



July 13, 2021

President Joseph R. Biden
The White House
1600 Pennsylvania Avenue, N.W.
Washington, DC 20500

President Biden,

The events of 2021 continue to heighten my concern that the reliability of the U.S. power grid may be compromised if policy-makers do not navigate the evolution in the generation portfolio carefully, especially as policies carry us farther from conventional generation technologies.

The May cyberattack leading to the temporary shutdown of the Colonial pipeline points to the critical importance of fuel security for electric utilities. Although the Colonial pipeline crisis primarily affected vehicle fuel, the implications are clear for other fuels dependent on pipeline delivery. On May 13, North American Electric Reliability Corp.'s President and CEO Jim Robb noted his concerns related to the electricity industry:

"The Colonial pipeline attack underscores the interconnectedness of electricity with other infrastructures and is the reason we must redouble our focus on the reliability of the pipeline system that delivers essential fuel. If this had happened to a major natural gas line serving electricity generators under extreme cold weather conditions, the results could have been catastrophic."¹

This follows the February winter storms, which exposed weather-related deficiencies in the fuel-delivery system for natural gas-fueled power plants in Texas and surrounding states, leaving millions without electric service for extended periods during the bitterly cold weather.

As I have emphasized in my previous letters, my primary concern is maintaining reliable, affordable electric service for the people and businesses of Kentucky, especially during extreme weather events such as this year's winter storms. Like Mr. Robb, I am very concerned when I consider the potential consequences if a fortune-seeking hacker or, worse, an adversarial nation-state finds a way to disrupt fuel deliveries to power plants in the midst of an ongoing extreme weather event.

¹ NERC, "Electric-Gas Interdependencies, Potential Summer Energy Shortfalls are Focus of Board Discussions," May 13, 2021. <https://www.nerc.com/news/Headlines%20DL/Board%2013MAY21.pdf>.

It is worth taking a moment to consider how various electric-generating technologies are fueled, and how and when those fuels are delivered to generators.

Nuclear and coal are two technologies that, for decades, have produced dependable supplies of electricity for the U.S. Fuel can be delivered months or years ahead of time and stored securely on site for nuclear- and coal-fueled generators. The refueling process for a nuclear unit is complex; but, once complete, the plant can operate for long periods before refueling is required. Coal plants typically store 30 to 60 days of fuel on site. Coal can be delivered by truck, train or barge. Such transportation flexibility provides valuable options for emergencies, such as when a railroad track is damaged or river travel is disrupted.

Wind and solar generators rely on real-time wind and solar irradiance conditions to produce electricity. If the wind does not turn a turbine or the sun does not shine on a solar panel, no energy is generated. When these technologies generate more electricity than needed in the moment, the energy can be stored for later. But I strongly urge you and your policy advisors to have a realistic understanding of the limitations of current utility-scale battery technology. For the most part, batteries may be able to provide a few hours of energy for limited geographic areas. The future of utility-scale battery technology is promising, but it is a grave mistake to assume it, paired with renewables, can provide anywhere near the 24/7/365 reliability Americans are accustomed to. Furthermore, deployment of batteries has not begun to reach a level that could make an appreciable difference over a widespread area. EKPC operates within PJM, which estimates a summer peak of 149,000 MW for 2021²; the installed capacity of utility-scale batteries within the RTO as of May 2020 was 280 MW³.

For natural gas, the fuel delivery mode is almost universally by pipe. Most natural gas power plants are served by a single pipeline; any interruption to the pipe or somewhere upstream can mean almost instantaneous power plant outages. Some natural gas plants, including EKPC's, have on-site storage of alternative fuel, such as oil, which can usually keep the plant running for another day or so. Beyond that timeframe, continuing to run the plant at full capacity without pipeline access can mean a tremendous undertaking of quickly sourcing and delivering dozens or even hundreds of truckloads of oil daily.

For many, the Colonial pipeline crisis revealed a vital fact—a large swath of the U.S. is heavily dependent on a single pipeline for its vehicle fuel. Likewise, Americans should understand they are increasingly dependent on natural gas pipelines for reliable electric service, but pipeline capacity is not growing nearly as fast as the capacity of the power plants they support. In the past decade, major interstate pipeline capacity for natural gas has expanded just 24 percent⁴ while natural gas's share of U.S. electric

² PJM Interconnection, "PJM Summer Outlook Forecasts Adequate Supplies To Serve Electric Demand," 5/20/21 press release, <https://www.pjm.com/-/media/about-pjm/newsroom/2021-releases/20210520-pjm-summer-outlook-forecasts-adequate-supplies-to-serve-electric-demand-this-summer.ashx>.

³ PJM Interconnection, "Energy Storage Offers Efficiency, Flexibility to Power the Grid," May 18, 2020, <https://www.pjm.com/-/media/about-pjm/newsroom/fact-sheets/energy-storage-fact-sheet.ashx>.

⁴ U.S. Energy Information Administration (U.S. EIA), Major Pipeline Crossing Multiple State Borders (Capacity in MMcf/d), 2007-2020, <https://www.eia.gov/naturalgas/pipelines/EIA-StatetoStateCapacity.xlsx> downloaded 5/28/21.

generation ballooned from 15 percent to 35 percent.⁵ In fact, since 2005, natural gas deliveries to power plants have doubled.⁶

And it is important to note that for many regions, natural gas is the primary—sometimes only—fuel to fill in gaps when renewables are not available. Plants fueled by other reliable technologies that could help fill the gap are steadily declining. While natural gas power plant capacity expanded during the past decade, 95 gigawatts (GW) of coal capacity was closed or switched to another fuel, and another 25 GW is slated to shut down by 2025.⁷ U.S. electric utilities also retired nearly 9,000 MW of nuclear capacity in the past 10 years. In the next five years, the federal government forecasts no new coal plants will be built.⁸ Two new nuclear units totaling 2,200 MW have been under construction for more than a decade at the Vogtle plant in Georgia, our nation's first new nuclear units in nearly 30 years. The project's numerous delays and over \$13 billion in cost overruns are likely to deter proposals for new nuclear for the foreseeable future.

The emerging picture is of an electric grid that is steadily becoming less fuel secure, and that is troubling to me. I am concerned the U.S. is moving toward a grid featuring reliability similar to California's, one that is over-reliant on intermittent energy resources, voluntary service curtailments and imports from other regions. And, when those tools fail to close the gap, it is a grid that is subject to rolling blackouts, as California learned last summer.

NERC's 2021 Summer Reliability Assessment noted that most of the U.S. west of the Rockies, along with Texas, the upper Midwest and New England, are at "elevated risk to energy emergencies." And California was singled out as being at risk during normal peak summer hours and at "high risk" if demand is above normal.⁹ As California ISO (CAISO) released its own projections for how it hopes to meet demand for electricity this summer, CAISO CEO Elliott Mainzer commented:

"New resources are coming online by summer, and we have taken the lessons learned from last year to make modifications to our market and operations. This makes us cautiously optimistic that there will be enough electricity to meet demand this summer."¹⁰

Given California's experience last summer, I am doubtful "cautious optimism" provides much reassurance to those who depend on reliable electric service, including residential customers cooling their homes and industrial customers keeping their operations running and employees working.

⁵ U.S. EIA, Electric Power Annual 2019, Table 3.2.A Net Generation by Energy Source, 2009-2019. Downloaded from <https://www.eia.gov/electricity/annual/>, 5/21/21

⁶ U.S. EIA, U.S. Natural Gas Consumption by End Use, http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm, downloaded 5/22/21.

⁷ U.S. EIA, "As U.S. coal-fired capacity and utilization decline, operators consider seasonal operation," Sept. 1, 2020. <https://www.eia.gov/todayinenergy/detail.php?id=44976>

⁸ U.S. EIA, Preliminary Monthly Electric Generator Inventory (based on Form EIA-860M as a supplement to Form EIA-860), downloaded from <https://www.eia.gov/electricity/data/eia860m/> on 5/22/21

⁹ North American Electric Reliability Corp., "2021 Summer Reliability Assessment," May 2021.

¹⁰ California ISO, "California ISO Summer Assessment reaffirms that grid is better positioned for this summer, but reliability risks remain," downloaded from <http://www.caiso.com/about/Pages/News/default.aspx>, 5/22/21.

As the Biden administration considers and implements policies that bring permanent change to America's energy landscape, fuel security should be given the priority it deserves in protecting the grid's reliability.

Sincerely,

A handwritten signature in black ink that reads "Anthony Campbell". The signature is written in a cursive, flowing style.

Anthony "Tony" Campbell

President & CEO

CC: U.S. Energy Cabinet Secretary Jennifer Granholm
FERC Chairman Richard Glick
Senate Minority Leader Mitch McConnell
Senator Rand Paul
Senator Joseph Manchin
Congressman Andy Barr
Congressman Hal Rogers
Congressman Brett Guthrie
Congressman Thomas Massie
Congressman James Comer
Congressman John Yarmuth
Governor Andy Beshear
Kentucky Senate President Robert Stivers
Kentucky Energy and Environment Secretary Rebecca Goodman
Kentucky PSC Chairman Michael Schmitt
Kentucky PSC Vice-chairman Kent Chandler
Kentucky PSC Commissioner Talina Mathews