

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

ELECTRONIC APPLICATION OF LOUISVILLE GAS)
AND ELECTRIC COMPANY AND KENTUCKY) Case No.
UTILITIES COMPANY FOR THE 2021 JOINT) 2021-00393
INTEGRATED RESOURCE PLAN)

ATTORNEY GENERAL’S COMMENTS

The Attorney General of the Commonwealth of Kentucky, through his Office of Rate Intervention (“OAG”), tenders the following comments regarding the 2021 Integrated Resource Plan (“IRP” or “Plan”) of Louisville Gas & Electric-Kentucky Utilities¹ (hereinafter jointly referenced as “LG&E-KU” or “the Companies”) in the above-styled matter.

A. General

Through their combined service territories that span the entire breadth of the Commonwealth,² the Companies provide electric generation, transmission and distribution service to nearly one million customers in 77 counties.³ As the IRP’s Summary section poignantly states:

“Reliable, low-cost electricity is *critically important* to the Commonwealth’s economy. As a leading manufacturer of automobiles, steel, and other products, Kentucky was the 7th most electricity-intensive U.S. state in 2019, as measured by the ratio of electricity consumption and state gross domestic product.”⁴

¹ Individually, “LG&E” or “KU.”

² KU also provides electric service to five counties in Virginia through its affiliated company, Old Dominion Power Company, to approximately 28,000 customers. *See* IRP Table 7-1. LG&E also provides gas service to approximately 330,000 customers in 16 Kentucky counties. IRP Vol. 1 at 5-1.

³ IRP Vol. 1, at 5-1.

⁴ IRP Vol. 1, at 5-1 (emphasis added).

The Companies' combined energy requirements, both actual and weather-normalized, fell during the 2015-2020 period, due primarily to mining sector declines, industrial production efficiency improvements, and efficiency improvements in residential and commercial end-uses.⁵ Furthermore, energy requirements fell even more significantly in 2020 due to the Covid-19 pandemic, but the Companies are forecasting a return to the same slightly downward trend that existed prior to the pandemic's onset.⁶

The Companies' energy requirements will likely increase as a result of anticipated new load from the planned twin Ford Motor Company vehicle battery plants in Hardin County, for which the Companies will provide electric service.⁷ Although the announcement of this significant project came so close to the IRP's filing date that it could not be factored into the IRP analysis,⁸ the Companies nonetheless do not anticipate needing any additional generation capacity prior to 2028.⁹ Additionally, just one week prior to the filing date of the instant comments, yet another vehicle battery manufacturer announced plans¹⁰ to construct a new plant in Bowling Green, Kentucky. Although this particular plant will be served by TVA, nonetheless the announcement creates a major level of economic momentum along the Interstate 65 corridor in Kentucky into which other satellite industries are likely to launch additional plants. It is likely that many of these satellite plants will be located within the Companies' combined service territories. The Attorney General anticipates that many

⁵ IRP Vol. 1, at 5-1.

⁶ IRP Vol. 1 at 5-1, and Fig. 5-2.

⁷ Response to AG-DR-1-1.

⁸ IRP Vol. 1 at 5-44, footnote 47.

⁹ Response to AG-DR-1-1. The Companies have submitted a transmission service request for construction power at the project sites to their Independent Transmission Organization, which approved the request without citing any needs for new transmission network upgrades. Further, the Companies will in the near future submit another transmission service request for permanent power required to operate the plant's full capacity. *Id.*

¹⁰ See, e.g.: <https://www.wcluradio.com/2022/04/13/vehicle-battery-company-announces-expansion-in-bowling-green-creates-2000-new-jobs/> (last accessed April 20, 2022).

manufacturers and parts suppliers associated with the vehicle battery plants will seek to utilize the Companies' Green Tariff (Option # 3) for their operations.¹¹

Currently, KU's peak occurs during the winter, while LG&E's peak occurs during the summer.¹² The instant IRP, however, sets forth a potential scenario toward the end of the IRP planning period in which LG&E could become a winter-peaking utility. This would occur only under a high energy requirements scenario, contributed to by a continuing trend toward increased adoption of electric space heating, as well as a high electric vehicle penetration rate.¹³ Such a change could have significant ramifications for the combined Companies and their customers. The Attorney General encourages the Companies to continue their analysis and reporting on any trends regarding this issue.

B. Supply-Side Resources and Affordability

The Companies' current generation fleet is diverse, consisting primarily of dispatchable coal and gas-fired resources,¹⁴ but also of hydro-power and a growing quantity of solar. Most of the Companies' original coal-fired fleet is retired.¹⁵ Some of the Companies' remaining coal-fired generation units are scheduled to be retired within the next six years,¹⁶ while some of the other coal-fired units are scheduled for retirement later within the instant IRP's planning period. Given the pending retirements of such a significant amount of

¹¹ See e.g., KU Tariff Sheet P.S.C. No. 20, First Revision of Original Sheet No. 69.1 – 69.3.

¹² Response to AG-DR-1-16. Since 2010, the combined Companies' peak occurred in the winter three times. See also the responses to PSC-DR-1-2 and PSC-DR-1-20.

¹³ IRP Vol. 1 at 5-35 – 5-36; Response to AG-DR-2-1.

¹⁴ Of the Companies' total 7,702 MW (summer rating) of generation resources, 7,536 MW originate from dispatchable coal-fired or gas-fired units, and 105 MW originate from solar or hydropower resources. The Company also has 190 MW of demand side resources available (all in summer ratings). IRP Vol. 1 at 5-6, Table 5-1.

¹⁵ E.g., Green River Units 1-4, Tyrone, Pineville, Brown Units 1-2, Can Run Units 1-6, Canal, and Paddy's Run.

¹⁶ Mill Creek Unit 1 in 2024; Mill Creek Unit 2 in 2028; and Brown Unit 3 in 2028. Response to AG-DR-1-12.

dispatchable generation, the Attorney General believes it will be critically important – but challenging – to identify and plan for new, reliable supply-side resources.

The Companies conclude that based on their need for new supply side resources projected to begin in 2028, they will submit two CPCNs for this new generation. The first CPCN filing could come as soon as this year, together with a new load forecast.¹⁷ Based on the Companies' current analysis (which is likely to change somewhat in the actual CPCN filing), they are likely to require two simple-cycle combustion turbines, together with new solar generation in quantities ranging from 300 MW – 1,000 MW, depending on the fuel price scenario.¹⁸ The second CPCN filing is based on needs for the 2034-2036 timeframe, in which the Companies project they will need an additional 1,100 MW - 3,800 MW, again depending on fuel price scenario and another revised load forecast.¹⁹ Furthermore, depending on the levels of renewable generation penetration, and of dispatchable generation in the Companies' fleet, they may also require major amounts of expensive battery storage.

The growing national-level interest in electrifying both space heating and motor vehicles will require significantly more electric generation capacity. The Attorney General is concerned that the massive new costs necessary for this new capacity will make electric utility bills unaffordable for a growing number of ratepayers. Indeed, the Companies note that their IRP analysis takes into consideration that renewable resources alone will be unlikely to meet additional load associated with electrification of space heating and EV charging, as their

¹⁷ 2021 IRP Vol. III, 2021 IRP Long-Term Resource Planning Analysis, “Table 17: New Generation in Least-Cost Resource Plans, Base Load Scenario”; and Response to AG-DR-2-17.

¹⁸ 2021 IRP Vol. III, 2021 IRP Long-Term Resource Planning Analysis, “Table 17: New Generation in Least-Cost Resource Plans, Base Load Scenario”; Response to AG-DR-2-17; and IRP Vol. 1, Table 8-3.

¹⁹ 2021 IRP Vol. III, 2021 IRP Long-Term Resource Planning Analysis, “Table 17: New Generation in Least-Cost Resource Plans, Base Load Scenario”; Response to AG-DR-2-17; and IRP Vol. 1, Table 8-3.

expansion plans also incorporate simple-cycle combustion turbines and battery storage.²⁰ Greater penetration of renewable resources will also create a need for utility-scale battery storage, which will increase consumer costs on an *exponential* basis. Kentucky ratepayers, whether residential or industrial, cannot easily absorb the massive new costs that will be added onto their bills. Therefore, the Attorney General encourages the Companies to carefully consider affordability in the mix of options for their future supply side resource needs.

C. Reserve Margin

For the period 2028-2036, the IRP reveals a major increase in the summer reserve margin, from 29.3% to 44.9%, due to increased adoption of renewables.²¹ But under the IRP, this is only the beginning of capital spending needs for new generation, because *additional* forms of capacity will have to be added in order to meet *winter* capacity needs.²² The Attorney General recommends that the Companies' future IRP analyses include studies to determine whether this anticipated differentiation between seasonal capacity needs could be mitigated, or perhaps even eliminated if the Companies utilized more dispatchable resources, which is not limited by seasonal considerations. The Companies' cost-benefit analyses should also consider whether a lower reserve margin of dispatchable supply side resources, available year-round, could provide the least cost solution, in contrast to having to maintain higher capacity levels of renewable resources, the availability of which is more prone to seasonal constraints.

D. Grid-Forming Technology

²⁰ Response to AG-DR-1-15.

²¹ Response to AG-DR-1-35; *See also* Responses to PSC 2-5, and Louisville/Jefferson County Metro Government DR-1-10.

²² *Id.*

One of the benefits of using turbine-driven, synchronous generation is the production of natural inertia that forces the flow of electrons down the wires. This natural inertia retards the decay of frequency, keeping it at or near 60 Hz, and produces short circuit strength which provides ride-through capability for intermittent or sustained oscillations.²³ Greater usage of renewable, non-thermal generation results in less natural inertia and a greater need for synchronous assets or grid-forming technologies (such as grid-forming inverters) to maintain system voltage and frequency support in order to keep the grid stable, reliable and safe.²⁴ As the Companies pointed out in response to discovery:

“Ultimately, until generation is retired and studies of powering the grid with renewables are refined with the ever-changing inverter technologies, it is unknown what the cost implications might be. Grid-forming inverters, at the utility scale, are more costly than grid-following inverters since their controls must be very robust. Synchronous condensers and flywheels should also be considered in the package of solutions identified as we reliably incorporate clean energy.”²⁵

Given that the Companies project greater use of renewable generation, coupled with additional retirements of existing synchronous generation, the Attorney General encourages the Companies to conduct detailed studies into cost projections for grid forming technologies, and to include such costs in its next IRP. This will provide a more transparent means of informing the Commission and the public regarding the true costs of converting to renewable resources. Furthermore, the Attorney General encourages the Commission to require all electrical utilities in the Commonwealth to do likewise in their next IRPs.

E. Reliability

²³ Response to AG-DR-2-8, p. 1 of 2.

²⁴ *Id.*, p. 1 of 2.

²⁵ *Id.*, p. 2 of 2.

The Attorney General believes that a well-balanced mix of both dispatchable and renewable generation resources ensures competitive, reliable, and resilient energy that will be essential for Kentucky's economy. However, it is only through an "all-of-the-above" energy policy that this can be achieved.

The Attorney General has several concerns regarding any large-scale, rapid adoption of renewable resources in the Commonwealth, such as is exhibited in the instant IRP. First, Kentucky's climate does not provide adequate wind and solar capacity to make large-scale, rapid adoptions of renewable resources cost-effective for utility ratepayers. Renewables are only economical when the sun is shining and the wind is blowing.

Second, this inherently intermittent nature of renewable supply-side resources carries reliability risks; indeed, the nation is already experiencing major reliability problems in those regions where such a major switch to renewable sources has occurred, and which lack adequate dispatchable resources such as baseload generation to complement renewable resources.²⁶ The Northwest and Southwest face growing risks as renewables continue to replace flexible coal and natural gas plants that can be dispatched when the sun goes down and wind turbines do not spin.²⁷ Meaningful, cost-effective battery capacity for wind and solar generation does not exist today.²⁸

²⁶ See, e.g., "Ensuring Electricity Reliability Must Be Job Number One For FERC," July 29, 2021: <https://www.utilitydive.com/news/ensuring-electricity-reliability-must-be-job-number-one-for-ferc/604034/> (last accessed April 20, 2022); and "Renewable Energy Boom Risks More Blackouts Without Adequate Investment In Grid Reliability," <https://www.forbes.com/sites/michaelshellenberger/2021/04/20/why-renewables-cause-blackouts-and-increase-vulnerability-to-extreme-weather/?sh=3ef335174e75> (last accessed April 20, 2022).

²⁷ "Natural gas a critical 'reliability fuel' as renewables grow, NERC says," S&P Global Market Intelligence, December 17, 2021: <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/natural-gas-a-critical-reliability-fuel-as-renewables-grow-nerc-says-68130328> (last accessed April 20, 2022).

²⁸ "Wind and Solar Energy Don't Work," Powerline, February 10, 2021: <https://www.powerlineblog.com/archives/2021/02/wind-and-solar-energy-dont-work.php>. (last accessed April 20, 2022).

Third, even though some states contiguous to the Commonwealth do have areas with greater renewable energy capacity factors, the Commission's IRP regulations do not require Kentucky's electric generating utilities to factor-in costs of additional transmission capacity frequently required to wheel out-of-state power into the utilities' respective service territories. The Commission should require all such relevant data in order to develop sound planning.

Fourth, the renewable energy transition will increase utility bills. Recently, the Wisconsin PSC approved a settlement which Xcel Energy and Alliant Energy reached with consumer advocacy, environmental and business groups that raised electric and natural gas rates for next year. Commissioner Ellen Nowak voted against the settlements saying, "[w]e should be going toward renewables, but the race to get there – it's going to have consequences that can be done in a more economical way that has fewer impacts on the ratepayers." Chair Rebecca Valcq noted, "I'm concerned that the agreement doesn't go far enough to protect customers, especially from bearing the brunt of the cost from retired coal plants."²⁹ Additionally, in New York ConEd is proposing double digit rate increases to fund clean energy investments necessary to meet New York state's climate goals.³⁰ The increased burden on ratepayers of shifting to renewables is being felt globally as well. Bjorn Lomborg, President of the Copenhagen Consensus noted that "The European Union, which gets 17% of its electricity from solar and wind – the highest percentage in the world – also has some of the

²⁹ "Higher utility bills in store for Xcel and Alliant customers as utilities make clean energy transition," Wisconsin Public Radio, November 22, 2021: <https://www.wpr.org/higher-utility-bills-store-xcel-and-alliant-customers-utilities-make-clean-energy-transition> (last accessed April 20, 2022).

³⁰ "Customers, advocacy groups and elected official oppose ConEd's proposed double-digit rate increase" *Utility Dive* April 5, 2022, accessible at: https://www.utilitydive.com/news/customers-advocacy-groups-officials-oppose-coned-rate-hike/621559/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202022-04-05%20Utility%20Dive%20Newsletter%20%5Bissue:40858%5D&utm_term=Utility%20Dive (last accessed April 20, 2022).

highest consumer electricity costs.”³¹ However, the European Union may be shifting its philosophy somewhat as it is now “set to include nuclear and natural gas on the list of industries eligible for ‘green’ investment.”³²

Fifth, renewables cannot support baseload generation and lack the ability to meet increased demand. As a recent PJM report notes, “[t]he proliferation of intermittent resources will also increase the need for controllable resources such as gas-fired combustion turbines and combined-cycle plants that can ramp and/or start up quickly.”³³ Electrification of homes and cars will indeed increase demand. Weather events, heat waves, and winter storms bring certain increases to demand. Potential challenges of the electric grid to meet these increased demands should alarm both Washington D.C. and state capitols, as Robert Bryce of the Foundation for Research on Equal Opportunity stated in his *Wall Street Journal* opinion piece: “Regulators and policy-makers should be preserving nuclear plants and making sure coal plant closures do not further damage grid resilience.”³⁴

Sixth, renewables present significant transmission and grid issues. As East Kentucky Power Cooperative CEO Anthony “Tony” Campbell noted in his letter to President Biden concerning grid reliability, “The emerging picture is of an electric grid that is steadily becoming less fuel secure . . .”³⁵ Vistra CEO Curt Morgan noted that, “PJM did a study that

³¹ “Want to Lock Down the Climate?” Bjorn Lomborg, President of the Copenhagen Consensus, *Wall Street Journal* Opinion, September 30, 2021, accessible at: <https://www.wsj.com/articles/covid-lockdown-climate-fossil-fuels-electricity-energy-production-africa-carbon-emission-11632943155> (last accessed April 20, 2022).

³² “A European Revelation on Climate” *Wall Street Journal* Editorial Board, January 3, 2022, accessible at <https://www.wsj.com/articles/a-european-revelation-on-climate-green-energy-nuclear-natural-gas-france-germany-11641228156> (last accessed April 20, 2022).

³³ “Reliability in PJM: Today and Tomorrow,” PJM Interconnection, March 11, 2021, at 25.

³⁴ “Get Ready for the Blackouts,” Robert Bryce, research fellow at the Foundation for Research on Equal Opportunity, *Wall Street Journal* Opinion, September 7, 2021, accessible at: <https://www.wsj.com/articles/blackouts-generac-electric-grid-texas-california-biden-decarbonize-renewables-climate-11631043410> (last accessed April 20, 2022).

³⁵ EKPC President & CEO Anthony “Tony” Campbell Letter to President Biden, July 13, 2021. Copy attached as Exhibit 1.

said that, with 50% penetration of renewables, they need a 70% reserve margin.”³⁶ American Electric Power, in a letter to congressional offices, stated that the Clean Electricity Performance Program would, “adversely impact reliability and resilience of the electric grid.”³⁷ In fact, PJM cautions that in a scenario of accelerated renewables adoption, “. . . the total hours of transmission line congestion increased by about 50%, and a significant amount of renewable curtailment was needed to manage transmission limitations and minimum generation events.”³⁸

Kentucky does not want – or need – a grid like California’s, “that is over-reliant on intermittent energy resources, voluntary service curtailments and imports from other regions.”³⁹ Agencies whose decisions impact generation selection, including FERC, should manage grid transformation in a way that supports reliability and resilience by identifying and committing to flexible generation as renewable deployment grows.⁴⁰ Finally, unlike some states, Kentucky has not adopted a renewable energy policy. In fact, Kentucky’s current statutes support the burning of coal. *See* KRS 278.020(1)(c).

The Commission and the Companies should pursue the steps necessary to ensure **affordability** and **reliability** are not compromised in the race to renewables. This includes

³⁶ “IPPs See Danger in Swift Move from Gas and Coal,” RTO Insider, December 15, 2021, accessible at: <https://www.rtoinsider.com/articles/29241-ipp-see-danger-swift-move-from-gas-coal> (last accessed April 20, 2022). *See also* “Energy Transition in PJM: Frameworks for Analysis,” PJM Interconnection, Dec. 15, 2021, at 8.

³⁷ “Major utility questions Biden’s signature climate plan,” E&E News, September 15, 2021, accessible at: <https://www.eenews.net/articles/major-utility-questions-bidens-signature-climate-plan/> (last accessed April 20, 2022).

³⁸ “Energy Transition in PJM: Frameworks for Analysis,” PJM Interconnection, December 15, 2021, at 12.

³⁹ EKPC President & CEO Anthony “Tony” Campbell Letter to President Biden, July 13, 2021. Copy attached as Exhibit 1.

⁴⁰ “Natural gas a critical ‘reliability fuel’ as renewables grow, NERC says,” S&P Global Market Intelligence, December 17, 2021, accessible at: <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/natural-gas-a-critical-reliability-fuel-as-renewables-grow-nerc-says-68130328> (last accessed April 20, 2022).

operating fossil fuel plants for as long as economically feasible, and thus minimizing any stranded costs arising from retirement of plants prior to the end of their useful operating lives.

Respectfully submitted,

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Certificate of Service

Pursuant to the Commission's Orders in Case No. 2020-00085, and in accord with all other applicable law, Counsel certifies that an electronic copy of the forgoing was served and filed by e-mail to the parties of record.

This 22nd day of April, 2022



Assistant Attorney General



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.aiso.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