The Cost of Preserving Fuel-Secure Electricity Resources - Part 2

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This is the second in a series of short papers about the debate over the retirement of coal-fired power plants, grid resilience and fuel security. These papers are intended to highlight important points that we think are overlooked or downplayed in the debate. Our first paper explained why it's wrong to assume that the electricity grid is (or will be) resilient just because it's reliable.[i]

This second paper offers a few thoughts on the administration's efforts to prevent the retirement of even more coal-fired and nuclear power plants, which provide fuel security.[ii] (Almost 40 percent of the nation's coal fleet has either retired or announced plans to retire.) The coal fleet maintains a large coal stockpile at each power plant. Last year, the average coal-fired power plant had an on-site coal supply ranging from 71 days to 104 days of coal burn.[iii] Coal stockpiles provide resilience against high impact, low frequency disruptions because on-site fuel supplies minimize the potential for fuel supply disruptions. By contrast, at least 40 percent of the nation's electricity resources are *not* fuel secure.[iv]

The administration's efforts to prevent more retirements have not been popular. Critics panned DOE's grid reliability study released in August 2017[v]; then they opposed the grid resilience rule that DOE proposed for FERC ("FERC NOPR") in September[vi]; and now they're objecting to a recent paper drafted for the National Security Council ("leaked NSC memo").[vii]

Often, critics point to cost. Someone will have to pay to keep an as-yet-unknown number of coal and nuclear power plants running in order to promote national security and ensure the electric grid is resilient. The cost could be borne by either ratepayers or taxpayers, depending on what the administration decides to do. Regardless who pays, it sounds like any cost is too high for these critics. However, would the cost really be out of line? We thought answering a few questions would add some perspective.

What would it cost to prevent at-risk power plants from retiring? Recent reporting mentions estimates that range from $311 million to as much as $34 billion per year.[viii] PJM's Independent

Market Monitor estimated the cost of the DOE NOPR at $1.7 billion to $29 billion per year in the 13-state PJM footprint.[ix] ICF estimated that providing compensation to 84,000 MW of coal-fired and nuclear generation could cost $1 billion to $4 billion annually.[x] Because no one knows, $4 billion per year doesn't seem like an unreasonable guess for the cost of preventing the retirement of at-risk coal and nuclear plants. However, keep in mind unintended consequences that also could lower the overall cost. For example, fewer coal and nuclear retirements could reduce demand for natural gas, which could lower natural gas prices.

How does the cost of preventing power plant retirements compare with other spending to protect national security? Department of Defense installations are more than 90% dependent on the electric power grid.[xi] The leaked NSC memo makes a persuasive case for avoiding more coal and nuclear retirements that could weaken national security. "[R]esources that have a secure on-site fuel supply, including … coal-fired power plants, are essential to support the Nation's defense facilities, critical energy infrastructure, and other critical infrastructure."[xii] Asked recently how DOE would justify the cost of keeping at-risk coal and nuclear plants operating, DOE Assistant Secretary Bruce Walker replied, "… the question I would pose is what's the value of national security ... which I think is priceless. Our freedom and our democracy are priceless."[xiii]

While $4 billion per year is not trivial, it is tiny compared to other investments for national security. One way to put $4 billion into perspective is to compare it to defense spending, whose purpose is to promote national security. (There are other expenditures that promote national security, such as for the Department of Homeland Security.) Defense spending over the past three fiscal years has averaged about $645 billion per year.[xiv] Paying an additional $4 billion per year to promote national security would represent less than 0.6 percent of federal funding for the same purpose.

How does the cost of preventing retirements compare to the overall cost of electricity? Consumers paid roughly $400 billion for electricity last year.[xv] Using our best-guess cost of $4 billion per year, consumers would be paying 1 percent more for electricity in order to promote national security and to make the grid more resilient. Considering the benefits, that cost doesn't sound unreasonable.

How does the cost to prevent retirements compare to other subsidies? Our best-guess cost of $4 billion per year is considerably smaller than federal tax subsidies that have supported renewable energy sources for four decades. For example, wind and solar will have received tax subsidies

averaging $7.3 billion per year over the period 2016-2020, according to the Joint Committee on Taxation.[xvi] Wind and solar do *not* provide fuel security.

What's the cost if the grid is not resilient? There is no direct answer to this question, but there are estimates for the cost of electricity outages. All are in the billions of dollars. According to the National Academy of Sciences, "… a large-scale blackout could result in billions of dollars in economic impact, and risk injury or death."[xvii] Examples include Lawrence Berkeley National Laboratory's estimates that power outages and blackouts cost some $79 billion per year.[xviii] In addition, President Obama's administration cited annual costs of power outages ranging from $59 billion to $209 billion.[xix] An investment of $4 billion to reduce the possibility of severe, prolonged power outages sounds like a good investment to us.

What's our point? First, no one knows right now how much it would cost to avoid more coal and nuclear retirements. We'll have to wait and see what the Administration decides to do. Second, any cost needs to be put into perspective. And, finally, we need to keep in mind what we're getting in return for that cost. National security sounds priceless to us too.

[i] The first paper is available at www.americaspower.org.

[ii] PJM defines fuel security as "the ability of the system's supply portfolio, given its fuel supply dependencies, to continue serving electricity demand through credible disturbance events, such as coordinated physical or cyber-attacks or extreme weather that could lead to disruptions in fuel delivery systems, which would impact the availability of generation over extended periods of time. To define potential fuel-security criteria, PJM needs to understand the fuel-supply risks in an environment trending towards greater reliance on natural gas supply and delivery."

[iii] EIA, *Electricity Monthly Update*, "Electric Power Sector Coal Stocks: March 2018," release date May 28, 2018.

[iv] NERC indicates that only 27% of natural-gas-fired generating capacity built over the past two decades has dual-fuel capability. (Source: NERC "Special Reliability Assessment: Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural Gas System," November 2017.) This means that roughly 275,000 MW of gas-fired generating capacity lack dual-fuel capability. In addition, renewable generating capacity totaled some 204,000 MW last year. Thus, approximately 409,000 MW of electric generating capacity lack fuel security. U.S. electric generating capacity last year totaled slightly more than 1 million MW. (Source: EIA AEO 2018)

[v] U.S. Department of Energy, *Staff Report to the Secretary on Electricity Markets and Reliability* (August 2017).

[vi] U.S. Department of Energy, *Grid Resiliency Pricing Rule*, Docket No. RM18-1 (September 28, 2017).

[vii] The 40-page leaked paper was referred to in trade press articles as a "memo," so we refer to it as the "leaked NSC memo." However, it's actually styled as an addendum to some other document. The leaked paper is dated 5/29/18.

[viii] SNL, "Economics is secondary: DOE coal, nuclear plan likely hits utility or tax bill," Taylor Kuykendall, June 26, 2018.

[ix] http://monitoringanalytics.com/Filings/2017/IMM_Comments_Docket_No_RM18-1_20171023.pdf

[x] ICF, "DOE NOPR - Grid Resiliency Pricing Rule," PowerPoint presentation, October 4, 2017.

[xi] Leaked NSC memo.

[xii] *Ibid.*

[xiii] Interview with Bruce Walker about "Bolstering U.S. Grid Resilience," Columbia Energy Exchange podcast, June 18, 2018.

[xiv] CSIS, *Analysis of the FY 2018 Defense Budget*, December 2017.

[xv] According to AEO 2018, electricity sales totaled 3,845 billion kWh in 2017. The average retail price of electricity the same year was 10.6 cents per kWh.

[xvi] Staff of the Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 2016-2020*, Prepared for the House Committee on Ways and Means and the Senate Committee on Finance, January 30, 2017.

[xvii] Lawrence Berkeley Laboratory, *Cost of Power Interruptions to Electricity Consumers in the United States,* February 2006.

[xviii] National Academy of Sciences, *Enhancing the Resilience of the Nation's Electricity System*, 2017.

[xix] Executive Office of the President, *Economic Benefits of Increasing Electric Grid Resilience to Weather Outages*, August 2013.