UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

Grid Reliability and Resiliency Pricing	)	**Docket No. RM18-1-000**

COMMENTS OF ADVANCED ENERGY BUYERS GROUP

October 23, 2017

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I. INTRODUCTION

Pursuant to the Federal Energy Regulatory Commission's ("Commission" or "FERC") October 2, 2017, Notice Inviting Comments,[1] the Advanced Energy Buyers Group ("AE Buyers Group") on behalf of large energy users[2] urges the Federal Energy Regulatory Commission ("FERC" or "Commission") to decline to finalize the Grid Resiliency Pricing Rule proposed by the Department of Energy ("DOE") in a Notice of Proposed Rulemaking ("NOPR") in Docket No. RM18-1-000. Members of the AE Buyers Group totaled over $1 trillion in revenue last year, and consume well over 16 TWh of electricity annually. As companies dependent upon the availability of electricity on a 24-hour basis, we support efforts to ensure access to reliable, resilient, and affordable electricity. However, we are extremely concerned that DOE's NOPR is an unnecessary intrusion into wholesale markets that would impose burdensome costs on consumers, including members of the AE Buyers Group, with initial estimates of up to $4 billion annually, while failing to deliver material improvements to the reliability and resilience of the electricity system. Further, we note that the proposed justification for the NOPR—namely that a reliability or resilience "emergency" must be addressed immediately—is at odds with factual analysis and evidence of the reliability and resilience of the current U.S. electric grid.

We also note that there is a growing suite of solutions available to improve the reliability and resilience of the U.S. electricity system, including many technologies that we make use of directly, both onsite and offsite. We strongly urge a technology-neutral, market-based,

[1] Federal Energy Regulatory Commission, *Grid Reliability and Resilience Pricing*, Notice Inviting Comments (Oct. 4, 2017).

[2] These comments represent the consensus view of the Advanced Energy Buyers Group (information and membership available at https://info.aee.net/ae-buyers-group). However, this document does not necessarily the reflect the position of any specific member of the AE Buyers Group, and these comments should not be attributed to any individual company or companies participating in the AE Buyers Group.

innovation-focused approach to address any deficiencies in reliability and resilience that the Commission deems in need of attention. We respectfully request that the Commission pursue a deliberative process that gives consumers such as our companies sufficient time to carefully analyze the potential impacts of any changes to electricity markets, which will inform our constructive input.

As explained in more detail below, **first,** the AE Buyers Group is concerned that a final rule adopted in response to the NOPR will cause a significant increase in the operating costs of its members, without providing any demonstrated benefits. **Second,** we argue that the out-of-market solution proposed by DOE will significantly disrupt electricity markets, which is not an optimal approach to improve reliability and resilience even in the case of an emergency. **Third,** as sophisticated customers that are highly dependent on 24/7 electricity that is both reliable and resilient, we have seen no evidence that would cause us to question the capability of the electricity system to efficiently meet consumer needs now and in the future, without the need for a costly federal intervention. **Fourth,** we note that there are many technology and operational solutions available to improve reliability and resilience, and fuel availability is only a small part of the equation.

II. ABOUT THE ADVANCED ENERGY BUYERS GROUP

The Advanced Energy Buyers Group ("AE Buyers Group") is a business-led coalition of large energy users engaging on policies to expand opportunities to procure energy that is secure, clean, and affordable.[3] Members of the AE Buyers Group are leading companies and

[3] See https://info.aee.net/ae-buyers-group for a list of AE Buyers Group members. The AE Buyers Group is convened by Advanced Energy Economy (AEE), a national business association of leading advanced energy companies. Membership in the AE Buyers Group is open only to end users of energy, and AEE's general membership does not have any input in the positions taken by the AE Buyers Group.

organizations spanning a range of market sectors. We share a common interest in expanding our use of advanced energy, such as renewable energy like wind, solar, geothermal, and hydropower; demand-side resources like energy efficiency, demand response, and energy storage; and onsite generation from solar photovoltaics, advanced natural gas turbines, and fuel cells. Our analyses and internal business planning has shown that expanding the use of such technologies will make us more competitive, resilient, and sustainable enterprises far into the future.

III. COMMENTS

The AE Buyers Group agrees that "[e]nsuring that American families and business have access to reliable, resilient and affordable electricity is vital to the economy, national security, and quality of life."[4] As major consumers of electricity and as businesses that depend on a 24/7 supply of electricity, we also agree that "electricity is a key driver of America's economic prosperity" and that electricity is key to job creation as well as technology and innovation.[5] However, we have seen no reason to share DOE's concern that our electricity system is in grave danger and in need of an immediate and unprecedented solution to address threats to reliability and resilience. In fact, the NOPR would disrupt the core functionality of wholesale energy markets by imposing cost-of-service regulation at the expense of market competition. This would lead to unnecessary increases in our operating costs and direct harm to our businesses. We urge FERC to reject the NOPR, as proposed, and pursue an approach that first assesses potential threats to grid reliability and resilience, and then addresses any identified threats through market mechanisms designed to improve reliability and resilience without unduly increasing the cost of electricity.

[4] DOE, Grid Resiliency Pricing Rule, Notice of Proposed Rulemaking, Docket No. RM17-3-000 (hereafter "NOPR"), at 3.

[5] *Id*. at 3.

A. The AE Buyers Group is concerned that the NOPR will significantly increase our operating costs without providing material benefit to the reliability and resilience of the energy system.

Across the country, commercial and industrial consumers account for approximately 62 percent of U.S. electricity consumption, equivalent to over $200 billion in 2016, well over half of which is produced and consumed within FERC-jurisdictional organized wholesale markets.[6] DOE's proposal to provide out-of-market regulatory support to aging and uneconomic plants will inevitably disrupt efficient market functions and increase the cost of electricity in these markets.

While the precise impacts of the proposal are not yet known, it is clear that adopting the broad cost-based compensation contemplated in the NOPR would result in massive cost increases. An initial assessment of DOE's proposal by ICF estimates cost increases of as much as $3.8 billion annually, or $53 billion between now and 2030. This estimate assumes no new capital expenditures at existing plants, and only accounts for plants that are at risk of retirement. The actual cost impacts could be much greater, depending on how the rule is implemented, how many plant operators opt for cost-of-service regulation over competition in the wholesale energy and capacity markets, and how the markets themselves react to a significant amount of capacity being suddenly guaranteed cost recovery.[7] Indeed, another assessment of the NOPR estimates the cost at up to $14 billion annually.[8] Regardless of how markets react and how costs are

[6] Commercial customers accounted for 1,359,617 million kWh and industrial customers accounted for 936,269 million kWh in 2016, out of 3,710,779 kWh total retail sales of electricity. Cost estimate is based on average retail rate for commercial customers (10.37 cents per kWh) and industrial customers (6.75 cents per kWh) in 2016. See U.S. Energy Information Administration (EIA), *Electricity Data Browser,* https://www.eia.gov/electricity/data/browser/.

[7] ICF analysis, as reported in RTO Insider, *ICF Analysis: DOE NOPR Cost Could near $4B/Year* (October 4, 2017), https://www.rtoinsider.com/icf-doe-nopr-76642/.

[8] Sierra Club, *New Analysis Finds Dramatic Costs of Perry's Directive to FERC,* (Oct. 16, 2017) available at http://www.sierraclub.org/press-releases/2017/10/new-analysis-finds-dramatic-costs-perrys-directive-ferc.

distributed, it is clear that costs will increase and that these costs will ultimately be passed on to the businesses and households that consume energy.

Members of the AE Buyers Group collectively consume well over 16 TWh of electricity annually, meaning that even a small increase in the cost of electricity translates to a significant increase in our cost of doing business. While we agree with the statement in DOE's NOPR that electricity is key to "powering machines and technologies that create jobs," we also note that successful businesses must make tradeoffs when investing their resources.[9] Money that goes toward electricity could instead go to new employees, or more research and development. Collectively, the companies active in the AE Buyers Group invest billions of dollars each year in new facilities, employees, services, and products. Increased operating costs from higher electricity prices directly impacts our businesses' ability to grow and innovate.

In addition to increasing operating costs for businesses, the NOPR would result in higher costs for American consumers. Such increases could have collateral impacts across consumer markets—for example, an increase in household energy costs may reduce consumption and slow the growth of our businesses and the economy at large.

Any regulatory intervention resulting in an increase in electricity prices must be carefully evaluated to ensure that the benefits of action and risk of inaction justify the cost. As we explain in more detail below (see III.C.), DOE has failed to demonstrate that the benefits of the NOPR would outweigh the costs.

B. Out-of-market solutions that impose cost-of-service-based regulation in competitive wholesale markets will dramatically undermine the competitive market environment, resulting in inefficient market outcomes and directly harming our businesses.

[9] NOPR at 3.

As proposed, the NOPR would disrupt the core function of competitive wholesale markets and undermine competition by limiting the ability of these markets to send accurate price signals and drive optimal, cost-effective market outcomes. This approach is inconsistent with the Commission's long-standing efforts to maintain and improve the competitive wholesale markets, and would result in direct harm to our companies along with many other customers.[10]

Specifically, we strongly disagree with the proposal to protect a subset of resources from market competition through a guarantee of full cost-of-service compensation. Wholesale markets have been very successful at accurately discovering the value of electricity production and sending efficient price signals to generators and consumers to deliver the most cost-efficient market supply outcomes. The cost-saving benefits of competitive wholesale markets have been confirmed by independent analysis, and by regional transmission organizations ("RTOs") and independent system operators ("ISOs"), including PJM Interconnection, L.L.C. ("PJM") and the Midcontinent Independent System Operator ("MISO").[11] Clear and accurate prices in a stable policy environment are critical to enabling the development and deployment of new energy technologies that help advance economic growth while still meeting customer needs for electricity that is both reliable and resilient.

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[10] Our opposition to the out-of-market approach taken in the NOPR stands separate from our view that the U.S. electricity system does not currently face a reliability or resilience crisis in need of emergency action, an issue we will take up in the next section (III.C.).

[11] *See* Steve Cicala, *Imperfect Markets versus Imperfect Regulation in U.S. Electricity Generation* , University of Chicago (Jan. 2017), available at http://home.uchicago.edu/~scicala/papers/elec_gov_v_mkt_draft_2.pdf, concluding, "markets reduce production costs by $3B per year by reallocating output among existing power plants," with some of these savings coming from a 20% reduction in the cost of operating uneconomic plants due to a 10% reduction in utilization; PJM Interconnection, *PJM Value Proposition*, http://www.pjm.com/about-pjm/value-proposition.aspx, estimating a $2.8 to $3.1 billion net annual benefit to customers from PJM"s operation of the competitive regional wholesale market, including $600 million in annual savings due to enabling "less efficient generation resources to retire and to be replaced with more efficient, less costly, plants"; and, MISO, *Value Proposition*, https://www.misoenergy.org/WhatWeDo/ValueProposition/Pages/ValueProposition.aspx, finding that in 2016 MISO, "provided between $2.6 billion and $3.3 billion in regional benefits, driven by enhanced reliability, more efficient use of the region's existing transmission and generation assets, and a reduced need for new assets."

Injecting new cost-of-service-based regulation and rates into this market system would, in contrast, undermine the accuracy of these price signals and result in inefficient market outcomes. Initial assessments of the NOPR agree that it would have an extremely disruptive impact on wholesale markets. J.P. Morgan Securities analysts concluded, "effectively re-regulating a major portion of the currently de-regulated organized markets via a cost-of-service system would presumably render any existing discernable market pricing mechanisms irrelevant."[12] Morgan Stanley analysts have similarly warned that the NOPR "would bring an end to competitive power markets."[13] A group of former FERC Chairmen and Commissioners filed comments in this docket stating, "Investor confidence would evaporate and markets would tend to collapse." The comments also warn, "This loss of faith in markets would thereby undermine reliability."[14] These initial assessments indicate that the NOPR represents an existential threat to wholesale markets as they currently operate.

Further, as envisioned, distortions in wholesale markets as a result of the NOPR would have direct consequences for our businesses. Specifically, in addition to our perspective as consumers highly dependent on a reliable, resilient, and affordable supply of electricity, our companies are also active participants in the wholesale electricity system, pursuing clean energy projects to meet our corporate energy and sustainability targets and to control our electricity costs. In the competitive wholesale markets regulated by FERC, we are taking full advantage of the choice afforded to us as customers to pursue long-term contracts with clean energy installations. By inserting new cost-based rates into existing wholesale markets, and by providing cost-of-service

[12] Lucas Bifera, *Wall Street Views DOE Grid Proposal as Anti-competitive,* (Oct. 2, 2017) available at *https*://marketintelligence.spglobal.com/our-thinking/news/wall-street-views-doe-grid-proposal-as-anticompetitive.

[13] *Id.*

[14] Comments of the Bipartisan Former FERC Commissioners in Docket No. RM18-1-000 (Oct. 19, 2017), available at https://s3.amazonaws.com/dive_static/paychek/Comments_of_BFFC_Docket_RM18-1_1.pdf.

support for uneconomic units without material benefit to the energy system, the proposed NOPR would create distortionary effects that will directly harm our existing energy supply contracts and limit our ability to pursue such transactions in the future.

Instead of a solution that singles out specific technologies on the basis of a single characteristic (onsite fuel storage capability) with unproven benefits to the energy system, any effort to further strengthen grid reliability and resilience should make use of market principles to encourage innovation and competition, calling upon the full suite of available options and allowing cost and performance to serve as the metric for success.

C. The AE Buyers Group—all of whom are sophisticated consumers that are active participants in the electricity system and highly dependent on reliable and resilient electricity—do not see any evidence of a reliability and resilience "emergency."

Members of the AE Buyers Group include technology companies, manufacturers, and retailers—all sectors heavily reliant upon a reliable and resilient source of electricity. Our companies require a steady supply of electricity on a 24-hour basis, 365 days a year, and we pay a significant price for breaks in service, whether they be small disturbances to the distribution system or large outages of the bulk power system ("BPS"). Estimates place the cost of infrastructure failures for large enterprises at $100,000 per hour, and for many of our businesses the costs are much higher.[15]

Given our dependence upon reliable and resilient electricity, and the consequences to our businesses of a loss of electricity supply, we have become sophisticated consumers and energy market participants who carefully monitor and analyze any threats to this supply. While there can always be incremental improvements in reliability and resilience, it is our view as engaged and

[15] Eaton, *Blackout Tracker: United States Annual Report 2016* (2017), available at http://electricalsector.eaton.com/forms/BlackoutTrackerAnnualReport, at 6.

highly invested consumers that the reliability and resilience of the electricity system is not in a state of emergency.

The electricity sector is certainly in transition, with new generation dominated by additions of natural gas combined cycle facilities and renewable energy facilities, and retirements dominated by coal- and nuclear power plants. However, grid operators and regulators are well equipped to handle this transition and are already making improvements to reliability and resilience. Specifically, we find DOE's concern that fuel supply issues create an immediate threat to the reliability and resilience of the electricity system to be unfounded for three main reasons, as described below.

1. **Reliability assessments from numerous national and regional experts demonstrate that the system is responding well to changes in the resource mix.**

Numerous recent assessments of the reliability and resilience of the BPS—including assessments cited in DOE's NOPR—have concluded that the state of the electricity system is sound, and that it is successfully adjusting to a shifting resource mix. A summary document sent to DOE by the North American Electric Reliability Corporation ("NERC") in May, which has since been made public, describes some of the challenges facing the electric grid, but does not identify a reliability or resilience crisis in need of emergency, out-of-market action.[16] In fact, NERC's overarching conclusion is that the state of the electricity system is sound; Gerry Cauley, President and Chief Executive Officer of NERC, recently testified before the House Subcommittee on Energy saying that "even with all the changes underway, the BPS remains

[16] NERC, *Letter to Secretary Rick Perry*, (May 9, 2017), available at https://www.eenews.net/assets/2017/10/03/document_ew_01.pdf.

highly reliable and resilient, showing improved reliable performance year over year."[17] He also expressed confidence that the system would continue to perform well despite changes to the generation mix, stating, "With appropriate insight, careful planning, and support, I am confident the electricity sector will continue to navigate these changes in a manner that results in enhanced reliability and resilience."[18]

NERC's conclusion that there is no reliability or resilience emergency is consistent with other assessments of the reliability and resilience of the electric grid, including a recent report by DOE itself. In August, DOE released the *Staff Report on Electricity Markets and Reliability* ("DOE Staff Report") which concluded that "reliability is adequate today despite the retirement of 11 percent of the generating capacity available in 2002, as significant additions from natural gas, wind, and solar have come online since then."[19]

Regional reliability organizations have done similar analyses with similar conclusions. Notably, in testimony before Congress in July, all the wholesale market operators stated that their markets are functioning well and that reliability is being maintained.[20] A senior executive from PJM, the organized market most impacted by this rule, told Congress that "investors are investing, consumers are enjoying the lowest electricity prices, and our system is more diverse

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[17] Gerry W. Cauley, Direct Testimony before the Subcommittee on Energy, House Committee on Energy and Commerce, "Powering America: Defining Reliability in a Transforming Electricity Industry" (Sept. 14, 2017), available at http://www.nerc.com/news/Documents/HEC9-14-17%20Cauley%20Testimony%20Final.pdf, at 1.

[18] *Id.*

[19] Department of Energy, *Staff Report to the Secretary on Electricity Markets and Reliability*, 63-64 (August 2017) available at https://energy.gov/sites/prod/files/2017/08/f36/Staff%20Report%20on%20Electricity%20Markets%20and%20Reliability_0.pdf.

[20] United States Congress, House Energy and Commerce Committee, *Powering America: A Review of the Operation and Effectiveness of the Nation's Wholesale Electricity Markets* (July 26, 2017), transcript available at http://docs.house.gov/meetings/IF/IF03/20170726/106323/HHRG-115-IF03-Transcript-20170726.pdf.

and reliable than it has ever been."[21] Looking forward, PJM has also concluded that the system will maintain reliability and resilience under a range of future generation mixes.[22] Heading into the winter season, FERC staff and regional grid operators confirmed just last week that the electricity system is well equipped to maintain reliable service.[23]

2. There are significant ongoing efforts at the federal, regional, and state level to ensure continued reliability.

While the reliability and resilience of the electricity system is currently sound, improvements can always be made, and investments and adjustments are always needed to ensure that the system continues to perform well. However, at this time we are confident that individual entities (such as utilities and system operators), organizations (such as NERC), and agencies (such as FERC and state commissions) with direct responsibility to maintain and improve reliability and resilience have the tools they need to plan for and execute necessary investments and adjustments in a timely and cost-effective manner.

Utilities and system operators already plan for and invest heavily in preventing interruptions in power service on "black sky" days, or days in which the grid is threatened by an extreme natural or man-made disaster. These investments in hardening the grid for different kinds of extreme weather events must be balanced against the costs and probability of rare events occurring, and they also necessarily vary by region. For example, transmission owners install poles made of reinforced concrete, which can withstand high-speed winds better than wooden poles. Asset owners coat transmission, distribution, and power plant equipment with hydrophobic material to repel water and reduce ice build-up during extreme cold and flooding.

[21] *Id.*, at 53.

[22] PJM, *PJM's Evolving Resource Mix and System Reliability,* (March 30, 2017), at 5.

[23] FERC, *Winter 2017-18 Energy Market Assessment,* Docket No. AD06-3, Item No. A-3 (Oct. 19, 2017), available at https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2017/10-19-17-A-3.pdf.

Transmission developers can build redundant power lines, invest in smart grid technologies, or bury the most vulnerable or valuable power lines underground. Planners can site critical infrastructure in locations less susceptible to flooding. Electric grid operators also coordinate with other critical infrastructure operators to ensure that related infrastructure is operational during a "black sky" day. In addition to these types of investments, grid operators and regulators also make extensive plans to restore power after "black sky" days, another important function of a resilient electricity system. They place worker crews on call, enter mutual assistance agreements with neighboring utilities and grid operators that allow them to utilize support crews from unaffected regions, and stockpile replacement equipment and fuel.[24]

The Commission and the RTOs and ISOs have existing tools to ensure that the competitive electricity markets continue to maintain and improve reliability and resilience, including some market reforms that have not yet been fully implemented. The Commission has opened dockets and issued Orders to improve reliability and resilience outcomes in wholesale electricity markets. In addition, the Commission has already proposed a number of price formation rulemakings, many of which have already been finalized as orders, to ensure markets are properly valuing reliability and sending efficient price signals. DOE mentions some of these activities in the NOPR, but does not discuss why it views the Commission's existing and ongoing actions as inadequate to address reliability and resilience, nor does it explain how the NOPR would make up for specific gaps.[25]

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[24] *See* Bill Kelbaugh, PECO, "Overview of the Electric Power Industry's Mutual Assistance Process," available at http://www.energypa.org/assets/files/2014/May%202014%20presentation%20papers/Overview%20Electric%20Power%20Industry's%20Mutual%20Assistance%20Process-Kelbaugh.pdf.

[25] NOPR at 8-10.

At the regional level, ISOs and RTOs are also working to address system resilience. An analysis by PJM released in March analyzed the resilience attributes of the system and asked forward-looking questions such as, "How should resilience be defined and measured as part of planning and operations?"[26] Significant steps have already been taken. For example, new capacity market reforms in PJM and ISO New England ("ISO-NE") impose strict performance requirements to give resources participating in capacity markets a stronger market signal to invest in needed fuel supply arrangements. These rules aim to increase resilience by ensuring that needed units will be able to provide electricity when called upon.[27] These recent steps to improve grid resilience are reflected in the *2017-18 Winter Energy Market Assessment* presented by FERC staff to the Commission last week. In support of an overall conclusion that the grid is well prepared for the coming winter, staff noted:

> Since the extreme winter events of 2014, grid operators in the East have paid closer attention to winter readiness and reliability. For example, PJM and ISO New England continue to phase in performance requirements for capacity resources and the RTOs and ISOs have initiated other programs and procedures that focus on winter readiness.[28]

Generators have already taken a range of different steps to improve resilience in response to market signals and new performance rules, including planning to firm their fuel supply, investing in dual-fuel capability, and investing in better weatherization of equipment. For example, ISO-NE has implemented market designs to encourage the development of dual fuel capability at gas-fired units, which involves storage of oil on site for availability during winter peak conditions

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[26] PJM Interconnection, *PJM's Evolving Resource Mix and System Reliability* (Mar. 2017), available at http://www.pjm.com/~/media/library/reports-notices/special-reports/20170330-pjms-evolving-resource-mix-and-system-reliability.ashx.

[27] *See PJM Interconnection, L.L.C.*, 151 FERC ¶ 61,208 (2015), *order on reh'g*, 155 FERC ¶ 61,157 (2016); *ISO New England Inc.*, 147 FERC ¶ 61,172 (2014), *reh'g denied*, 153 FERC ¶ 61,223 (2015).

[28] FERC, *Winter 2017-18 Energy Market Assessment,* Docket No. AD06-3, Item No. A-3 (Oct. 19, 2017), available at https://www.ferc.gov/market-oversight/reports-analyses/mkt-views/2017/10-19-17-A-3.pdf.

and contracting for guaranteed liquefied natural gas ("LNG") storage for the same purpose.[29] New England has taken a number of other steps to ensure that the region maintains power system reliability despite a significant dependence on gas-fired generation. These include better coordination between natural gas and electricity providers, pipeline capacity forecasting tools, and market design changes that, among other things, provide market incentives for fuel assurance. Despite frequent references to the 2014 Polar Vortex in the NOPR, there is no discussion of improvements to system resilience that have been implemented in its wake—improvements that have already equipped the system to better respond to future events.

In addition, every RTO and ISO already has authority to enter into a Reliability Must Run ("RMR") agreement to provide cost recovery to any generator deemed necessary to maintain grid reliability. This case-by-case assessment ensures that such out-of-market support is available only to units that have announced their planned retirement, and is given only to units that are required for reliable operations. It is unclear why the sweeping action of the NOPR is needed given this existing authority that allows grid operators to provide out-of-market support in specific cases.

The DOE NOPR fails to acknowledge or propose utilization of any of these planning tools or publicly available analyses that are currently in place in many FERC-jurisdictional markets and available as methodologies to continue improving reliability and resilience. The NOPR also ignores efforts currently underway at the federal, regional, and state level. This leaves many unanswered questions regarding the rationale behind the NOPR, as well as the method of improving reliability and resilience that it puts forward. While there can always be further

[29] Paul Hibbard, Susan Tierney, and Katherine Franklin, *Electricity Markets, Reliability, and the Evolving U.S. Power System,* Analysis Group (June 2017), available at http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf.

improvements in reliability and resilience, we are assured by mechanisms already in place and efforts underway, and we are confident that the system will continue to evolve and adjust to meet our needs.

3. There is no evidence that a shortage of long-term fuel supplies has a significant impact on reliability and resilience.

In addition to our confidence in the current and future state of the electricity system and the planning that goes into making it secure and resilient, the AE Buyers Group does not share DOE's specific concern regarding the resilience implications of a decline in facilities with long-term onsite fuel supply. DOE's NOPR cites multiple recent examples of events that caused the grid to be threatened or compromised, namely the Polar Vortex, Superstorm Sandy, and Hurricanes Harvey, Irma, and Maria, stating that devastation from these events "reinforces the urgency that the Commission must act now."[30] However, these storms fail to justify the specific action that DOE recommends; we are not aware of any circumstances in which the availability of additional facilities with long-term onsite fuel supply would have avoided disruptions in power during these events (and we note that DOE cites none in the NOPR). Moreover, DOE ignores the many instances where onsite fuel supply has made capacity resources *more* vulnerable, and DOE has failed to recognize the resilience benefits other types of resources have provided during the same events.

Disruptions in electricity supply are very rarely the result of a lack of adequate fuel supply even during extreme weather events. Most power outages are the result of damage to distribution and transmission equipment or mechanical failures. As DOE reported in the 2015 Quadrennial Energy Review Report, the biggest threat to grid reliability and resilience is to transmission and

[30] NOPR at 11.

distribution infrastructure.[31] This is consistent with a recent Rhodium Group analysis of U.S. Energy Information Administration (EIA) data that found only 0.00007% of outage hours in the last five years were the result of fuel supply disruptions.[32]

The relative rarity of fuel supply-related outages is reflected in the recommendations of a comprehensive assessment of the nation's resilience, ordered by Congress in its 2014 appropriations to DOE and published by the National Academies of Sciences, Engineering, and Medicine in 2017.[33] Acknowledging that "[n]o single entity is responsible for, or has the authority to implement, a comprehensive approach to assure the resilience of the nation's electricity system," the report argues, "the United States needs a process to help all parties better envision the consequences of low-probability but high impact events." Rather than a single solution, the report envisions a strategic, multi-faceted approach that involves multiple state, regional, and federal agencies and organizations. The report concludes with a series of specific recommendations, none of which indicate a need to incentivize the development of onsite fuel supply.[34]

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[31] DOE, *Quadrennial Energy Review,* Chapter II: Increasing the Resilience, Reliability, Safety, and Asset Security of TS&D Infrastructure (Apr. 2015), available at https://www.energy.gov/sites/prod/files/2015/08/f25/QER%20Chapter%20II%20Resilience%20April%202015.pdf.

[32] Trevor Houser, John Larsen, Peter Marsters, "The Real Electricity Reliability Crisis," Rhodium Group (Oct. 3, 2017), http://rhg.com/notes/the-real-electricity-reliability-crisis.

[33] National Academies of Sciences, Engineering, and Medicine, Enhancing the Resilience of the Nation's Electricity System (2017) Washington, DC: The National Academies Press, available at https://doi.org/10.17226/24836.

[34] *Id.* The report makes seven primary recommendations, directed at different federal, regional, and state agencies and organizations, mostly focused on preparedness, analysis, and coordination: (1) "conduct more regional emergency preparedness exercises," (2) "implement resilience-enhancing technical capabilities and operational strategies," (3) "sustain and expand the substantive areas of research, development, and demonstration," (4) "substantially increase the resources committed to the physical components needed to ensure that critical electric infrastructure is robust," (5) "carry out a program of research, development, and demonstration activities to improve the security and resilience of cyber monitoring and controls systems," (6) "establish and support a "visioning" process with the objective of systematically imagining and assessing plausible large-area, long-duration grid disruptions that could have major economic, social, and other adverse consequences," (7A) "establish small system resilience groups," (7B) "create a committee to provide guidance to state regulators on how best to respond to identified local and regional power system-related vulnerabilities," and (7C) "establish a standing capability [at the

Experience from the recent extreme weather events cited in the NOPR further demonstrates that damage to distribution and transmission equipment or mechanical failures are the primary threats to resilience, and that onsite fuel supplies are either vulnerable or unhelpful in improving resilience.

EIA reported that during **Hurricane Harvey,** which caused substantial power outages affecting over a quarter million people, "Power plant outages were largely caused by rain or flooding affecting generator fuel supplies, outages of transmission infrastructure connecting generators to the grid, and personnel not being able to reach generating facilities."[35] The W.A. Parish coal-fired power plant, operated by NRG, was forced to switch two of its units to natural gas fuel for the first time since 2009 because external coal piles became so saturated with water that they were unusable.[36]

During **Hurricane Irma,** it was primarily wind damage to the transmission system, damage to substations, and other wind-related damage that caused widespread outages.[37] During the storm, EIA reported, "One reactor at the Turkey Point nuclear power plant in south Florida was shut down as a precaution before the hurricane arrived. The other nuclear reactor at the plant was

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state level] to identify vulnerabilities, identify strategies to reduce local vulnerabilities, develop strategies to cover costs of needed upgrades, and help the public to become better prepared for extended outages."

[35] U.S. EIA, "Hurricane Harvey caused electric system outages and affected wind generation in Texas" (Sept. 13, 2017), https://www.eia.gov/todayinenergy/detail.php?id=32892.

[36] Platts, "Harvey's rain caused coal-to-gas switching: NRG Energy" (Sept. 27, 2017), https://www.platts.com/latest-news/electric-power/houston/harveys-rain-caused-coal-to-gas-switching-nrg-21081527.

[37] Justine Griffin and Caitlin Johnston, "Irma causes one of the largest disaster power outages in the nation," Tampa Bay Times (Sept. 13, 2017), http://www.tampabay.com/news/business/energy/nearly-a-million-tampa-bay-residents-still-without-power-after-irma/2337158.

later shut down because of a mechanical issue." Florida's other nuclear plant operated at a reduced capacity.[38]

Similarly, **Hurricane Maria** caused damage to the transmission grid that prevented power plants from producing and delivering power, even while power plants themselves remained largely undamaged during the storm.[39]

During **Superstorm Sandy,** damage to the grid was caused by wind, rain, snow, and flooding to transmission lines, substations, and transformers, and even a substation explosion in Manhattan.[40] Restoring power to 632,000 Long Island customers, who lost power for 337 hours during the largest outage during the storm, required replacing 4,500 poles, 2,100 transformers, 400 miles of wire, and 44 substations.[41]

The 2014 **Polar Vortex,** which is widely cited in DOE's report, featured extreme cold temperatures that caused a winter-record demand for electricity while also contributing to the failure of 22 percent of the generation in the PJM region. An assessment of the event by NERC found that, of unplanned power plant outages, coal plants accounted for 26 percent and natural gas 55 percent of the total.[42] Outages due to extreme cold were caused by the freezing of on-site fuel supplies like coal piles, frozen control and sensor equipment, and the inability to receive fuel

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[38] U.S. EIA, "Hurricane Irma cut power to nearly two-thirds of Florida's electricity customers" (Sept. 20, 2017), https://www.eia.gov/todayinenergy/detail.php?id=32992.

[39] Rachel Becker, "After Hurricane Maria, what will it take to turn Puerto Rico's power back on?" The Verge (Sept. 25, 2017), https://www.theverge.com/2017/9/25/16362410/hurricane-maria-puerto-rico-power-outages-electrical-grid-destroyed.

[40] Brian Warmoth, "Con Ed substation experiences explosion, Manhattan power restoration could take a week," Utility Dive (Oct. 30, 2012), http://www.utilitydive.com/news/con-ed-substation-experiences-explosion-manhattan-power-restoration-could/68159/.

[41] Roger Riddell, "The 10 longest power outages of 2012," Utility Dive (Jan. 23, 2013), http://www.utilitydive.com/news/the-10-longest-power-outages-of-2012/92756/.

[42] NERC, *Polar Vortex Review* (Sept. 2014) available online at http://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf.

from outside providers due to natural gas pipelines constraints.[43] While natural gas pipeline constraints played a role in stressing the system, those coal and nuclear units that experienced mechanical failures could not utilize their fuel stock piles to perform a resilience function. Wind and demand response resources bolstered system resilience, providing reliable capacity until more normal system conditions could be restored, as demonstrated by PJM and NERC assessments after the event.[44]

As customers highly dependent on an uninterrupted supply of electricity, we support prudent investments to improve the reliability and resilience of the electricity system. However, recent assessments of the reliability and resilience of the electric grid, current and planned efforts of grid operators to adjust to a changing resource mix, and the overwhelming evidence from recent major outage events all strongly indicate that DOE's proposal to improve reliability and resilience by providing cost-of-service regulation to generators that stockpile fuel supply onsite will not have a significant impact on system reliability and resilience.

D. There are many solutions available to improve the reliability and resilience of the electric grid, and a cost-effective approach to improving reliability and resilience will take advantage of them all.

[43] *Id.;* see also, PJM Interconnection. *Response to Consumer Reports on 2014 Winter Pricing* (19 Sept. 2014) available online at http://www.pjm.com/~/media/documents/reports/20140919-pjm-response-to-consumer-reports-on-2014-winter-pricing.ashx.

[44] PJM Interconnection, *Analysis of Operational Events and Market Impacts During the 2014 Cold Weather Events* (May 8, 2014), http://www.pjm.com/~/media/library/reports-notices/weather-related/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx, page 20*;* NERC, *Polar Vortex Review* (Sept. 2014) available online at http://www.nerc.com/pa/rrm/January%202014%20Polar%20Vortex%20Review/Polar_Vortex_Review_29_Sept_2014_Final.pdf; Michael Goggin, "Wind power once again saves millions by keeping energy prices in check during cold snap," American Wind Energy Association (Jan. 24, 2014), http://www.aweablog.org/wind-power-once-again-saves-millions-by-keeping-energy-prices-in-check-during-cold-snap/; American Wind Energy Association, *Wind energy saves consumers money during the polar vortex* (Jan. 2015), available at http://awea.files.cms-plus.com/AWEA%20Cold%20Snap%20Report%20Final%20-%20January%202015.pdf.

While the AE Buyers Group has no reason to believe that the electricity system is currently facing a reliability and resilience emergency, we note that there are many available solutions to make the electricity system not only more reliable and resilient, but also more secure, responsive, innovative, and affordable. These technologies and services include microgrids, advanced metering, distributed energy resources, energy storage, demand response, and smart grid technologies like synchrophasors and distribution automation. All of these solutions and many others—including operational changes and emerging technologies—have an important role to play in the reliability and resilience of our future electricity system, but they are all overlooked by DOE's proposal. By excluding available solutions, the NOPR will not produce efficient or cost-effective reliability and resilience improvements.

Importantly, we note that many different solutions played a key role in strengthening the resilience of the grid during the recent extreme events cited in the NOPR. As noted above (see III.C.3.), wind and demand response resources bolstered system resilience during the 2014 Polar Vortex, and during Hurricane Irma in Tampa Electric ("TECO") dispatched 40 megawatts of demand response resources while it restored parts of the transmission and distribution network.[45] The EIA credited specific investments by utilities for preventing worse damage during Hurricane Irma, including deployment of smart grid technologies to "provide more timely and more accurate information about outages…. [to] help utilities better target restoration efforts.[46]

Even with regard to specific concerns around fuel security, the NOPR takes an unnecessarily narrow view, focusing only on onsite fuel storage. Potomac Analytics, the Independent Market

[45] Sarah McAuley, "Following Hurricane Irma, Demand Response Stepped Up Amid Efforts to Restore Power," EnerNOC (Sept. 26, 2017), https://energysmart.enernoc.com/following-hurricane-irma-demand-response-stepped-amid-efforts-restore-power.

[46] U.S. EIA, "Hurricane Irma cut power to nearly two-thirds of Florida's electricity customers" (Sept. 20, 2017), https://www.eia.gov/todayinenergy/detail.php?id=32992.

Monitor for PJM, points to several solutions to consider when addressing fuel security, including "the reliability of the [natural gas] pipelines, the compatibility of the gas pipeline regulated business model with long term guaranteed contracts and the merchant generator market business model, the degree to which electric generators have truly firm gas service and the need for a gas RTO to help ensure reliability.[47] None of these steps is considered in the NOPR.

In its assessment of electricity system resilience discussed above, the National Academies of Sciences, Engineering, and Medicine warned: "The system's reliability and resilience can be improved but never made perfect. Thus, system owners, operators, and regulators must prioritize their investments based on potential benefits."[48] The NOPR chooses to prioritize onsite fuel supply without considering other options, and fails to prove that this approach is the most efficient and effective step to improve grid resilience.

As customers, we are committed to playing a role in strengthening the grid, and we have been very active at the regional and local level in deploying technologies and participating in programs and services that will improve reliability and resilience while bringing other benefits. We can often save money by investing in technologies or services such as energy storage and demand response that will improve the reliability and resilience of the grid.

Targeted deployment of these and other technologies—including but not limited to installations by customers like our businesses—is key to maintaining reliability and resilience as our electricity system continues to evolve. The NOPR, however, fails to account for the resilience benefits they provide. Any steps taken by the Commission to improve reliability and

[47] *Id*.

[48] National Academies of Sciences, Engineering, and Medicine, Enhancing the Resilience of the Nation's Electricity System (2017) Washington, DC: The National Academies Press, available at https://doi.org/10.17226/24836.

resilience must take into account the full range of solutions available, to avoid unduly favoring specific technologies or solutions and to ensure least-cost outcomes.

IV. CONCLUSION

As major corporations and large energy users, members of the AE Buyers Group are supportive of efforts to improve the reliability and resilience of the electricity system. However, we are extremely concerned that DOE's NOPR does not represent an effective means to this end.

There are many unanswered questions about how the NOPR would be finalized and implemented in the wholesale markets, and the very short turnaround for comments in this proceeding that has afforded little time to assess how the market might react to different potential implementation scenarios. This uncertainty and the proposed timeline for implementation are themselves very troubling to our companies, particularly given the magnitude of the change that DOE's proposal would enact.

However, what is certain from the NOPR is that a Grid Pricing Rule in line with DOE's proposal would undermine the core functionality of wholesale markets, eroding competition and imposing burdensome out-of-market costs on consumers like our companies, without providing material improvements in reliability and resilience to the energy system. Further, we note that the DOE's proposed justification for the NOPR—namely that a reliability "emergency" must be addressed immediately—is at odds with factual analysis and evidence of the reliability of the current U.S. electric grid. The AE Buyers Group strongly urges FERC to decline to finalize the NOPR.

Respectfully submitted,

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