

**BEFORE  
THE UNITED STATES DEPARTMENT OF ENERGY**

**REQUEST OF FIRSTENERGY SOLUTIONS )  
CORPORATION FOR EMERGENCY ORDER ) DOCKET NO. EO-18-  
PURSUANT TO FEDERAL POWER ACT )  
SECTION 202(C) SUBMITTED MARCH 29, )  
2018 )**

**COMMENTS OF MURRAY ENERGY CORPORATION IN  
SUPPORT OF REQUEST FOR EMERGENCY ORDER AND MOTION TO  
INTERVENE**

**I. STATEMENT OF SUPPORT**

On March 29, 2018, FirstEnergy Solutions Corporation (“FirstEnergy Solutions”), on behalf of its named subsidiaries, requested that the Secretary of Energy (“Secretary”) find that an emergency condition exists in the footprint of the PJM Interconnection L.L.C. (“PJM”) which requires immediate intervention by the Secretary in the form of a Section 202(c) emergency order. The request is made pursuant to Section 202(c) of the Federal Power Act (“FPA”), 16 U.S.C. §824a(c), Section 301(b) of the Department of Energy (“DOE”) Organization Act, 42 U.S.C. §7151(b), and certain of DOE’s Rules of Practice and Procedure, 10 CFR §§205.370-205.373. FirstEnergy Solutions requests a Section 202(c) emergency order directing: “(a) certain existing nuclear and coal-fired generators in PJM, as detailed herein, to enter into contracts and all necessary arrangements with PJM, on a plant-by-plant basis, to generate, deliver, interchange, and transmit electric energy, capacity, and ancillary services as needed to maintain the stability of the electric grid and (b) PJM to promptly compensate at-risk merchant nuclear and coal-fired power plants for the full benefits they provide to energy markets and the public at large, including fuel security and diversity, as detailed herein.”

Murray Energy Corporation (“Murray Energy”) is the largest underground coal mining company in the United States and the largest employer of coal workers in the United States in the underground mining industry, with over 5,600 employees. Murray Energy and its subsidiary companies currently operate fifteen (15) coal mines, consisting of eleven (11) underground longwall mining systems and forty-six (46) continuous mining units in Ohio, Illinois, Kentucky, Utah and West Virginia. Murray Energy produces approximately 75 million tons of bituminous coal each year. It supplies coal to many of the largest coal-fired utility generating facilities in the U.S., and specifically within the PJM footprint. Notably, Murray Energy supplies coal for use in electricity production at FirstEnergy Solutions’ W. H. Sammis and Bruce Mansfield plants.

Murray Energy strongly and enthusiastically supports FirstEnergy Solutions’ request for a Section 202(c) emergency order. FirstEnergy Solutions’ March 29, 2018 request makes a compelling and well-documented case for the emergency order. The relief requested is within the Secretary’s legal authority under Section 202(c) and is justified under the dire and extreme circumstances that threaten the continued viability of baseload, coal fired generation in the PJM footprint, the safety and reliability and economics of the PJM regional grid and the Nation’s vast coal resources in the Midwest.

To the extent appropriate, Murray Energy also moves to intervene in this matter.

## **II. MURRAY ENERGY’S VITAL INTEREST IN THIS ACTION**

President Trump has vowed to preserve coal jobs and low-cost, reliable and fuel source electricity for all Americans, including retirees on fixed incomes, single mothers, and manufacturers who depend on low-cost electricity to produce their products. On March 28, 2017, President Trump issued his Energy Independence Executive Order 13783 which affirms the “national interest to provide clean and safe development of our Nation’s vast energy

resources, while at the same time avoiding regulatory burdens that unnecessarily encumber energy production, constrain economic growth, and prevent job creation.” Executive Order 13783, Section 1(a). Executive Order 13783 specifically directed the U.S. EPA to review and initiate reconsideration proceedings to “suspend, revise, or rescind” the Obama Clean Power Plan as appropriate and consistent with law.” *Id.*, Section 4(a) – (c). In response, the U.S. EPA has proposed the repeal of the Obama Clean Power Plan in Docket No. EPA-HQ-OAR-2017-0355. Murray Energy supports the U.S. EPA action as a necessary and well-deserved first step to protect and preserve coal-fired, baseload generation and to promote the national interest in the Nation’s vast coal resources.

However, the U.S. EPA’s first step in Docket No. EPA-HQ-OAR-2017-0355 to repeal the Obama Clean Power Plan will go for naught unless federal agencies take a concerted, coordinated and aggressive course of action to protect and preserve the Nation’s valuable coal-fired and nuclear generation capacity, including most notably that within the Midwest and the PJM grid, a regional grid that serves a significant proportion of the Nation’s industrial, commercial, residential and national defense electricity consumers that depend upon a safe, reliable, and economic source of electricity generation.

Murray Energy has a vital interest in FirstEnergy Solutions’ request for an emergency order under Section 202. Murray Energy was established in 1988 when Mr. Robert E. Murray mortgaged virtually everything he owned and purchased a single coal mine in Southern Ohio. Thirty years later, Murray Energy is the largest underground coal mining company in the U.S. As stated, Murray Energy is the largest employer of coal workers in the United States in the underground mining industry, with over 5,600 employees. Murray Energy and its subsidiary companies currently operate fifteen (15) coal mines, consisting of eleven (11) underground

longwall mining systems and forty-six (46) continuous mining units in Ohio, Illinois, Kentucky, Utah, and West Virginia. Murray Energy produces approximately 75 million tons of bituminous coal each year and supplies coal to many of the largest coal-fired electric utility generating facilities in the United States.

Murray Energy is also engaged in related business operations and activities, including owning and operating four (4) mining equipment manufacturing and rebuild facilities along with a number of river, truck and rail terminals, and twenty-five (25) river towboats and over 500 coal barges on the inland waterway system. Many of Murray Energy's mining complexes are strategically located near its customers' electric generating stations, and all have excellent, low cost transportation infrastructures to Murray Energy's markets. The vast majority of the coal produced from Murray Energy's mines in the U.S. is used for the generation of electricity. Murray Energy is dependent on the continuing viability and operation of coal-fired generation in the United States.

Murray Energy specifically supplies coal to FirstEnergy Solutions' W.H. Sammis and Bruce Mansfield plants and Allegheny Energy Supply Company's Pleasants Power Station. Murray Energy is under contract to provide 6,500,000 tons of coal per year to the W.H. Sammis and Bruce Mansfield plants through 2028<sup>1</sup>. Murray Energy is also under contract to provide 250,000 tons of coal to the Pleasants Power Station in 2018.

Given the current threats to coal-fired generation, Murray Energy, along with other coal producers and related industries, and numerous generating companies and electric utilities, are threatened with bankruptcy and significant economic harm if coal-fired capacity is forced out of the market and prematurely closed. Under the Obama Administration, over 531 coal-fired

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<sup>1</sup> Murray Energy received a Notice of Reduction in Generation Capacity from FirstEnergy Generation, LLC dated March 23, 2018 stating that the 2018 tonnage will be reduced from 6,500,000 to 2,200,000 tons.

generating plants, or 59,000 megawatts of generating capacity through 2016, were closed prematurely, many as a result of new and potential regulations that were put into place illegally, without proper cost analysis, and without proven environmental benefits. Further, an additional 12,700 megawatts of coal fired-generation will be closed by the end of 2020, bringing coal's share of electricity to as low as twenty-seven percent (27%). These closures are the functional equivalent of entirely eliminating the combined electricity supplies of Ohio, Pennsylvania, Indiana, and West Virginia. In the PJM footprint alone, which covers all or part of thirteen (13) states and sixty-five (65) million people, 11,000 megawatts of coal-fired electricity generation has been closed over the past four (4) years. In addition, 20,056 megawatts of this baseload capacity in PJM is contemplated for closure.

This devastation has had, and will continue to have, far-reaching consequences for the United States. As well documented by FirstEnergy Solutions, numerous coal-fired and nuclear plants in PJM have announced that they are financially challenged and are closing or contemplating closure. FirstEnergy Solutions itself has now filed for bankruptcy. By early 2016, the total value of the American coal industry had declined from \$68.8 billion five (5) years before to \$4.08 billion, a ninety-four percent (94%) reduction in value. A total of fifty-two (52) coal companies were in bankruptcy proceedings with only four (4) major companies remaining financially solvent. Local rural communities in coal producing regions, and in areas that depend on coal-fired power plants, are losing jobs and millions of dollars in local tax support due to the closure of coal-fired generation plants. This devastates the residents and the employees supporting local businesses, governments, and school districts.

Given the dire and extreme circumstances fully documented in FirstEnergy Solution's March 29, 2018 request for emergency order, it is absolutely imperative that the Secretary immediately issue the requested Section 202 emergency order.

### **III. THE SECRETARY HAS THE LEGAL AUTHORITY TO ISSUE THE REQUESTED SECTION 202 EMERGENCY ORDER**

Pursuant to Section 202(c) of the Federal Power Act (16 U.S.C. §824a (c)), the Secretary of the U.S. Department of Energy has the authority, whenever the Department determines that an “emergency exists by reason of . . . a shortage of electric energy or of facilities for the generation . . . of electric energy . . . ,” to issue an emergency order to prevent an electric generation plant from shutting down:

#### **(c) Temporary connection and exchange of facilities during emergency**

1) During the continuance of any war in which the United States is engaged, or whenever the Commission determines that *an emergency exists by reason of* a sudden increase in demand for electric energy, or *a shortage* of electric energy or *of facilities for the generation* or transmission *of electric energy*, or of fuel or water for generating facilities, or other causes, *the Commission shall have authority*, either upon its own motion or upon complaint, with or without notice, hearing, or report, *to require by order such temporary* connections of facilities and such *generation*, delivery, interchange, or transmission *of electric energy* is in its judgment will best meet the emergency and serve the public interest. If the parties affected by such order fail to agree upon the terms of any arrangement between them in carrying out such order, the Commission, after hearing held either before or after such order takes effect, may prescribe by supplemental order such terms as it finds to be just and reasonable, including the compensation or reimbursement which should be paid to or by any such party. (emphasis added).

The Secretary's authority and discretion under Section 202(c) is very broad and the duration for action is not limited. Section 202(c) empowers the Secretary to act “whenever [he] determines that an emergency exists by reason of “certain specified market conditions or other

causes” to order actions “as in [his] judgment will best meet the emergency and serve the public interest.” 16 U.S.C. §824a (c)(1).

DOE’s regulations define emergency broadly, stating that an emergency “can result from a sudden increase in customer demand, an inability to obtain adequate amounts of the necessary fuels to generate electricity, or a regulatory order which prohibits the use of certain electric power supply facilities. 10 CFR §205.371, defines “emergency” and provides:

**§ 205.371 Definition of emergency.** (“Emergency,” as used herein, is defined as an unexpected inadequate supply of electric energy which may result from the unexpected outage or breakdown of facilities for the generation, transmission or distribution of electric power. Such events may be the result of weather conditions, acts of God, or unforeseen occurrences not reasonably within the power of the affected “entity” to prevent. An emergency also can result from a sudden increase in customer demand, an inability to obtain adequate amounts of the necessary fuels to generate electricity, or a regulatory action which prohibits the use of certain electric power supply facilities. Actions under this authority are envisioned as meeting a specific inadequate power supply situation. Extended periods of insufficient power supply as a result of inadequate planning or the failure to construct necessary facilities can result in an emergency as contemplated in these regulations. In such cases, the impacted “entity” will be expected to make firm arrangements to resolve the problem until new facilities become available, so that a continuing emergency order is not needed. Situations where a shortage of electric energy is projected due solely to the failure of parties to agree to terms, conditions or other economic factors relating to service, generally will not be considered as emergencies unless the inability to supply electric service is imminent. Where an electricity outage or service inadequacy qualifies for a section 202(c) order, contractual difficulties alone will not be sufficient to preclude the issuance of an emergency order.)

Section 205.373 specifies the information required to be submitted. FirstEnergy Solutions has more than adequately addressed these requirements at pages 27-31 of the March 29, 2018 request.

#### **IV. FIRSTENERGY SOLUTIONS HAS FIRMLY ESTABLISHED THAT AN EMERGENCY EXISTS UNDER SECTION 202 DUE TO THE RECENT AND IMMINENT CRITICAL REDUCTION IN NUCLEAR AND COAL-FIRED GENERATION CAPACITY**

It is imperative that the Secretary act expeditiously to grant the relief requested by FirstEnergy Solutions to ensure continued operation of a secure and diverse electric generation fleet to secure reliable, efficient and cost-effective supplies of electricity in the PJM footprint.

This action is one of the most important actions presented to the Secretary for his consideration. During the past six years, close to 58,000 MW of highly dependable baseload generating capacity with stable cost structures and on-site fuel supply have been retired. Most of these generating units burned coal, but almost 5,000 MW of nuclear capacity also have been shut down. Prior to retirement, these generating units accounted for eighteen percent (18%) of total baseload generating capacity in the United States, routinely generating 2,555,000 GWh of electricity per year. The replacement cost for this generation is more than \$100 billion. Approximately another 30,000 MW are currently scheduled to be retired. Despite this fact, neither FERC nor PJM have ever systematically examined in depth the impact of these retirements on grid resilience, the vulnerability to severe price spikes, or the ability to keep electricity costs at reasonable levels on a long-term basis.

##### **A. Continued Operation of American's Coal-Fired Electricity Generation Fleet in the PJM Grid is Absolutely Vital to Ensuring Reliable, Efficient and Cost-Effective Supplies of Electricity to the Region**

America enjoys an abundant resource of proven coal reserves. Coal is a critical component of America's energy resources and continued operation of America's coal-fired



electricity generation fleet in the PJM grid is absolutely vital to ensuring reliable, efficient and cost-effective supplies of electricity to the region.

For over a century, coal-fired generation has been the safe, reliable, low-cost, and fuel-secure source of electricity in America, providing the baseload generation, as well as the capacity, reserve, and ancillary services that are absolutely necessary to maintain the integrity and reliability of our Nation's power grids. The historical fleet of coal-fired generating units, particularly in the Midwest, has served the economy well, providing as much as eighty to ninety percent (80 - 90%) of in-state generation in many states over the years. Coal-fired generation has also served the commercial, manufacturing and industrial sectors of this Country, providing low-cost, reliable, high capacity and peak demand services that are absolutely necessary for American manufacturers to operate and to compete in the global marketplace.

Over the years, coal-fired generation has been less susceptible than other sources to both short-term and long-term fuel price variation and supply. Coal-fired generation has been the constant through the years of the Arab oil embargo, the natural gas shortages of the 1970's and 1980's, the ensuing volatility in natural gas prices thereafter, nuclear power regulatory challenges, and extreme weather conditions, most recently the 2014 Polar Vortex and 2018 Bomb Cyclones.

There is no better illustration of the need to protect baseload generation than the so-called "Bomb Cyclone," which immersed the eastern United States in extremely cold, windy conditions from December 27, 2017 through January 8, 2018. Notwithstanding that this cold snap occurred primarily over the holidays, at least two (2) million Americans lost their power, and, tragically, twenty-two (22) people lost their lives. Without the electricity provided by our coal-fired and

nuclear power plants, the devastation of this very short twelve (12) day Bomb Cyclone would have been far worse.

The United States Department of Energy's National Energy Technology Laboratory recently issued a report ("Government Study") analyzing the reliability and resiliency of different sources of electricity generation during the Bomb Cyclone. The Government Study confirmed what many of us have already known, that coal was the single most reliable and resilient form of electricity production during that critical time. Coal and nuclear power provided eighty-nine percent (89%) of the electricity during this Bomb Cyclone. During this time coal-fired generation averaged an output level of 46,038 megawatts, over fifty percent (50%) greater than the average of 29,849 megawatts. Indeed, if it were not for the electricity generated by our Nation's coal-fired power plants, with ample capacity and on-site fuel availability, the grids would have experienced a massive nine (9) to eighteen (18) gigawatts of shortfall, leading to system collapse.

During this cold snap, coal far outperformed all other fuel sources, particularly natural gas and renewables. At least 37,000 megawatts of supposedly available natural gas-powered electricity was entirely unavailable due to the priority for home heating use and frozen natural gas pipelines. Where natural gas was available, prices peaked at over \$95 per million BTU in the PJM, and over \$175 per million BTU in New York City, which is sixty (60) times the normal cost. Also, during this time, the cost of electric power from natural gas-fired plants peaked at over \$500 per megawatt hour, compared to a predominant rate of about \$28 per megawatt hour. The ISO New England regional transmission organization has confirmed that their region is at major risk of fuel insecurity and it currently has no defined solution, due to New England's

dependence on natural gas relying on ‘just in time’ delivery and the retirement of coal and nuclear generating capacity with 70-80 day supply of coal stored in stockpiles on site.

Similarly, wind turbines and solar panels contributed virtually nothing to our Country’s electricity needs at that dire time, as cloud cover and wind speeds caused these resources to be unable to dispatch. The Government Study concluded that wind energy was down twelve-percent (12%) across the eastern United States. When considered together, wind and solar electricity generation declined nineteen percent (19%) in Midcontinent Independent System Operator (“MISO”), twenty-nine percent (29%) in Southwest Power Pool (“SPP”) and thirty-two percent (32%) in Electric Reliability Council of Texas (“ERCOT”). Fortunately, coal-fired electricity was able to step up and to fill the void for seventy-four percent (74%) of this incremental lost generation.

The Government Study valued the resilience provided by coal at \$3.5 billion in the PJM market alone, which equates to \$288 million per day. PJM’s President and CEO, Mr. Andrew Ott, recently stated that 1,410 megawatts of nuclear capacity and 3,688 megawatts of coal-fired capacity that operated during the recent cold snap in the eastern United States are scheduled to be deactivated within the next five (5) years.

These problems from the recent cold snap were not an isolated incident. During the so-called “Polar Vortex” of early 2014, PJM came within 500 megawatts of a major system disruption on a demand of 140,000 megawatts. A total of 9,300 megawatts of supposedly available natural gas-fired generation was not available due to gas supply disruptions to the generators. Further, the cost of producing electricity in the Midwest and Mid-Atlantic area rose above \$1,000 per megawatt-hour for the first time in American history.

During this time, an Ohio-based electric power company was ordered by the State's Public Utility Commission to be connected to 3,800 megawatts of wind and solar power. Only fifteen (15) megawatts of the 3,800 megawatts were available during the crisis. What the utility relied on during the cold snap was 8,170 megawatts of coal-fired generation. As all 8,170 megawatts have been closed, what will happen next time?

The recent Bomb Cyclone and 2014 Polar Vortex demonstrate that our electric power grids are not as resilient and reliable as the independent power grid operators, some electric utilities, and the Federal Energy Regulatory Commission ("FERC") claim. Indeed, we have a power grid reliability and resiliency crisis in much of America. But, will a system collapse occur before they recognize and do something about it?

During the 2018 Bomb Cyclone, the consequence of lack of fuel diversity was seen in New England ISO ("NE ISO") pricing. Comparing the first half of January 2018 to the first half of January 2017, natural gas prices (Algonquin hub) were up from an average of \$5.60 per MMBtu in 2017 to \$22.78 per MMBtu in 2018, a 307 percent increase. Power prices (Mass Hub) were up from an average of \$41.80 per megawatt-hour to \$147.74 per megawatt-hour, a 253 percent increase. Also relevant was the over 7000 percent increase in use of oil for power generation as a result of supply constraints on natural gas due to the lack of storage and pipeline capacity. Dual fuel gas and oil plants had to switch to oil to meet load. Pricing was also up in PJM West, which had an average energy price of \$119.53 per megawatt-hour in the first half of January 2018. The average energy price and price increases were higher in NE ISO than PJM West because the coal generation in PJM increased by about 10 percent in the first half of January 2018 which significantly reduced the increased generation required from oil. There is

no question that had it not been for the coal capacity in PJM, MISO and elsewhere the power prices would have been significantly higher.

As addressed by FirstEnergy Solutions, numerous baseload plants in PJM have announced that they are financially challenged and are closing or contemplating closure. If action is not immediately taken, thousands of additional megawatts of reliable baseload capacity will retire leaving PJM without fuel-secure baseload resources. These closures include:

- FirstEnergy Solutions, which through Applicants indirectly owns 12,300 MW of generation, has now filed for bankruptcy. Multiple plants are at risk for permanent closure as a result of this expected action.
- FirstEnergy Solutions submitted notices to PJM on March 28, 2018, that it would deactivate its three nuclear plants, Davis-Besse (908MW), Perry (1,268 MW), and Beaver Valley (1,872 MW), by 2021.
- FirstEnergy Corp. announced that Units 5-7 at the W.H. Sammis coal-fired plant (1,490 MW) are in danger of being closed. The company previously announced that Units 1-4 (720 MW) will close by May 2020.
- FirstEnergy Corp. has announced that the 2,510 MW Bruce Mansfield coal-fired plant is at risk of closure due to the exposure to changing market conditions.
- Allegheny Energy Supply Company, LLC, a FirstEnergy Corp. subsidiary, recently submitted a deactivation notice for Pleasants Power Station, a 1,300 MW coal-fired plant in West Virginia.
- Dayton Power & Light has announced the closure by June 2018 of the J.M. Stuart coal-fired plant (2,318 MW) and the Killen Station Unit 2 coal-fired plant (600 MW), citing market conditions making the plants not economically viable. Stuart Unit 1 was closed even earlier, on September 30, 2017.
- Owners of the 1,884 MW Homer City coal-fired power plant attempted to sell the plant in 2016, but were unable to find a buyer; Standard & Poor's analysts cite lower power prices and increasing expenses as driving forces behind the facility's ills.
- Westmoreland Partners recently announced the sale or closure of the 209 MW Roanoke Valley coal-fired power plant. As anticipated, on March 1, 2017, these units retired.

- Exelon has announced that it will close the Oyster Creek nuclear plant (608 MW) in October 2018 – a decade before the end of its operating license – citing negative economic factors.
- Exelon has announced the premature closure of the 837 MW Three Mile Island nuclear power plant in September 2018, citing deteriorating economic value.

(March 29, 2018 Request, pp. 20-22)

Renewable energy sources are not a viable or credible alternative to baseload coal-fired generation. Wind and solar generation sources are intermittent and unreliable and therefore cannot be relied upon to meet peak or base load demand. Without the price support provided by the Wind Production Tax Credit, wind generation will be a high cost resource. Natural gas-fired generation is not the answer either, as gas pricing is volatile and gas supply is unreliable given limited gas storage capacity, pipeline limitations and a requirement to meet residential and commercial customer requirements ahead of power generation.

As asserted by FirstEnergy Solutions, PJM itself has recognized the need for resiliency.

Fuel diversity and resiliency are key components of a resilient grid.

PJM itself has recognized the need for resiliency, finding that, “[i]n addition to delivering energy services reliably during strained system conditions, to which probabilities can be attached, e.g., plant outages, weather variability), a resilient energy system also must be resistant to larger scale shocks to which it is difficult to attach probabilities . . . .” PJM recently concluded that “reliability attributes supplied through generation and other resources . . . support reliability” and “the maintenance or assurance of these attributes into the future are important to resilience mitigation.” Fuel diversity and security are key components of a resilient grid. PJM acknowledged the connection between diversity and resiliency when it committed to “analyz[ing] future trends in resource mix and their impacts on both reliability and resilience.” As PJM’s market monitor stated, “[s]ignificant reliance on specific fuels, including nuclear, coal and gas means that markets are at risk from a significant disruption in any one fuel.” (March 29, 2018 Request p, 23).

NERC also recognizes the critical contributions of nuclear and coal-fired generation to the electric grid. As FirstEnergy Solutions states:

NERC goes further, recognizing not only the importance of fuel diversity in maintaining a resilient energy system, but also the critical contributions of nuclear and coal-fired resources to mitigating risks to the electric grid. Overreliance on natural gas, by contrast, *increases* risk to the electric grid because, as NERC states, “within a relatively short time, a major failure” in the natural gas transmission system “could result in loss of electric generating capacity that could exceed the electric reserves available to compensate for these losses.” As explained by Dr. Henry Chao, Executive Advisor and Vice President at Quanta Technology and former Vice President at New York Independent System Operator (“NYISO”): “Abundant supplies of natural gas provide many advantages to electric consumers, but . . . natural gas delivery systems lack the reliability and redundancy of the bulk electric system. Specifically, there are no systematic reliability criteria for natural gas delivery system planning and operations; whereas the electric power industry has mandatory reliability standards that are developed and enforced by NERC.” (March 29, 2018 Request, p. 23)

Murray Energy fully endorses FirstEnergy Solutions’ conclusion that unless immediate action is taken, the continued retirement of nuclear and coal-fired generating units will invariably lead to increased electric price volatility, lessened grid resiliency and dependability, uncertain electric security, economic instability and job losses. FirstEnergy Solutions states it best:

Unless immediate action is taken, the continued retirement of nuclear and coal-fired generating units – by breeding greater dependence on generation fueled by natural gas, which is subject to supply disruptions, constrained pipeline capacity, a general inability to store fuel on-site, and competing demand for consumer heating in winter months – will increasingly result in significant, negative outcomes for the approximately 65 million people living and working within the PJM footprint. These harmful consequences include increased electric price volatility, lessened grid resilience and dependability, uncertain electric security in the future, decreased economic stability, and severe job losses – especially in the coal sector – as both power plants and fuel suppliers declare bankruptcy and cease operations. Combined, these conditions are potentially disastrous for the electric grid and the economy. PJM itself recently found that as the “resource mix moves in the direction of less coal and nuclear generation, generator reliability attributes of frequency response, reactive capability and fuel assurance decrease . . .” (March 29, 2018 Request, p. 24).

**B. At-Risk Merchant Nuclear and Coal-Fired Plans Must Be Compensated For the Benefits of Resiliency and Diversity Provided to the Grid.**

FirstEnergy Solutions is absolutely correct in asserting that at-risk merchant nuclear and coal-fired plants must be compensated for the benefits of resiliency and diversity provided to the grid. Neither FERC nor PJM have addressed these important issues. Further delay will continue to devastate the reliability of the grid and cannot be tolerated.

A recent study performed by the leading global economic consulting firm, IHS-Markit concludes that, on a going forward basis (excluding sunk costs), the costs of continuing to operate many recently-retired coal-fired plants is significantly lower than the long-term marginal cost of building new generation.<sup>2</sup> In some instances, on a properly-calculated apples-to-apples basis, the cost of electricity generated by a newly-constructed power plant may be approximately twice that of a baseload coal or nuclear plant that has recently retired.<sup>3</sup>

Furthermore, baseload coal and nuclear plants typically operate at high capacity factors and have stable operating costs because fuel can be purchased under long-term contracts with fixed pricing. As such, coal plants are valuable assets which limit exposure to price spikes, keep electricity costs at reasonable levels and historically have been the backbone of the operation of the grid. From an economic standpoint, it seldom should make sense to shut down these generating units, especially since, once shut down, these generating units are permanently lost. Yet that is precisely what is occurring today.<sup>4</sup>

A related problem that will worsen with further retirements of baseload coal and nuclear plants will be the increased frequency, severity, and duration of price spikes that will arise with

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<sup>2</sup> IHS Markit, *Ensuring Resilient and Efficient Electricity Generation: The Value of the current diverse US power supply portfolio*, at p. 8 (Sept. 2017) (hereinafter, “IHS Study”).

<sup>3</sup> IHS Study at 36.

<sup>4</sup> Many of the companies that historically have been leaders in electric generation, such as AEP, Duke, NRG and Calpine, have announced that, except for generating units supported by long-term Purchase Power Agreements, they will no longer build new merchant generation and, in several instances, are liquidating their entire merchant generation portfolio. This is reducing the number of experienced players interested in continuing to own and operate generation. In addition, negative energy prices primarily as a result of wind production tax credits are becoming increasingly prevalent, with crushing impacts on every type of base load.



increased dependence upon natural gas. In particular, during the past several years the ability of grid operators to shift back and forth between natural gas-fired generation and coal-fired generation has played an increasingly critical role in managing price volatility. When gas prices rise, coal generation increases; when gas prices fall, coal generation declines. With additional coal plant retirements, however, the ability to reduce gas use by increasing use of coal-fired capacity declines, reducing the amount of available fuel switching by a startling 11 BCF/day in the past six years.<sup>5</sup> As a result, natural gas price increases are expected as coal generation is not available to cap gas demand and price.

Further, the reduced potential for fuel switching is not the only change that is occurring that could cause adverse volatility and price spikes. LNG exports from the U.S. began in earnest in 2016 with the completion of the Sabine Pass facility which reached 2 billion cubic feet per day (“BCFD”) by year end. Another six plus BCFD of LNG capacity is under construction and 13.5 BCFD of LNG capacity is in advanced development.<sup>6</sup> As exports of LNG grow, natural gas pricing is expected to increasingly be affected by the global price, thereby increasing volatility and making it even more important to keep existing coal-fired units online in order to maximize the availability of fuel switching.

IHS calculates that retirement to the existing coal and nuclear generation capacity would result in an increase of retail power prices by about 25 percent and net consumer costs by about \$98 billion per year.<sup>7</sup> Therefore, failure to maintain the resource diversity by prematurely retiring nuclear and coal baseload units could, extrapolating over the next 20 years, increase electricity costs by as much as \$2 trillion. These effects are magnified further as soaring

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<sup>5</sup> ABB. Actual and Projected Coal Capacity Retirements in the United States, 2011-2020, Ventyx Database, October 18, 2017.

<sup>6</sup> EVA, Quarterly LNG Outlook, December 2017.

<sup>7</sup> IHS Study at 5, 37-38.

electricity costs ripple through the broad economy, with large adverse impacts over the three year period on U.S. GDP (a loss of 0.8%), on real disposable income (a drop of about \$845 per household in 2016 dollars), and jobs (a loss of 1 million).<sup>8</sup>

Every time additional coal-fired generation is retired, the vulnerability to frequent and severe natural gas and electricity price spikes rises, since the natural gas price increase required to induce sufficient fuel shifting to balance the market continues to increase. As a result, in any winter as cold or colder as the winter of 2013-14, the potential natural gas price increase required to balance the market could be as much as two to three times as great as in the Polar Vortex winter.

It is a bedrock principle of power supply planning and cost-effective risk management that maintaining resource diversity (creating optionality) has significant, tangible economic value. Putting “all of one’s eggs in one basket” seldom makes sense. FERC openly acknowledges, however, that its current rules fail to take this principle into account, turning a blind eye towards this issue. Instead, its rules focus strictly on short-term marginal costs – i.e., day-ahead or same-day energy pricing and capacity payments based upon expected needs three years out.

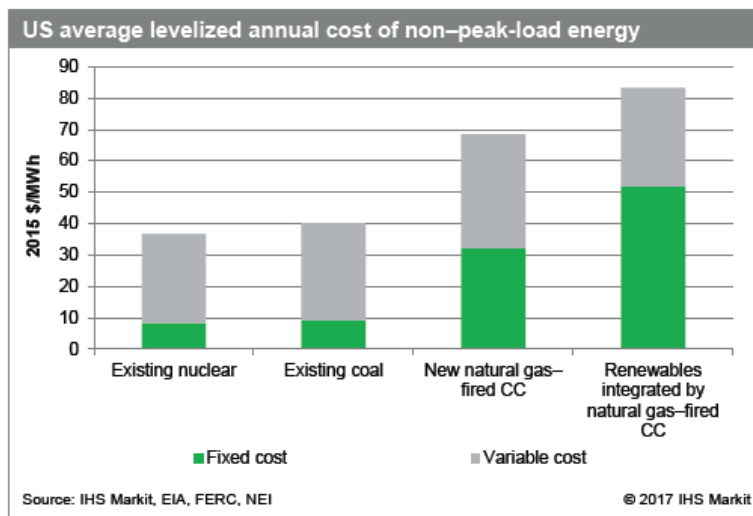
This rigid focus on short-term marginal costs gives generation owners an incentive to focus only on maximizing short-term operating margins, *not* on maximizing operating efficiency over the seven to twelve year planning horizon required for investments in new baseload generation. The IHS Study highlights the critical importance of this issue. IHS estimates that over the past three years, maintaining a diverse generating mix has saved electricity users an average of \$98 billion/year – i.e., extrapolated out over a twenty (20) year period, potentially as much as \$2 trillion.

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<sup>8</sup> HIS Study at 5, 39.

The recent September 2017 IHS Study shows that a diverse portfolio of generation resources that include baseload coal and nuclear units is necessary to ensure that electricity prices remain at reasonable levels on a long term basis. As articulated in the IHS Study, a cost effective electrical power supply portfolio integrates available generation technologies – intermittent renewables, gas turbine, gas combined cycle, and baseload nuclear and coal – to meet consumer demand at the lowest overall cost. Because fifty percent (50%) of consumer demand is constant, day or night, winter or summer, baseload nuclear and coal plants are the most cost-effective resources to serve this portion of the electrical load.

The figure below from the IHS Study compares the going forward costs for existing coal and nuclear power baseload generation to the cost of replacement of this generation with (1) natural gas-fired combined cycle generation and (2) a mix of intermittent wind and solar resources integrated with natural gas-fired combined cycle generation.<sup>9</sup>



This comparison shows that replacing existing coal and nuclear generation with natural gas and intermittent renewable generation would cost approximately double the cost of the existing coal and nuclear generation. The IHS Study notes that, as a result, the continued

<sup>9</sup> IHS Study at 36.

retirement of baseload coal and nuclear units could result in significantly eroding consumer net benefits, stating as follows:

The current accelerated turnover of generating resources in the US power supply portfolio is eroding the net benefit to US consumers from electricity consumption. The potential exists for current trends to lead to a less diverse supply portfolio made up of no nuclear, coal, or oil generating resources and 20% less hydro capacity, with the rest of generation made up of wind and solar resources integrated with natural gas-fired generating technologies in proportions reflecting the current mix of these technologies and fuel sources in the new power supply pipeline.<sup>10</sup>

IHS calculates that this would result in an increase of retail power prices by about 25 percent and net consumer costs by about \$98 billion per year.<sup>11</sup> Therefore, failure to maintain the resource diversity by prematurely retiring nuclear (and coal) baseload units could, extrapolating over the next 20 years, increase electricity costs by as much as \$2 trillion. These effects are magnified further as soaring electricity costs ripple through the broader economy, with large adverse impacts over the three (3) year period on U.S. GDP (a loss of 0.8%), on real disposable income (a drop of about \$845 per household in 2016 dollars), and jobs (a loss of 1 million).<sup>12</sup>

As coal capacity is retired at alarming rates, however, the crucial market balancing will cease to be effective. Many coal units scheduled for closure were called upon to meet the exigent circumstances created by the Polar Vortex. If gas-to-coal switching can no longer moderate demand effectively, prices will have to go high enough to shut-in LNG exports – putting U.S. residential, commercial, and industrial end users at the whim of international markets. End users may be subjected to prices of \$10.00/MMBtu or higher for an extended period of time – more than 3-4 times recent levels. With falling diversification in the electricity

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<sup>10</sup> IHS Study at 36.

<sup>11</sup> IHS Study at 5, 37-38.

<sup>12</sup> IHS Study at 5, 39.

sector and increasing reliance on natural gas, these increased natural gas costs will flow directly into electricity markets, increasing costs sharply.

Future retirements of coal and nuclear generation will only continue to increase demand for natural gas generation and reduce the ability to switch from gas-to-coal in periods of system stress. Absent immediate action, it is entirely plausible that within the next decade an additional 20-25% of coal and nuclear capacity may be retired. This will lead to additional employment loss and will further increase vulnerability of the grid to natural gas price shocks, while at the same time making these shocks significantly more likely by reducing the ability to switch from gas-to-coal during periods of high system stress. Even if these obstacles could be overcome, there will likely be a significantly increased fuel cost for natural gas generators and, by extension, higher prices for electricity.

FirstEnergy Solutions is entirely correct in contending that neither FERC nor PJM have addressed distorted market pricing conditions. Market rates not recognizing the benefit of resiliency and diversity are putting the Nation at risk for astronomical cost increases in the future. Neither FERC nor PJM have addressed the wave of recent and contemplated plant retirements. There has been no effort to address:

- The impact of continued retirement of baseload units on the ability of grid operators to meet voltage support and frequency control requirements or to provide reactive power;
- As detailed above, the potential cost-effectiveness of continuing to operate these plants, compared to the expected cost of new generation that might soon be needed in the regions in which retirements have been occurring;
- The potential long-term costs and price risks for electricity customers of failing to maintain resource diversity; and
- The ability to cost-effectively meet future state or federal environmental requirements that have a significant possibility of occurring within the next 5 to 10 years, if not sooner.

In sum, neither FERC nor PJM have acted to ensure adequacy of service and protect electricity users against long-term wholesale electricity prices that are higher than necessary in a number of specific respects. By failing to properly account for the value of baseload coal and nuclear generation, FERC and PJM have virtually ignored the role of resource diversity as it relates to potential outages, as well as the agencies' key role in maintaining wholesale power rates at just and reasonable levels and ensuring the safety, reliability and dependability of the Nation's electric supply system.

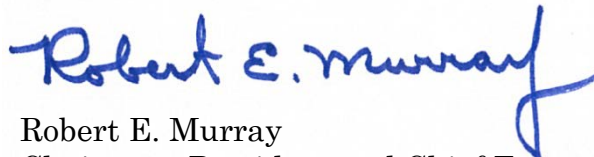
## V. CONCLUSION

FirstEnergy Solutions' March 29, 2018 Request For Emergency Relief Under Section 202 is well-supported, justified and should be immediately granted.

On behalf of Murray Energy, and its ownership, management, and employees, we respectfully submit these comments.

Sincerely,

MURRAY ENERGY CORPORATION



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