



May 7, 2018

Federal Energy Regulatory Commission
Secretary of the Commission
888 First Street, NE
Washington, DC 20426

Attn: Docket ID No. AD18-7-000

Re: Grid Resilience in Regional Transmission Organizations and Independent System Operators

Comments submitted electronically at <http://www.ferc.gov>

The American Coal Council (ACC) appreciates the opportunity to submit these comments in reply to responses of Regional Transmission Operators (RTO) and Independent System Operators (ISO) to the Federal Energy Regulatory Commission (FERC) in its Order Terminating Rulemaking Proceeding, Initiating New Proceeding, and Establishing Additional Procedures issued on January 8, 2018. The ACC has been in existence for 36 years and represents the collective business interests of the American coal industry. Our members include mining companies and suppliers, transportation companies and terminals, electric utilities and independent power producers, industrial coal consumers, and many industry support services providers. Since our member companies touch every aspect of turning one of America's most abundant resources into reliable and affordable electricity for the United States economy, our Association has first-hand knowledge of the direct and indirect impacts of new coal-related regulations and a unique, "boots on the ground" perspective. Our diverse membership base encompasses the entire coal supply chain, and it is from this broad perspective that we assess the impacts of new policies and regulations impacting coal supply and use. While ACC provides these comments from that broad perspective, individual member companies of ACC may submit separate comments on their own behalf that offer additional or other views.

ACC submitted prior comments to FERC in October 2017 in response to the proposal by Secretary of Energy Rick Perry to FERC for incorporating the value of grid resilience into electricity markets pricing. FERC did not adopt Secretary Perry's proposed rule and

subsequently initiated this proceeding. In our prior comments, ACC addressed the negative implications of a generation mix characterized by greater amounts of less efficient, intermittent sources and the rising cost of electricity in places that have moved away from economical, stably-priced coal. We urged corrective actions be taken by FERC to mitigate future risks associated with decreasing resource diversity, on-demand fuel availability issues, and fuel supply risk.

In ACC's prior comments, we emphasized the need for prompt action by FERC to address the imperative of under-recognized attributes and contributions from baseload power plants and the importance of maintaining a diverse generation portfolio. We provided examples then of newly-announced plans to close about 4,000 megawatts of coal generation in Texas and recent California ISO electricity supply and reliability concerns that reinforced – in essentially “real-time” fashion – the urgency of FERC's need to act without delay. The shutdowns of those plants in Texas proceeded as planned early this year. Other coal plant retirements continue to be announced.

With ACC's comments submitted to FERC today, there is a new “real-time” example further highlighting the urgent need for action by FERC on market reforms to support grid resilience. Severe weather during a sustained period from late December through early January this winter was an operational test for the bulk power system's resilience. Now known as the “Bomb Cyclone”, much of the nation was affected by this severe weather event but particularly the east coast, New England, and New York. During this period of greatly increased electricity demand, the system responded adequately but there was significant stress especially to regions with less fuel diversity and fewer baseload generation resources such as coal.

Following the Bomb Cyclone, a congressional hearing was held by the Senate Committee on Energy and Natural Resources (Senate ENR Committee) to examine the performance of the bulk power system during the event. Testimony was presented including by FERC, the North American Electric Reliability Corporation (NERC), regional transmission operators PJM Interconnection (PJM) and ISO New England (ISO-NE), and the Department of Energy (DOE).

North American Electric Reliability Corporation – Senate Testimony

The prepared remarks to the Senate ENR Committee of Charles A. Berardesco, Interim President and Chief Executive Officer of NERC, indicated the New England region incurred the greatest stress to the system.¹ This was due to high natural gas prices and record-setting gas consumption for heating and non-power generation uses that resulted in higher

¹ Testimony of Charles A. Berardesco, Interim President and Chief Executive Officer, North American Electric Reliability Corporation, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 4, available at https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=D982B4F9-ECAF-403B-88BA-C82D2634E2DA

fuel oil consumption and a depletion of oil inventories for which replenishment was delayed because of the storm. Additionally, a nuclear power station was forced offline in Massachusetts for several days due to a transmission system outage.² Natural gas generating resources in the Northeast were compromised by inability to access natural gas due to the interruptible nature of pipeline transportation agreements and limited pipeline capacity.³ Additionally, high natural gas prices caused a shift from gas to fuel oil.⁴

Mr. Berardesco also pointed out that NERC's reliability assessments continue to make recommendations regarding reliable fuel supply and the importance of fuel diversity.⁵ The assessments warn about the increasing dependence on natural gas, as four of NERC's assessment areas are now meeting more than 50% of their peak electric demand needs by relying on natural gas fired generation.⁶

NERC's 2017/2018 Winter Reliability Assessment notes an increasing trend since 2012 of natural gas generation outages in the winter, and Mr. Berardesco's testimony states "These historical outages that resulted from fuel unavailability during the winter months underscore the need for fuel assurance and operational readiness during periods when reliance on natural gas can be critical."⁷

ISO New England – Senate Testimony and Comments to FERC

The prepared remarks of Gordon van Welie, President and Chief Executive Officer of ISO New England, at the Senate ENR Committee hearing noted ongoing concerns since 2013 about the increasing reliance on natural gas generation in that region.⁸ Furthermore, Mr. van Welie pointed to the recent "Operational Fuel Security Analysis" (OFSA) by ISO-NE analyzing various future winter operational cases in New England with the finding that fuel security risk is the "foremost challenge to a reliable power grid in New England" and ".....the headline is that New England's limited fuel infrastructure will eventually cause severe reliability issues if fuel security is not addressed."⁹

² Testimony of Charles A. Berardesco, Interim President and Chief Executive Officer, North American Electric Reliability Corporation, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 4, available at https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=D982B4F9-ECAF-403B-88BA-C82D2634E2DA.

³ *Id* at p. 7.

⁴ *Ibid.*

⁵ *Ibid.*

⁶ Testimony of Charles A. Berardesco, Interim President and Chief Executive Officer, North American Electric Reliability Corporation, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 6, available at https://www.energy.senate.gov/public/index.cfm/files/serve?File_id=D982B4F9-ECAF-403B-88BA-C82D2634E2DA

⁷ *Ibid.*

⁸ Testimony of Gordon van Welie, President and Chief Executive Officer, ISO New England, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 1, available at https://www.iso-ne.com/static-assets/documents/2018/01/testimony_gordonvanwelie_january232018.pdf

⁹ *Ibid.*

Mr. van Welie's testimony went on to describe the OFSA study results which showed that energy shortfalls due to inadequate fuel would occur in 19 of the 23 scenarios analyzed, and because of this frequent emergency actions would be needed to protect reliability, including requests for voluntary conservation by customers and involuntary rolling blackouts.¹⁰ Furthermore, he advised it will be costly to alleviate the fuel security problems regardless of whether through additional renewable energy and related transmission, long term contracts for fuel infrastructure, or other measures to reduce demand for wholesale electricity and natural gas.¹¹

This paints a dismal or perhaps even dire picture for the future of electricity price and availability in New England, where consumers in addition to those in California already pay the highest rates in the country. This picture must not become the future elsewhere.

ISO-NE's comments to FERC in this docket reinforce the comments made in Mr. van Welie's testimony to the Senate ENR Committee. Summarizing New England's fuel security challenges, ISO-NE's FERC comments state:

"In summary, while New England is meeting its resource adequacy requirements for *capacity* – which are based on expected summer peak demands – with the market mechanisms that are in place today, from an *energy* availability standpoint, the shift from generators with on-site fuel to generators relying on "just in time" fuel delivery is challenging the system's adequacy and, therefore, its resilience, particularly during winter peak demands. More specifically, the constrained gas-fuel infrastructure is unable to supply all of the region's increasing numbers of natural gas-fired generators. This fuel security risk is exacerbated by the difficulty in permitting dual-fired generating capability, emissions restrictions limiting generators' ability to operate on the alternate fuel, and the reality that aging oil, coal, and nuclear generators with fuel on-site are becoming less economically competitive and may seek to retire before the region has addressed the fuel-delivery constraints or added sufficient alternative resources to replace the retiring resources."¹²

ISO-NE's comments to FERC affirm that there is currently no defined long-term solution to ISO-NE's fuel security resilience problem.¹³ This is another reason for FERC to address grid resiliency and support retention of existing coal and other baseload resources now.

¹⁰ Testimony of Gordon van Welie, President and Chief Executive Officer, ISO New England, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 5, available at https://www.iso-ne.com/static-assets/documents/2018/01/testimony_gordonvanwelie_january232018.pdf

¹¹ *Id* at p. 6.

¹² Response of ISO New England Inc. to the Federal Energy Regulatory Commission, Docket No. AD18-7-000, March 9, 2018, p. 8

¹³ *Id* at p. 4.

While other regions may not face exactly the same set of constraints and risks that ISO-NE is challenged by, there are common elements that reinforce the need for FERC action.

PJM Interconnection – Senate Testimony and Comments to FERC

The prepared Senate ENR Committee testimony of Andrew L. Ott, President and CEO of PJM Interconnection, addressed the physical infrastructure needs of the system in terms of enhancing gas-electric coordination and protecting critical infrastructure. However, Mr. Ott observed that without a compensation system that appropriately values the attributes any resource bring to the grid, it will be difficult to attract capital investment for these physical infrastructure needs, especially those needed to ensure resilience in the generation fleet.¹⁴

Mr. Ott indicated in his prepared Senate testimony that PJM has proposed key compensation reforms, stating: “Today, we operate under a set of rules written in a vastly different time that limit the ability of certain generating units to set prices in a given hour. These units are still compensated for their costs to operate, but because they are not able to set clearing prices, those clearing prices are artificially lower than they should be in those hours. This has a price-suppressive effect on all generating units, including nuclear and coal generation, as well as natural gas and renewable generation. Price formation reforms in this area were specifically recommended by the DOE in its comprehensive August 2017 analysis. This type of reform, along with reforms to pricing during certain times when we are approaching temporary shortage conditions, would, in our view, go a long way toward properly compensating *all* generation needed to serve demand.”¹⁵

Further, “We understand that we carry the burden to justify these pricing changes to FERC, our regulator. We have begun a stakeholder process on this issue. But to avoid the potential for delay, we feel it would be helpful for the Commission to impose some process timelines around this debate, at least at the stakeholder level, so these issues can get to the regulator and not languish.”¹⁶

And, “The recent cold snap has demonstrated this need very clearly. We pay what we call “out-of-market payments” to generators for their costs to run when we call on them for reliability purposes. These costs are not currently reflected in PJM’s energy pricing. While out-of-market payments have improved since the Polar Vortex (approximately \$16 million per day) we still saw significant payments during the recent event (approximately \$4 million per day). By contrast, on a typical day, out-of-market payments may be approximately

¹⁴ Testimony of Andrew L. Ott, President and CEO, PJM Interconnection, L.L.C., before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 7, available at <http://www.pjm.com/-/media/library/reports-notice/special-reports/2018/20180123-testimony-andrew-ott-to-us-senate.ashx?la=en>

¹⁵ *Ibid.*

¹⁶ Testimony of Andrew L. Ott, President and CEO, PJM Interconnection, L.L.C., before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 8, available at <http://www.pjm.com/-/media/library/reports-notice/special-reports/2018/20180123-testimony-andrew-ott-to-us-senate.ashx?la=en>

\$400,000 to \$500,000. This further demonstrates the need to improve pricing for those generators that we must run for reliability but also need to be paid out-of-market payments.”¹⁷

In response to questions from the Senate ENR Committee, Mr. Ott also referenced the important role coal played in providing electricity during the Bomb Cyclone to the 65 million people living in the PJM region. “For this past event, 45,000 megawatts of the electricity that we delivered, which is 40 percent or more, was coal-fired. We could not have served customers without the coal-fired resources. That’s the reality. The point is – are the prices reflecting the fact that those resources are running? My answer is no it’s not – we need to fix that.”¹⁸

PJM’s comments to FERC in this resilience docket expand on the need for power pricing reform expressed by Mr. Ott to the Senate ENR Committee. Broadly with respect to resilience considerations, PJM suggests not limiting them to high-impact, low frequency events and to include vulnerabilities that evolved over time and that threaten bulk power system reliability but are not yet adequately addressed by existing RTO planning processes or market design.¹⁹ Per PJM, power pricing reforms should address PJM’s reserve markets, shortage pricing market rules, and price formation. Further, PJM recommends that FERC request RTOs and jurisdictional transmission providers propose market reforms and related compensation mechanisms to address resilience concerns within nine to twelve months following a Final Order being issued by FERC in the current docket.²⁰

PJM’s recommendation of a specific timeframe reinforces Mr. Ott’s Senate ENR Committee testimony cautioning FERC to “avoid the potential for delay” and not let these power market reform issues “languish”.

Department of Energy – Senate Testimony

The prepared testimony for the Senate ENR Committee hearing also supports moving forward promptly to address resilience issues, especially in the wake of the Bomb Cyclone:

“What was apparent during this weather event was the continued reliance on baseload generation and a diverse energy portfolio. Without action that recognizes the essential reliability services provided by a strategically diversified generation

¹⁷ Testimony of Andrew L. Ott, President and CEO, PJM Interconnection, L.L.C., before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 8, available at <http://www.pjm.com/-/media/library/reports-notice/special-reports/2018/20180123-testimony-andrew-ott-to-us-senate.ashx?la=en>

¹⁸ Paul Ciampoli, American Public Power Association, “Polar Vortex Lessons Seen as Helping in Bomb Cyclone Response”, January 25, 2018, available at <https://www.publicpower.org/periodical/article/polar-vortex-lessons-seen-helping-bomb-cyclone-response>

¹⁹ Comments and Responses of PJM Interconnection, L.L.C. to the Federal Energy Regulatory Commission, Docket No. AD18-7-000, March 9, 2018, p. 4

²⁰ *Id* at p. 6.

portfolio, we cannot guarantee the resilience of the electric grid. The grid's integrity is maintained by an abundant and diverse supply of fuel sources today, especially with onsite fuel capability. However, the real question is whether or not this diversity will be here tomorrow.”²¹

Mr. Walker proposed that DOE build an integrated resilience model for the purposes of analysis of ongoing resilience planning efforts at the local, state, and regional levels and including interconnections to Canada and Mexico and to fill in any gaps and inconsistencies in those efforts.²²

DOE National Energy Technology Laboratory Bomb Cyclone Analysis

DOE’s National Energy Technology Laboratory (NETL) released a post-Bomb Cyclone analysis on March 27, 2018 titled “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units, Volume I: The Critical Role of Thermal Units During Extreme Weather Events”. This analysis focused on five areas of organized markets administered by ISOs: ISO New England, New York ISO (NYISO), PJM Interconnection, Midcontinent ISO (MISO), and the Southwest Power Pool (SPP). The analysis was subsequently expanded to include the Electric Reliability Council of Texas.

DOE NETL’s announcement about the analysis quoted Peter Balash of NETL’s Energy Systems Analysis team, who said the new study showed that “coal was the most resilient form of power generation during the event and that removing coal from the energy mix would worsen threats to the electrical grid’s dependability during future severe weather events.”²³

The DOE NETL report stated “During the worst of the storm from January 5-6, 2018, actual U.S. electricity market experience demonstrated that without the resilience of coal- and fuel oil/dual-firing plants—its ability to add 24-hour baseload capacity—the eastern United States would have suffered severe electricity shortages, likely leading to widespread blackouts.”²⁴

²¹ Testimony of Bruce A. Walker, U.S. Department of Energy Office of Electricity Delivery and Energy Reliability, before the Senate Energy and Natural Resources Committee, January 23, 2018, p. 1, available at <https://www.energy.gov/sites/prod/files/2018/03/f49/03-01-18%20SENR%20Testimony%20of%20Assistant%20Secretary%20Bruce%20J.%20Walker.pdf>

²² *Id* at p. 2.

²³ U.S. Department of Energy, Office of Fossil Energy, “NETL Study Highlights the Importance of Coal for Power Generation During “Bomb Cyclone” Power Demands”, March 27, 2018, available at <https://www.energy.gov/fe/articles/netl-study-highlights-importance-coal-power-generation-during-bomb-cyclone-power-demands>

²⁴ U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 3, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

Below are the “Key Takeaways”²⁵ of the DOE NETL report:

- “Across the six ISOs, coal provided 55% of the incremental daily generation needed, or 764,000 out of 1,213,000 gigawatt-hours per day (GWh/d)
- Combined, fossil and nuclear energy plants provided 89% of electricity during peak demand across all the ISOs, with 69% coming from fossil energy plants (nearly all from traditional baseload sources)
- Due to natural gas pipeline and delivery constraints, fuel oil provided almost all the surge capacity in the Northeast, barely enabling ISO-NE, in particular, to meet demand, as it experienced rapid depletion of its fuel oil storage reserves
- In PJM, the largest of the ISOs, coal provided the most resilient form of generation, due to available reserve capacity and on-site fuel availability, far exceeding all other sources (providing three times the incremental generation from natural gas and twelve times that from nuclear units); without available capacity from partially utilized coal units, PJM would have experienced shortfalls leading to interconnect-wide blackouts
- In PJM, the value of fuel-based power generation resilience during this event was estimated at \$3.5 billion
- Lack of sufficient natural gas pipeline infrastructure and the surge in natural gas demand for heating led to sharp increases in natural gas spot prices exceeding 300% across the Northeast and Mid-Atlantic. The spike was particularly acute in New York with Transco Zone 6 NY spot prices rising nearly 700% from December 28 (\$17.65/MMBtu) to January 5 (\$140.25/MMBtu).
- Natural gas prices and availability for power resulted in units with dual-fuel capability (the ability to use different fuels) playing an important role. Fuel switching enabled units, which would have otherwise been uneconomic or taken offline due to natural gas prices, to provide resilient capacity by firing fuel oil, particularly in ISO-NE where in excess of 2 million barrels of oil were burned over the 12-day period (representing more than 50% of the capacity available under the ISO’s Winter Reliability Program). An estimated 60% of fuel oil in the Petroleum Administration for Defense District (PADD) I is directly imported or derived from imported crude oil
- Nuclear energy, while vital to a stable grid, generally ran at maximum output, with negligible additional capacity to bring online during this event
- Available wind energy was 12% lower during the Bomb Cyclone than for a typical winter day resulting in a need for dispatchable fossil generation to make up this

²⁵ U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 1-2, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

generation in addition to its resiliency role in meeting the greater demand during the event

- Retirement of aging coal and nuclear generation infrastructure may be underestimated which could give rise to reliability concerns and an inability to meet projected electricity demand; however, more study is required to evaluate the impact”

For additional context related to coal versus other generation resources in the DOE NETL Bomb Cyclone analysis, following are important DOE NETL observations:

ISO-NE

- ISO-NE is served by a single 50,000 barrel per day oil pipeline which only two of the region’s 83 dual-fuel units are connected to and this pipeline also services home heating oil and other petroleum needs in the region, so fuel for power plants must primarily be delivered by truck or rail²⁶ which could also be impacted by severe weather events.
- Though natural gas supply was available nearby in Pennsylvania it could not be obtained due to pipeline limitations. Gas substituting for oil in this region would have required 5 bcf or pipeline throughput of 175 MMcf/day.²⁷

PJM

- According to EIA, peak coal generation in PJM of 1,200 GWh on January 5, 2018 exceeded the combined total output of NYISO (500 GWh) and ISO-NE (370 GWh) and the increase in PJM coal generation of 367 GWh is equivalent to the output of ISO-NE at 370 GWh.²⁸
- Resource besides coal and oil provided little to no surge capacity. For natural gas, this was primarily due to economics. For nuclear, it was due to plants already running at maximum capacity. For wind, it was due to highly variable output, and the average output declined.²⁹
- The natural gas total daily GWh production in PJM decreased by 21% during the period January 2-8, 2018; it was coal and secondarily oil used mainly in dual-fuel natural gas units that supplied the electricity critical to keeping natural gas fired

²⁶ U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 11, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

²⁷ *Ibid.*

²⁸ U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 12, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

²⁹ *Ibid.*

- residential furnace fans operating in the extreme cold.³⁰
- NETL’s analysis of a hypothetical scenario of the PJM region without coal during the Bomb Cyclone showed a 9-18 GW capacity shortfall that would have led to system collapse.³¹
 - The ramp up of coal generation to meet the surge in PJM electricity demand during the Bomb Cyclone included generating units that are most likely to retire due to “insufficient market support”; these units were not running at baseload levels before the event.³²

The DOE NETL report cautions smaller ISO regions with less direct reliance on coal against assuming they will not be impacted during future extreme weather events, as situations could develop whereby they need electricity to be transferred from larger ISOs including those with significant coal generating capacity.

The DOE NETL report assesses the impact of an aging coal fleet and oncoming retirements. NETL reports the announced U.S. coal retirements at 31 GW through 2025 and EIA-projected retirements at 41 GW by 2025.³³ However, NETL suggests EIA’s assumed coal capacity factor at 72 percent is unrealistically high due to the age of the fleet, detrimental impacts of running plants more in cycling mode, and New Source Review barriers to investments in the fleet. As NETL considered the generation and capacity impact, it calculated 24 GW of new generation at an 80 percent capacity factor or 29 GW at a 65 percent capacity factor would be needed.³⁴ NETL states that would also equate to 35 GW of retirements of existing units.³⁵ This means additional coal retirements could be as much as 76 GW by 2025.

Another concern ACC has is that more recently larger, newer coal units with ages less than the fleet average are being retired. Some of this is due to the inability to “compete” with intermittent resources which force power onto the grid at negative prices to ensure they can collect payments of federal tax credits and power purchase agreements.

The actual contributions of intermittent resources are limited, especially at critical times including the heat of the summer and cold of the winter. The DOE NETL report indicates at least three times as much wind is needed to replace a coal plant during the cold winter

³⁰ U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 15, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

³¹ *Id* at p. 17-18.

³² U.S. Department of Energy, National Energy Technology Laboratory, “Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events”, March 13, 2018, p. 18, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

³³ *Id* at p. 25.

³⁴ *Id* at p. 29.

³⁵ *Ibid*.

months.³⁶ Since wind plants are not dispatchable, they cannot be ramped up to meet demand increases.

NETL cautions about assuming that natural gas plants and firm pipeline capacity and infrastructure could or would be permitted, developed, and constructed in time to replace the loss of reliable, resilient coal and nuclear plants.³⁷ Further, if additional intermittent renewable capacity is built, back-up gas generation and firm pipeline capacity or energy storage would be needed.

Conclusions

As ACC indicated in its prior grid resiliency comments last fall, without action by FERC, the U.S. will continue to default to the current scheme of electricity markets pricing. The absence of action will promote the path of reduced fleet and fuel diversity and is likely to expose consumers to higher electricity prices and diminished reliability and resilience. The Bomb Cyclone is a case study in fuel security and resilience issues. It underscores the critical role of the U.S. coal fleet and demonstrates why power market reforms are needed to properly value and compensate for resiliency attributes.

PJM has suggested certain pricing-related reforms and a timeline, but reforms are needed throughout the organized power markets. FERC must take the lead on this without delay, expediting efforts of states, RTOs/ISOs, and other stakeholders. Failure to do so will make it all but impossible to protect the future reliability and resilience of our nation's bulk power system.

Respectfully submitted,

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³⁶ U.S. Department of Energy, National Energy Technology Laboratory, "Reliability, Resilience and the Oncoming Wave of Retiring Baseload Units Volume I: The Critical Role of Thermal Units During Extreme Weather Events", March 13, 2018, p. 32, available at https://www.netl.doe.gov/energy-analyses/temp/ReliabilityandtheOncomingWaveofRetiringBaseloadUnitsVolumeITheCriticalRoleofThermalUnits_031318.pdf

³⁷ *Id* at p. 31.