



February 27, 2023

Re: Joint Public Hearing on Grid Reliability and Winter Storm Elliot in Front of the Senate Consumer Protection & Professional Licensure, Senate Environmental Resources & Energy

Dear Chairs Stefano, Boscola, Yaw, and Comitta, and Committee Members:

On behalf of Sol Systems and our 2,500 customers across Pennsylvania, we respectfully submit this testimony highlighting the value of solar to Pennsylvania and offering insight into the events of Winter Storm Elliott. Specifically, Sol Systems thanks the committees for taking this step today to better understand and identify strategies that would allow Pennsylvania to remain a national energy leader and long-term net energy exporter while maintaining an increasingly diverse and reliable electric generation mix for the benefit of all Commonwealth residents and businesses.

Sol Systems is a leading national solar energy firm with an established reputation for integrity and reliability across its development, infrastructure, and environmental commodity businesses. Sol is operating and building over 1.5 gigawatts (GW) of solar projects valued at more than \$1.2 billion for Fortune 100 companies, municipalities, counties, utilities, universities, and schools and provides environmental commodity portfolio management services to more than 20,000 customers across the U.S. Sol Systems has customers in 59 counties across Pennsylvania and was an early pioneer of Pennsylvania's renewable energy by providing homeowners and small businesses the ability to monetize solar renewable energy credits (SRECs). Sol Systems is based in Washington, D.C., with employees in suburban Philadelphia and the greater Harrisburg area.

Value of Solar

Solar is both a critical piece of the electricity generation mix and a key driver of good, local jobs. By the end of 2021, the value of Pennsylvania's solar market reached \$2.8 billion and over 4,100 jobs.ⁱ Solar provides a relatively weather-agnostic domestic energy source that provides local employment opportunity together with critical revenue streams for local communities and landowners.

In 2021 alone, \$33 billion was invested in solar in the U.S. Most projections expect this to reach \$600 billion by the end of the decade, which creates a massive near-term opportunity for Pennsylvania.ⁱⁱ

Importantly, solar is a key prong of a reliable grid. Too often, the “intermittent” nature of renewables, such as wind and solar, is incorrectly interpreted as “unreliable”. This is simply untrue – solar works anytime the sun is up, rain or shine, and longer when paired with increasingly accessible storage options. Just this last summer, solar was key to protecting the energy grid in Texas during extreme heat waves that are becoming increasingly common.ⁱⁱⁱ

Winter Storm Elliott

What Happened?

During Christmas 2022, a storm system named Winter Storm Elliott brought cold temperatures and strong winds across two-thirds of the continental U.S. and over 1.5 million homes and business lost power.^{iv} As PJM notes, the drop of 29 degrees Fahrenheit in our region over 12 hours on December 23, 2022, surpassed the previous PJM record of a 22-degree drop during the 2014 Polar Vortex.^v The federal Department of Energy (DOE) declared a rare emergency order under Section 202(c) of the Federal Power Act, determining that an electric reliability emergency existed within the PJM region.¹ While much of those outages were from distribution system events (e.g., trees on power lines), some outages in North Carolina, Tennessee, and Texas were intentional rolling blackouts due to insufficient generation. (PJM did not have to shed load.)

As PJM has shown in initial analysis, the vast majority of unplanned outages – those that cause brown- and blackouts – were caused by the unreliability of natural gas and coal generation sources: forced outages were 71 percent gas and 16 percent coal (collectively over 87 percent). In contrast, PJM notes that “wind and solar resources performed as the near-term forecasts projected, based upon wind speed and solar irradiance throughout the RTO.” In short, solar, wind, nuclear, and demand response is what prevented even worse outcomes in 2022.

The planned versus unplanned outages is a key distinction in reliability planning. The threat to reliability comes from *unplanned* outages – units that say they will be there, customers pay to be there, and then unexpectedly do not show up when called. On Christmas Eve 2022, nearly one-quarter of the generation capacity PJM expected to rely upon did not show up.^{vi} Around forty-four percent—nearly half—of the gas plants in the region wholly or partially failed to meet their commitments.

¹ This order allowed all electric generating units serving the PJM footprint to operate up to their maximum generation output levels, even if doing so exceeded air quality or other permit limitations. Two generating units ran at levels that exceeded environmental permitting limits, both in Pennsylvania – Bethlehem Energy in Bethlehem, Lehigh County, and York Energy 1 in Peach Bottom Township, York County.

Thus, Winter Storm Elliott highlighted the importance of reliability through generation diversity. Our overreliance on one or a few generation types left the PJM grid vulnerable and risked the public's safety.

Customer Impacts

At the same time, we are also over-relying on a source with very volatile pricing. This has had terrible impacts on ratepayers, including in Pennsylvania, where electric rates (which are set by natural gas units in most hours) increased by over 22 percent from November 2021 to 2022.^{vii} Of course, this had an even greater impact on Pennsylvanians who are doubly reliant on natural gas through electricity prices and through direct consumption in their homes.

Winter Storm Elliott is Part of a Clear Pattern

As PJM explains, what happened at Christmas was fossil fuels failed in the cold. And because we over-rely on fossil fuels, especially natural gas, in this region, the grid failed some people when we needed it most. This is largely the same thing that happened recently in ERCOT. Just like in ERCOT, some tried to blame renewable generation, but the data simply do not bear that out. In Pennsylvania, for example, wind and solar make up less than two percent of electricity generation – it simply defies reason that they could have caused what happened at Christmas. PJM-wide, that number is just over four percent.^{viii}

Unplanned outages on December 24, 2022, were 71 percent gas and 16 percent coal (collectively over 87 percent). These are the outages that threaten reliability, when a resource that PJM expected to be there is not. At the same time, these are resources that customers paid to be there and were not. Thus customers are hit twice – what they paid for resources did not show up as well as higher electricity costs for replacement generation – as well as for the costs of outages themselves. Customers are paying extra for gas prices setting extremely high prices and also having paid for capacity that doesn't show up when we need it.²

There are some that that would disingenuously use the outages at the holidays as an argument for greater reliance on natural gas in residential use. This would only increase Pennsylvanians' reliance on an unreliable, and highly expensive, fuel (not to mention emissions impacts in the home). The answer is not to halt or reverse electrification. Instead, the answer is to diversify the electricity supply, so that, either through electricity or directly through home fuel combustion, we

² PJM found that 95 to 96 percent of units that experienced unplanned outages were from resources with capacity commitments. In other words, these units received upfront payments to be available to provide electricity when called on, and did not. PJM, 2023.

are not reliant on a single source of fuel that is both financially and literally volatile. Winter Storm Elliott is not an argument against electrification – gas failed households as well as powerplants, and Pennsylvanians continue to pay the price.

What's Next

This winter's experience, together with several other major weather events, highlights the importance of ensuring that Pennsylvania has as diverse an energy generation mix as possible and is not over-reliant on any one or few technologies. Expanding and diversifying the Commonwealth's electricity generation capacity will not only create expanded economic advantage and jobs opportunities, but it will allow Pennsylvania to maintain its status as a net energy exporter and a leader in global energy security.

It is essential to start now to develop a broad and diverse energy strategy for Pennsylvania. One that values the benefits of all electric generation types to grid reliability, but also considers key aspects like energy security, consumer protection, environmental harm, and regional competition. We have the tools we need now; we just need action from this committee and others to help chart the future path.

Respectfully submitted,

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- ⁱⁱ SEIA, “Impact of the Inflation Reduction Act,” September 2022. Available https://www.seia.org/sites/default/files/2022-09/SEIA-2022-IRA-Impacts-Factsheet_0.pdf. Accessed February 22, 2023.
- ⁱⁱⁱ Texas Monthly, “Solar Power is Bailing Texas Out This Summer,” July 12, 2022. Available <https://www.texasmonthly.com/news-politics/renewable-energy-texas-grid-heat-wave/>. Accessed February 22, 2023.
- ^{iv} Reuters, “Storm Cuts U.S. oil, Gas, Power Output, Sending Prices Higher,” December 23, 2022. Available <https://www.reuters.com/business/energy/storm-cuts-us-oil-gas-power-output-sending-prices-higher-2022-12-23/>. Accessed February 22, 2023.
- ^v PJM, “Winter Storm Elliott Frequently Asked Questions,” February 10, 2023. Available <https://www.pjm.com/-/media/markets-ops/winter-storm-elliott/faq-winter-storm-elliott.ashx>. Accessed February 21, 2023.
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- ^{vii} EIA, “Pennsylvania Electricity Data and Map.” Available <https://www.eia.gov/beta/states/states/pa/data/dashboard/electricity>. Accessed February 22, 2023.
- ^{viii} Bowring, Joe (Monitoring Analytics), 2021 State of the Market Report for PJM, April 5, 2022. Available <https://www.pjm.com/-/media/committees-groups/committees/mc/2022/20220506-som/20220427-2021-state-of-the-market-report-presentation.ashx>. Accessed February 22, 2023.