October 6, 2026

MAREC Action testimony for the Pennsylvania House Energy Committee on the topic of electric reliability

Chair Fiedler, Chair Causer, and the members of the Pennsylvania House Energy Committee:

My name is Evan Vaughan, I serve as Executive Director of MAREC Action (informally, “Mid-Atlantic Renewable Energy Coalition”). Thank you for the opportunity to testify today. My organization is a non-profit coalition representing over 50 utility-scale solar, wind, and battery storage developers, owner-operators, manufacturers and public interest organizations dedicated to promoting the growth and development of renewable energy in Pennsylvania and in nine other jurisdictions across the PJM electric grid.

My testimony today pertains to the recent Synapse study, commissioned by the Pennsylvania Public Utilities Commission (PUC), titled "Assessing Electricity Resource Adequacy in Pennsylvania and PJM" and its implications for electric grid reliability and affordability. MAREC shares the concerns elevated in the PUC report, and by members of this committee, regarding forecasted shortfalls in electricity supply and rising affordability challenges.

Synapse’s findings highlight solar, storage and onshore wind as majority contributors to new generation in the Commonwealth over the remainder of the decade, with more of those clean resources coming online in the 2030s augmented by new natural gas facilities. Given that MAREC’s membership is comprised of the leading developers and owner-operators of these renewable and storage facilities, I hope my testimony will provide useful insights to help the Energy Committee maximize the affordability and speed to power offered by clean energy resources and expand their deployment to better address concerns raised in this report.

To begin, I will underscore some key findings of fact in the Synapse report (bolded) with my analysis afterward.

Significant finding #1: Demand for electricity is rising dramatically, largely driven by data center growth.

The report’s findings track with MAREC’s understanding of the fundamental imbalance of electricity supply and demand in the PJM region. The unprecedented break from a decade of flat electricity demand first showed up in PJM’s 2024 Long-Term Load Forecast[1]. Largely driven by data centers, but also inclusive of electrification and

[1] https://www.pjm.com/-/media/DotCom/library/reports-notices/load-forecast/2024-load-report.pdf

onshoring of manufacturing, this jump in demand has been the single largest factor causing the imbalance in supply and demand along with corresponding high prices and reliability concerns.

Adding to this challenge, the pace of new electric generating facility deployment has not kept up with the retirement of older, inefficient facilities. The four-year freeze in PJM's interconnection queue, which has now been resolved, was a contributing factor in this dynamic. The queue freeze may be gone, but new financing challenges and chronic barriers to deployment—such as project siting, interconnection cost and transmission congestion—remain.

Around the same window of time in late 2023, just before new demand began showing up in forecasts, PJM adjusted the capacity value of generation resources in response to underperformance by generation during Winter Storm Elliott and to reflect a shift from a power grid that sees peak demand in the summer to a system that sees peak demand in the winter. These changes were well intentioned to address reliability (and indeed the Synapse report shows the manageable reliability concerns in a "no data center growth" scenario clustered in January)[2], but they resulted in a further diminishing of the supply available to meet demand.

Significant finding #2: Reliability concerns are largely addressed in the no data center growth scenario, but affordability concerns remain.

Synapse report's findings show that reliability concerns shrink to manageable and business-as-usual under the "no new data centers" scenario—assuming the forecasted megawatts of solar, storage, land-based wind and the Three Mile Island upgrade come online. Specifically, Loss of Load Expectation under that scenario is less than PJM's longstanding yardstick of 1 day of lost load over 10 years.[3] However, affordability concerns remain significant as illustrated in *Figure 1* below. Without new data centers, capacity prices remain dramatically elevated through the early 2030s. The no data centers scenario shows only modest growth in Locational Marginal (energy) Prices, largely in response to increasing natural gas prices. Even so, it is important to stabilize or reduce these energy price impacts because prices are elevated today as a baseline and energy prices make up the largest portion of system costs. As Synapse notes, differences in energy prices tend to have a larger impact on system costs (and therefore customer costs) than capacity price changes.

In MAREC's view, this points to the addition of solar, wind and energy storage as important under all three scenarios and one should not conclude from this report that all data center growth must stop. There are clear connections in PJM, and Pennsylvania, between data center growth and rising rates—but this is not always the case. A 2025

[2] Synapse Energy Economics, Inc. *Assessing Electricity Resource Adequacy in Pennsylvania and PJM.* Pg 24.
[3] Ibid. Pg 23.

study by Lawrence Berkley National Lab (LBNL) and The Brattle Group[4] found load growth (including from data centers) at the state level has tended to depress retail electricity prices in recent years, by spreading fixed costs over greater load. LBNL goes on to specifically highlight PJM being an exception to this trend, and notes that load growth can increase prices in places with a tight supply market—which we are currently experiencing in PJM.

Said another way, *if PJM had enough generation to match demand, rates would likely decrease due to load growth.*

Figure 7. Modeled energy and capacity prices, PJM-wide

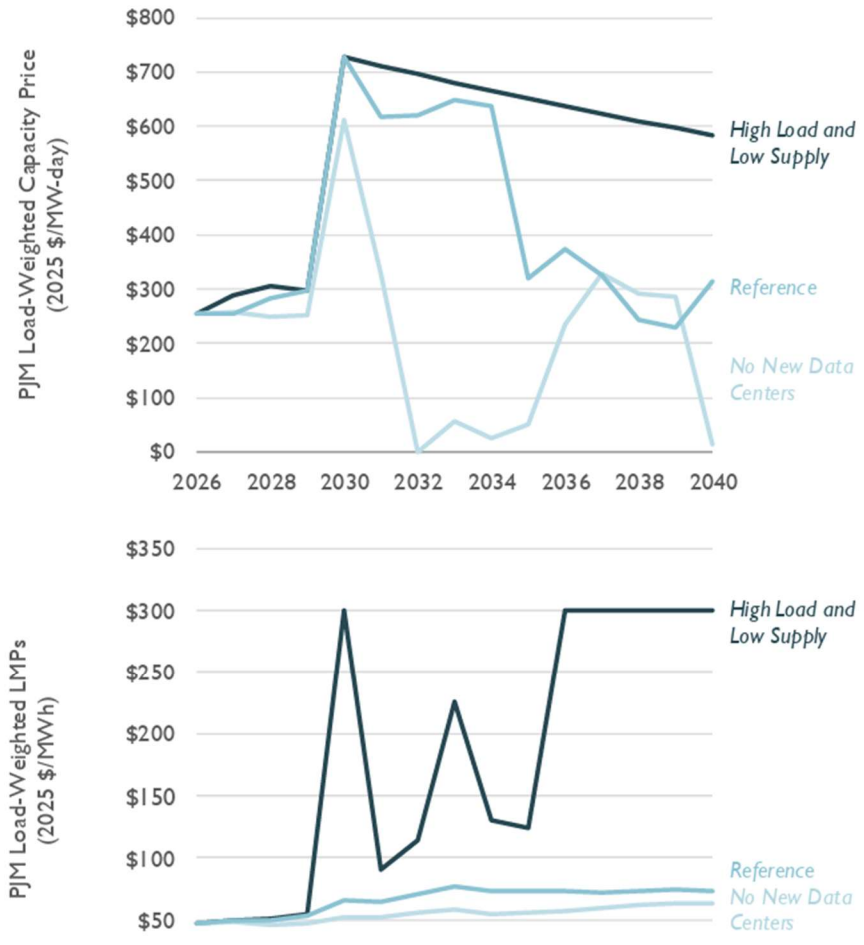

Figure 1: Synapse report estimated capacity and energy costs

[4] Pg 35, 54. https://eta-publications.lbl.gov/sites/default/files/2025-10/full_summary_retail_price_trends_drivers.pdf

We believe actions, like Governor Shapiro's August 18th Executive Order, which pushes data centers to pay their own way and bring new, cleaner, and more efficient resources to the grid is a step in the right direction to minimize costs for ratepayers without shutting off economic development from data centers.

Even if you put aside data centers entirely, Pennsylvania ratepayers are projected to continue feeling the pain of high wholesale energy and capacity prices. As shown below, PJM's Independent Market Monitor has consistently reported energy costs on today's grid (in contrast to future-facing capacity costs largely being driven by data center demand growth) are the largest component of wholesale rates.[5]

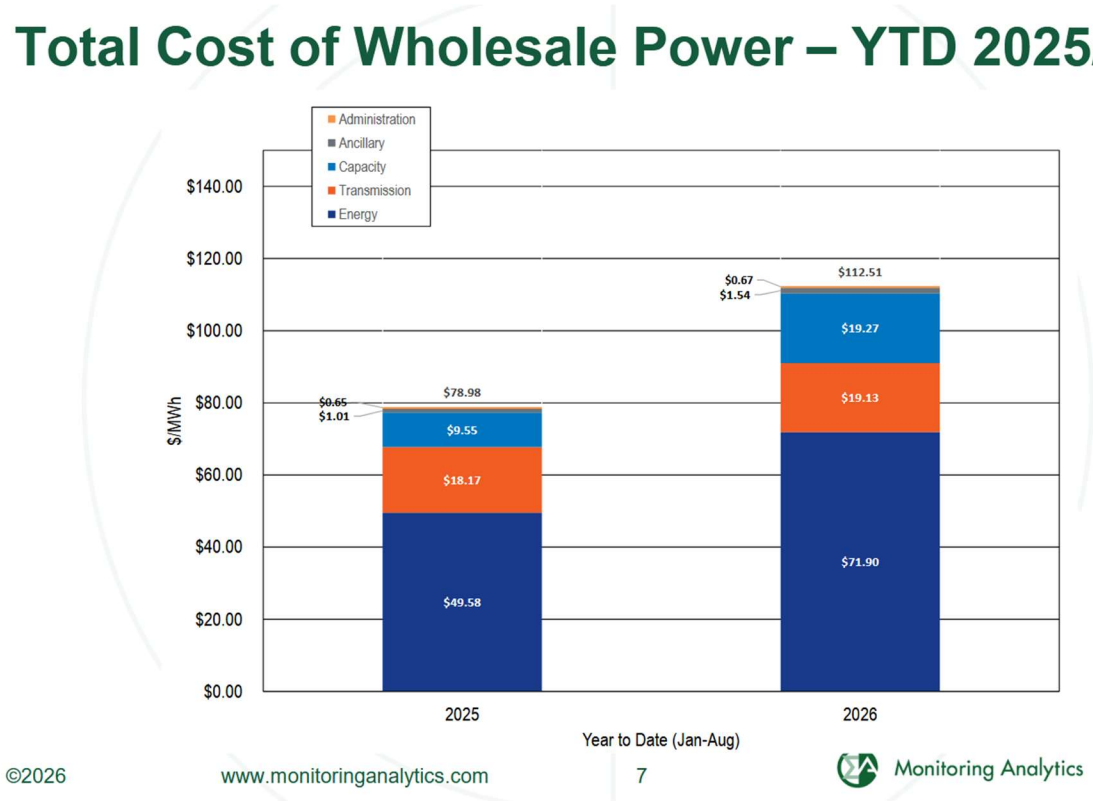

Figure 2: Total cost of wholesale power from PJM's Independent Market Monitor. Note that energy is the largest component of wholesale costs and while capacity has grown at the fastest rate.

[5] Pg 7. https://www.monitoringanalytics.com/reports/presentations/2026/IMM_MC_Market_Monitor_Report_20260928.pdf

Finding #3: In Pennsylvania, resource additions through 2030 are mostly solar and battery storage at between 3 and 7 GW for each resource type.

Large-scale solar and storage, along with a smaller but still relevant amount of distributed solar and land-based wind and Three Mile Island's nuclear retrofit, are expected to come online before 2030 in the Synapse's capacity expansion model. It will be critical to maximize the deployment of these resources to begin stabilizing rates and keep the grid reliable. After all, this report's forecasts are not guaranteed to materialize.

Energy storage will play a new and increasingly important role on the PJM grid providing dispatchable, clean power with substantial capacity value while also firming up renewables and helping thermal power plants operate more efficiently. Energy storage facilities that utilize batteries, similar to those found in an electric car or cellphone, can be built faster than gas or other dispatchable power plants to provide consumer relief and reliability benefits. Intuitively, batteries store power generated on the grid and balance out periods when solar and wind are not producing. Benefits to thermal generation are no less significant. A natural gas or coal plant operates best at a certain heat rate, much like a gas car operates best at a certain RPM. Batteries can store and discharge electricity generated from a thermal power plant so that it can operate at an efficient heat rate for longer than it would ramping up and down purely following grid demand.

For data centers, batteries can act as grid backups, help manage or avoid curtailment, or work alongside thermal generators avoid damage when responding to dramatic spikes or dips in data center usage. If a data center rapidly reduces its power draw or disconnects from the grid in response to voltage disturbances, it can cause further disruption to grid frequency, voltage, and system stability, even damaging equipment. To continue the car analogy, this would be like shifting straight from 6th gear to 1st gear in a fast-moving sportscar.

This issue has become serious enough that the Federal Energy Regulatory Commission (FERC) has ordered an investigation into new reliability standards for integration of "computational loads" from data centers onto the power system.[6] Early indications are that the use of batteries could help mitigate damage to other equipment. According to Bloomberg reporting[7]: "At xAI's Colossus computing facility in Memphis, Tennessee, gas-fired turbines had developed cracks, one of the people said. Batteries were

[6] https://www.willkie.com/-/media/files/publications/2026/07/ferc-orders-new-reliability-standards-for-data-centers-and-other-computational-loads.pdf

[7] https://www.bloomberg.com/news/articles/2026-08-06/data-centers-are-being-damaged-by-ai-s-volatile-power-demand

installed within the system to help smooth out power swings and reduce the strain on spinning turbines."

Large-scale solar and land-based wind can help to lower energy costs on the grid because they supply low-cost electrons in bulk with no fuel requirement. Every electron produced by solar and wind represents fuel savings that ultimately contributes to lower fuel costs as a component of electricity rates and home heating for everyone. Beyond fuel cost savings, solar and wind typically bid into wholesale energy markets at $0 (because the cost of a solar or wind project is static regardless of whether they produce electricity or not) and wholesale prices are set at the marginal cost of supply.

In other words, the wholesale price of energy is set at the bidding price of the most expensive power plant needed to ensure supply is precisely equal to demand—any power plants that bid a higher than marginal cost to deliver electrons in surplus of demand won't receive payment. Any solar or wind on the grid temporarily bumps those more expensive resources out of the market, saving consumers' money. Figure 3 below shows how marginal cost resources set prices in wholesale markets—renewables will almost always be on the left side of the chart, displacing more expensive resources.

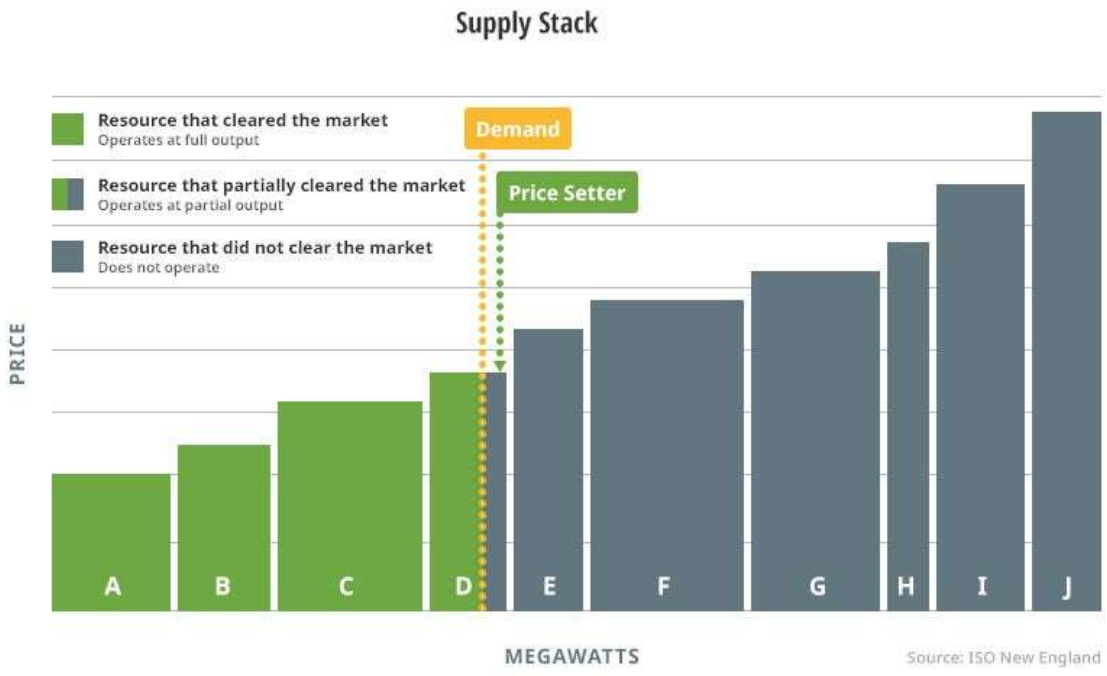

Figure 3: Marginal price setting in wholesale markets

Even in the 2030s, when Synapse's model shows a significant amount of new natural gas capacity coming online, solar and wind provide a valuable diversification benefit. In the no data center scenario, natural gas price increases are the primary driver of energy cost increases. Synapse reports that Henry Hub natural gas prices are expected to jump from sub $4 to above $5/MMBTU.[8] Further, overreliance on natural gas can become a reliability issue itself, as fuel supply constraints or disruptions can threaten grid stability. Gas plays an essential role in supporting PJM's grid reliability today as the single largest generating resource, but this means that consumer prices have heightened sensitivity to fuel costs and adding significant gas resources to the electricity mix is not without risk.

Taken together, I draw from these findings that Pennsylvania will not be able to address reliability concerns driven by data center growth unless more generation is built to serve demand. Solar, storage and onshore wind are the resources that are primarily projected to be built this decade, with the addition of new gas in the 2030s. Affordability, which would remain a problem even without data center growth, is best addressed by prioritizing new generation that can diversify the grid and come online quicky, removing barriers to deployment, and making data centers pay for new generation and transmission needed to meet their added demands on the grid.

Financial barriers to building new generation resources

As the House Energy Committee considers how to bring new generation and storage resources online, it is worth looking back at changes in the investment landscape over recent years. In the early half of the 2020s, prior to 2024's significant uptick in electricity demand, new electricity generation investments in Pennsylvania and PJM were largely being driven by the low fixed cost of solar and wind, as well as policies incentivizing decarbonization, such as the Alternative Energy Portfolio Standard (AEPS) and federal tax credits. Large corporate customers and some utilities were contracting for renewable energy both to secure lower prices and to achieve voluntary environmental goals.

New thermal power plants were built at a lower rate because there was little demand for them in a flat load growth environment. Figure 4 below comes from PJM's most recent load forecast. Note demand growth had been nearly flat for decades but was particularly stagnant from about 2015 through 2024.[9] It is difficult to justify investment of hundreds of millions of dollars into new facilities when existing power plants, often fully depreciated, are meeting demand. Without load growth, there was little reason to build new thermal power plants except when older plants retired or were no longer cost effective—or if there was a non-market factor like decarbonization. Without policies like

[8] Synapse Energy Economics, Inc. *Assessing Electricity Resource Adequacy in Pennsylvania and PJM.* Pg 42.
[9] https://www.pjm.com/-/media/DotCom/library/reports-notices/load-forecast/2026-load-report.pdf

AEPS, PJM would arguably be in a much deeper and more costly generation deficit today, because few (if any) power plants would have been built over the last decade.

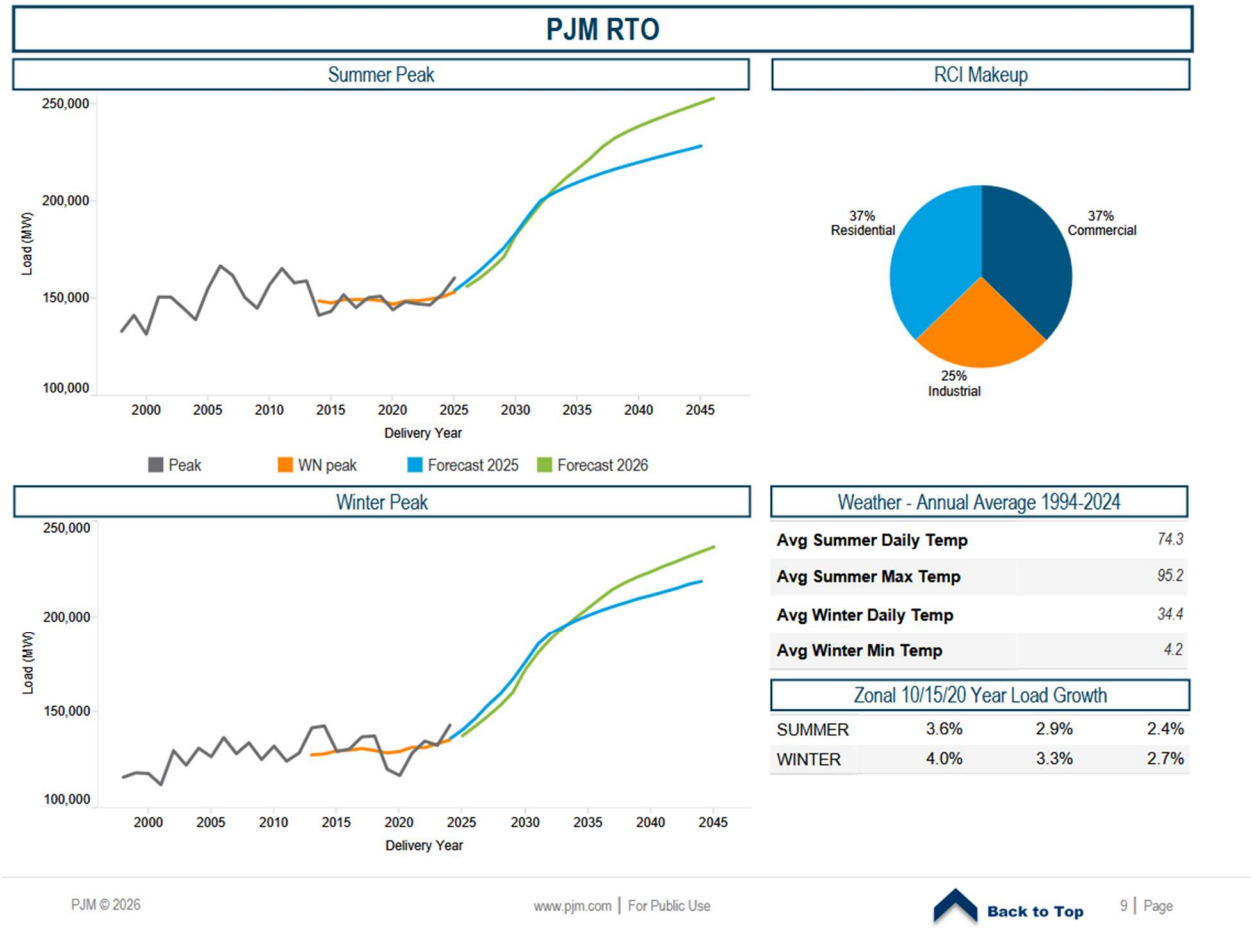

Figure 4: PJM 2026 Load Forecast Report

As described previously in this testimony, the sudden arrival of new load growth in 2024 caused capacity and energy prices to spike upward. Normally, this would send a signal to the market that new power plants (including dispatchable power plants that can provide significant capacity value) are necessary to meet demand. Unfortunately, the largely unexpected and abrupt arrival of demand growth could not be met fast enough with the years-long timeline to develop, connect, finance, and build new generation resources. Solar, wind and batteries, which provide speed to power faster than any other new large-scale resource, still take roughly 5 years on average to move from development to operations.

PJM governors, notably Governor Shapiro, took unprecedented action to protect consumers from paying these higher prices by establishing a price ceiling and floor on the capacity market while the market demand signal could not be met due to the long

development timeline of new power plants. This action has created significant consumer savings, estimated at $45 billion[10], but it has also combined with other factors to undermine investor confidence. Beyond the governors' intervention, factors ranging from illegal federal actions to block permits for wind and solar facilities[11], to the inherent uncertainty of data center demand forecasts[12] have made merchant investments—where a developer sells into and receives wholesale market prices as the only source of revenue (sometimes with Renewable Energy Credits or other incentives on top)—be seen as too risky.

To be clear, I am not criticizing the PJM governors for their actions to protect ratepayers. Given the circumstances, their actions were reasonable. However, Pennsylvania should address the atmosphere of uncertainty by developing new financing models and policies that support investment in cleaner, more efficient power plants needed to keep the grid affordable and reliable. Absent greater certainty, banks and investors are unlikely to commit hundreds of millions, or even billions, of dollars to power plants with 30-plus-year lifespans that depend on increasingly volatile wholesale revenues.

Restoring investor confidence

Power generation investors are now looking almost exclusively for long-term revenue agreements to justify investment amid uncertainty. This is what I hear from a large majority of MAREC members and extends to other power sectors including thermal generators. Project investors and lenders will offer better debt interest rates and required debt service coverage ratios to projects with long-term revenue agreements, which makes it easier for these projects to pencil out and ultimately lowers the cost of producing electricity.

Long-term revenue agreements have long been attractive to large corporate customers, including early data center owners, big box stores, and manufacturers. These companies have leveraged long-term Power Purchase Agreements (PPA) for over a decade to secure access to low-cost electricity from solar and wind projects with zero marginal fuel costs and knowable long-term expenses. In fact, according to the Corporate Energy Buyers Association, corporate customers have signed over 100 gigawatts of PPAs and other clean energy deals between 2014 and 2024, which represents 41 percent of all clean energy capacity added to the U.S. grid in the last decade.[13] By their nature, long-term revenue agreements limit the risk that projects may not earn enough merchant revenue to meet their debt service obligations or their

[10] https://www.pa.gov/governor/newsroom/2026-press-releases/gov-shapiro-secures-extension-pjm-price-cap-saving-consumers--45
[11] https://www.eenews.net/articles/judge-blocks-trump-admins-actions-targeting-wind-and-solar/
[12] https://insidelines.pjm.com/pjm-kicks-off-annual-process-of-vetting-large-load-requests/
[13] https://ceba.org/wp-content/uploads/2025/09/CEBA-Report-Corporate-Demand-Drives-Clean-Energy.pdf

investors' rates of return, which, absent additional revenue sources, could lead to financial distress and potential default.

Unlocking new generation and policy recommendations for the General Assembly

The Pennsylvania General Assembly should consider policies that afford families and small businesses with the long-term price certainty that sophisticated corporate energy users have taken advantage of for years. Namely, long-term contracts or long-term incentive agreements for clean energy, to ensure that new resources waiting in the interconnection queue are built to protect consumers from further price hikes and reliability concerns.

To start with, **the General Assembly should closely monitor PJM's Interim Resource Adequacy Service (IRAS)[14] filing to FERC and, if approved later this year, should act to establish new regulations that facilitate IRAS implementation.** This will entail reforming state-jurisdictional rules that govern plans that utilities and other Load Serving Entities (LSEs) follow when directed by PJM to reduce electricity demand, or load, with a focus on data centers or other large customers that do not bring their own new power generation or storage. While it's too early for MAREC to recommend specific actions until FERC acts, directionally these state actions could build on Governor Shapiro's August 18th Executive Order on data centers. There will be opportunities to implement standards or non-financial incentives for data centers to procure cleaner generation and energy storage through long-term agreements as part of these rules.

Just as data centers and other large customers are protecting themselves by securing power generation through long-term contracts, so too could Pennsylvania families and small businesses with the help of the General Assembly.

MAREC supports Representative Rivera's HB2380 energy storage bill, which makes for a good example of this kind of procurement policy. According to Advanced Energy United, a 3.5 gigawatt battery storage procurement is projected to deliver approximately $400 million in system savings — about **$**29 per household by 2035 — by delaying and avoiding new infrastructure buildout and shaving expensive peak-hour purchases from PJM.[15] HB2380 is silent on the specific procurement mechanism, but MAREC has seen procurements for long-term, fixed-price incentives produce results in Maryland and New Jersey. Last week, Maryland successfully completed the first round of its landmark battery energy storage procurement established in the 2025 Next Generation Energy Act, selecting 440 megawatts of new storage projects for long-term

[14] https://insidelines.pjm.com/pjm-proposes-framework-to-connect-data-centers-without-compromising-reliability-affordability/

[15] https://paenergyfuture.org/#roadmap

incentives at a cost of just 7 cents a month[16] for an average customer. Even though these awards come at a minor initial cost today, they are designed to generate long-term savings if capacity prices continue to rise in PJM. Pennsylvania could consider similar policies to jumpstart storage to get more dispatchable capacity on the grid rapidly, helping to correct the supply/demand imbalance driving prices up.

Pennsylvania could, in a future legislative session, also **consider a requirement for some percentage of so-called "default service" offered by utilities to be sourced through long-term contracts with low-cost energy resources, including solar and wind projects.** Currently, most utilities operate on a six-month cycle where their prices are updated based on their operating costs and the supply they have procured through comparatively short-term agreements. Long-term contracts need not be above market rate, in fact, there should be guardrails in place to ensure customers see savings from such long-term agreements. The general idea of a long-term utility contract is to hedge a portion of consumers' electricity service against price spikes from year to year. Like a long-term mortgage, these arrangements help consumers budget appropriately for their energy bills. PJM's recently filed Reliability Backstop Procurement (RBP)[17], to secure additional power supply to address reliability concerns, similarly leverages contracts of up to 15 years to fill a shortfall in the most recent PJM capacity auction. A Pennsylvania long-term contract requirement would help create a continued development pipeline for projects beyond the one-time nature of the RBP and would provide both energy and capacity price stability.

In addition to the changing investment landscape, new power plants continue to face chronic challenges related to siting approvals and transmission constraints. Achieving the forecasted generation deployment in Synapse's report and maintaining resource adequacy will require clearer rules around permitting and more predictable transmission interconnection costs. Even as PJM moves more quickly to study projects and move them out of the interconnection queue, which does not mean they will ultimately be permitted or be able to achieve financing with high interconnection costs.

Pennsylvania's local jurisdiction over the siting of power plants presents a challenge in the face of reliability concerns. Local governments have an important role in vetting projects, but they do not have a decision-making framework that considers whether a project is needed to keep the lights on. How can the Commonwealth ensure that local governments say yes to enough projects to maintain resource adequacy? We recommend, at a minimum, establishing clear statewide guardrails around local siting requirements. Senator Yaw's SB349, now passed into law, established Pennsylvania-wide solar decommissioning regulations. This was a great first step toward standardizing siting requirements. Establishing siting standards ensures that public

[16] https://psc.maryland.gov/news/2026/maryland-public-service-commission-announces-first-round-energy-storage-awards/

[17] https://www.pjm.com/-/media/DotCom/about-pjm/newsroom/fact-sheets/reliability-backstop-procurement-fact-sheet.pdf

health and safety is protected while also ensuring businesses are not over-regulated and landowner rights are not unduly denied. Every renewable energy project and energy storage project in Pennsylvania has the support of private landowners and in the worst-case local governments can act like oversized HOAs denying free use of private property. **We support Rep. Steele's House Bill 2651 to expand the concept of siting standards for solar, wind and storage resources.**

Finally, transmission costs have increasingly stymied the deployment of new generation resources that successfully exit the queue. Upon exiting the interconnection queue, generators are assigned a share of the cost for transmission upgrades needed for their projects to safely plug into the grid, but these costs have become increasingly prohibitive as the aging transmission grid reaches and exceeds capacity. FERC Order 1920, once PJM's states and transmission owners reach a final cost allocation agreement, will provide an important pathway to forward planning for transmission that can consider load growth, state and community priorities and preferences, the generation interconnection queue, and other important considerations. The **Commonwealth can and should develop a sense of priorities for transmission expansion that can feed into the Order 1920 planning process, which prioritizes state input.**

In closing:

1. Pennsylvania needs more electricity generation to support reliability and affordability. It is important to distinguish that there is a smaller but significant baseline need for new generation investments independent of data center growth.
2. The Synapse model shows it is cost effective and necessary for solar, wind and battery deployment to accelerate over the balance of the decade and continue into the 2030s—eventually augmented next decade by new, efficient gas and potentially new nuclear when those resources can come online.
3. Modeled deployment is not guaranteed; the reliability projection could be worse if the Commonwealth misses the level of generation deployment forecasted by Synapse.
4. Financing generation now requires long-term revenue arrangements.
5. Siting barriers and transmission congestion remain chronic problems.
6. Acting on bills like Rep. Rivera's storage procurement bill and Rep. Steele's siting bill are a great start. Enacting implementing rules for IRAS, especially that facilitate near-term deployment of new clean energy and batteries, are critical once FERC approves PJM's filing.
7. Other actions, including long-term contract requirements for solar, wind and other resources should be evaluated next legislative session to determine what consumer benefits may exist.

Thank you again for the opportunity to testify. I look forward to your questions and to working with the General Assembly to advance affordable, reliable energy solutions for Pennsylvanians.

Best regards,

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