA Form 923 filings.

[iii] EIA, *Natural Gas Monthly*, May 2021. In 2020, West Virginia natural gas production was 2.594 billion cubic feet, which is 35.6 percent of Pennsylvania's 7.29 billion cubic feet of natural gas produced.

[iv] EIA, *Electric Power Monthly Update With Data for March 2021*, May 25, 2021.

[v] Quanta Technology, *Ensuring Reliability and Resilience: A Case Study of the PJM Power Grid*, April 23, 2018.

[vi] 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.

[vii] NERC, *Generation Retirement Scenario Special Reliability Assessment*, December 18, 2018, Figure 1.5.

[viii] 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.

[ix] Generation data from each RTO's website.

[x] EIA Form 860, Form 923, and EIA Hourly Electric Grid Monitor. (https://www.eia.gov/electricity/gridmonitor/dashboard/electric_overview/US48/US48).

[xi] 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.

[xii] 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.

[xiii] 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/.
[xiv] Electric Power Research Institute, "Powering Decarbonization Strategies for Net-Zero CO2 Emissions," February 2021.
[xv] http://www.transwestexpress.net/about/timeline.shtml.
[xvi] EIA, *Monthly Generator Inventory*, October 2020.
[xvii] Lazard, *Lazard's Levelized Cost of Storage Analysis Version 6.0,* October 2020.
[xviii] 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.
[xix] 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.
[xx] 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.