November 21, 2025

U.S. Department of Energy
Via email: SpeedtoPowerRFI@hq.doe.gov

RE: RFI Response – Accelerating Speed to Power

Information requested by RFI
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Primary area of expertise or focus relevant to this RFI: electricity generation, project development, manufacturing

The Solar Energy Industries Association (SEIA) is the national trade association of the U.S. solar and storage industry, which employs 280,000 Americans. SEIA represents over 1,200 organizations that manufacture, install, and support the development of solar and storage projects. Collectively our members have added 140 gigawatts to the U.S. grid since 2020, representing over half of the generating capacity added over that time.

On behalf of our member companies, SEIA appreciates this opportunity to provide input on the U.S. Department of Energy's ("DOE") Request for Information ("RFI"), issued in the notice Accelerating Speed to Power/Winning the Artificial Intelligence Race: Federal Action To Rapidly Expand Grid Capacity and Enable Electricity Demand Growth, 90 Fed. Reg. 45032 (Sept. 18, 2025).

I. Introduction

President Trump is correct that we must "sustain and enhance America's global AI dominance in order to promote human flourishing, economic competitiveness, and national security."[1]
To do this, we will need more sources of affordable, reliable, and secure energy. Every source of energy at our disposal should be a part of powering America's AI revolution, and solar and

[1] Executive Order 14179, "Removing Barriers to American Leadership in Artificial Intelligence" (January 23, 2025).

storage are the only sources that are available at the scale needed *today*, and through the rest of the decade, to do so. Solar energy is readily abundant, and the United States has some of the richest solar resources in the world. The recent on-shoring of the solar energy supply chain, is positioning our nation as a geostrategic technology leader, while reducing trade deficits.

But the ability to unleash the full potential of solar and storage resources, and maintain America's position as the global leader in AI, remains stymied by onerous and unstable permitting policies and insufficient transmission capacity. Over 110 GW of new generation capacity are at risk of not coming online in the next four years due to recent policies on permitting clean energy. The projects that get through the unpredictable permitting process face limited transmission capacity on an aging grid. With 116 GW of large loads currently under construction,[2] the U.S. is not only risking ceding its AI dominance, but also a significant reliability crisis. Swift action by the DOE to increase transmission investment and ensure efficient and stable permitting will allow the U.S. to power the AI innovations of tomorrow.

II. RESPONSE TO RFI 2: IDENTIFYING THE PROBLEM

A. Loads are growing, but the rate of growth is unclear.

After decades of flat power demand, the grid is now seeing significant increases in load growth.[3] Recent conservative estimates show that energy demand from U.S. data centers is expected to reach 606 terawatt-hours (TWh) by 2030, which is a drastic increase from the 147 TWh demand in 2023.[4] There are currently 116 gigawatts (GW) of large load capacity either committed or under construction.[5] Data centers currently make up 3.7% of the U.S. total energy demand, and this is projected to increase to 11.7% by 2030.[6]

Energy-intensive AI infrastructure is developing at a much faster pace than the development of the generation needed to serve it.[7] Adding to the complexity of AI infrastructure growth is that

[2] Wood Mackenzie, US utilities have committed to 116 GW of large load capacity growth, equal to 15.5% of current US peak demand (Sept. 4, 2025), https://www.woodmac.com/press-releases/us-utilities-have-committed-to-116-gw-of-large-load-capacity-growth-equal-to-15.5-of-current-us-peak-demand/ ("WoodMac Large Load Report").
[3] John Wilson and Zach Zimmerman, "The Era of Flat Power Demand is Over" at 4 (December 2023), *available at* https://gridstrategiesllc.com/wp-content/uploads/2023/12/National-Load-Growth-Report-2023.pdf ("Grid Strategies Load Growth Report").
[4] Alastair Green et al., "How Data Centers and the Energy Sector can Sate AI's Hunger for Power" (September 17, 2024), *available at* https://www.mckinsey.com/industries/private-capital/our-insights/how-data-centers-and-the-energy-sector-can-sate-ais-hunger-for-power#/ ("Green AI Power Report").
[5] WoodMac Large Load Report.
[6] Green AI Power Report.
[7] *See Long-Term Load and DER Forecasting*, Energy Systems Integration Group, at 29 (2025) https://www.esig.energy/long-term-load-and-der-forecasting/. ("Data center load growth is the single largest

grid operators do not fully understand the impacts of new data center loads on the grid, and existing forecasting practices are ill-equipped to capture them accurately. Data centers often submit multiple interconnection requests for the same project,[8] and some hyperscalers have acknowledged engaging with multiple utilities simultaneously for a single facility.[9] The use of utility load forecasts in processes that determine wholesale rates and transmission planning has also raised questions about their transparency and accuracy.[10] Vertically integrated utilities, in particular, lack incentives to scrutinize load requests, since they stand to benefit financially from capital investments that expand their rate base.[11]

Compounding these challenges is the fact that data center loads are not uniform, leading to widely varying grid impacts. The effect of a new data center on the grid depends heavily on its operational profile and whether it is co-located with generation.[12] Some large loads can operate islanded from the grid and accept the risk of outages, while others require firm backup service. Certain loads are flexible and can respond to price signals or participate in demand response programs. Each arrangement "is going to be a snowflake…they are going to have their own design, their own concerns, their own issues, their own configurations that they would like to meet."[13]

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component of growth in utility load forecasts and is expanding at an unprecedented rate, with forecasts ranging between 65 GW and 90 GW of new load by 2029"); Grid Strategies, *supra* note 2 at 6 ("It may take only one or two years to connect new load to the grid, while it may take over four years to bring new generation online and even longer to build new transmission.").

[8] *Uncertainty and Upward Bias are Inherent in Data Center Electricity Demand Projections*, London Economics Inc., at 8 (July 7, 2025), available at https://www.selc.org/wp-content/uploads/2025/07/LEI-DataCenter-Final-Report-07072025-2.pdf.

[9] Chairman Doug Scott, Illinois Commerce Commission at 5, (May 27, 2025), available at https://www.ferc.gov/media/chairman-doug-scott-illinois-commerce-commission ("[W]e need to have a better understanding of what load growth is real…The RTOs get their load forecasts from the utilities; however, every utility is different in how they establish their load forecast. Some of the hyperscalers admit to talking to multiple utilities at any given time. It is quite possible that there is double-counting in forward-looking load forecasts, especially given that these data center projects are developed under non-disclosure agreements. Recently, certain data center projects have been cancelled, undermining previous load projections.").

[10] Electricity Customer Alliance, et al., *Joint Letter to FERC re Load Forecasting*, at 1 (May 30, 2025), https://static1.squarespace.com/static/61cb4ad27eb866577fe066fe/t/683dad0998acf67ccdbb63e2/1748872457167/Joint+Customer+Letter+to+FERC+re+Load+Forecasting+5.30.25.pdf.

[11] *See* London Economics Inc., *supra* note 8.

[12] Clean Energy Buyers Association Pre-filed comments at 5, Docket No. AD24-11; Talen Energy Pre-Filed Comments at 1-3, Docket No. AD24-11 ("Talen has been . . . safely operating co-located loads for over 18 months.").

[13] Transcript, *Technical Conference Regarding Large Loads Co-Located at Generating Facilities* at 61, Docket No. AD-24-11 (Nov. 1, 2024). (statement of Aubrey Johnson, Vice President, System & Resource Planning, Midcontinent Independent System Operator).

B. No matter the scale of growth, the current transmission system is ill-equipped to address growing load.

Even though the scope of load growth is unclear, the fact that load is growing is indisputable. And unfortunately, existing grid infrastructure is ill equipped to serve this growth. The grid is aging. Over 70% of the transmission and distribution system assets are past the midpoint of their 50-year life expectancy, with some components over 100 years old.[14] Grid expansion continues to grow at an alarmingly slow rate. Utility investment in transmission to serve new load has *decreased* over the past three years, according to data from Edison Electric Institute. In 2021, expansion-related transmission capital expenditures declined to $8.8 billion for 2023.[15] The rate of transmission being built has dropped dramatically, going from an average of 1,700 miles per year in the early 2010s to 350 miles per year between 2020 and 2023.[16]

The ability to build or upgrade transmission is currently limited by supply chain constraints. U.S. demand for power transformers and generation step-up transformers has increased 116% and 274%, respectively.[17] With growing demand, and inadequate domestic and global supply, there is an increasing reliance on imports of these assets.[18] The lead times for these assets are upwards of 144 weeks.[19] While the deficits for higher-voltage transformers are expected to ease significantly over the next five years, there remains considerable uncertainty due to the volatile political climate.[20]

Siting and permitting new transmission is complicated by the scale of such projects and the need to coordinate across numerous state and local jurisdictions, each of which can slow or halt a project completely.

These transmission trends must turn around. In order to meet new energy demand, average within-region transmission needs to increase by 64%, while interregional transmission needs to

[14] Large-Scale Transmission Deployment Saves Consumers Money, at 9 (June 2025), https://gridstrategiesllc.com/wp-content/uploads/GS_Transmission-Deployment-Saves-Consumers-Money_vf.pdf ("Large-Scale Transmission Deployment Report").
[15] Grid Strategies Load Growth Report at 6.
[16] Large-Scale Transmission Deployment Report at 9.
[17] Wood MacKenzie, Untangling the US transformer supply chain crisis (Aug. 13, 2025), https://www.woodmac.com/news/opinion/transformer-troubles-manufacturing-and-policy-constraints-hit-us-transformer-supply/
[18] *Id*. at 3.
[19] *Id*.
[20] *Id*. at 6.

increase by 128%.[21] This investment is necessary not only to serve the needs of new loads, but to meet national energy objectives, including supporting domestic manufacturing, and enabling increasingly energy-intensive computing. With transmission costs increasing, and investment decreasing, DOE funding can help spur investment and ensure American Energy Dominance.

III. Response to RFI 3: Identifying the Solution

A. Transmission Funding Assistance

Several existing programs are readily available to the DOE to encourage transmission investment and development, including the Transmission Facilitation Program (TFP) and the Loan Programs Office. Under the TFP, the DOE has access to up to $2.5 billion to help build new interregional transmission lines, through loans, anchor customer contracts, and public-private partnerships.[22] This is a revolving fund, that allows the DOE to recover its investments through capacity contracts and reinvesting those proceeds into future transmission projects. The TFP is an especially suitable and useful method of financial support for interregional projects, and could be useful in helping address cost allocation issues. By providing funding through a precedent transmission service agreement or a capacity contract, the DOE could ensure that funds are allocated to the transmission project, without worrying about which set of customers pay. The DOE could then resell the contract to third parties.

The LPO finances energy and manufacturing projects that meaningfully contribute to U.S. energy security, grid reliability, and lowering costs for all Americans.[23] LPO funds could be used to invest in the manufacturing needed to develop the domestic supply chain for transmission assets, reducing reliance on imports and speeding up the build out of transmission.

B. Technical Assistance on Coordination of Permitting Issues and Load Growth

In addition to providing funding, the DOE can play a critical role in coordinating federal and state actions to address these reliability risks, prevent unnecessary cost escalation, and ensure staffing and institutional capacity are sufficient to carry out these programs effectively. As discussed below, in addition to the transmission and supply chain issues, permitting uncertainty remains a critical constraint to ensuring American energy dominance. SEIA urges the DOE to

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[21] Department of Energy, National Transmission Needs Study, at vii (October 2023) https://www.energy.gov/sites/default/files/2023-12/National%20Transmission%20Needs%20Study%20-%20Final_2023.12.1.pdf ("National Transmission Needs Study").
[22] https://www.energy.gov/gdo/transmission-facilitation-program
[23] https://www.energy.gov/lpo/loan-programs-office

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coordinate with relevant permitting agencies to ensure that late-stage energy projects in areas close to new loads are able to promptly receive permits, which would allow these projects to come online faster.

Additionally, DOE and national laboratory expertise can be used to identify best practices in load forecasting. As stated above, there is inconsistency in how load is forecasted between various regions, and even within regions. Establishing uniform models of load forecasting will enable transmission providers to build transmission systems and facilitate the interconnection of new generation that can efficiently serve new large loads.

IV. Response to RFI 5: Additional Constraints to Consider

The ability to serve the increasing and significant demand from data centers and advanced manufacturing is not only constrained by the lack of sufficient transmission, but also by the inability to get new generation online fast enough. Reserve margins are shrinking. In filings before the Federal Energy Regulatory Commission (FERC), PJM Interconnection, L.L.C. stated that it may see the erosion of its reserve margin starting as soon as 2026.[24] The Midcontinent Independent System Operator, Inc. similarly stated that it is "at a high risk of experiencing electricity supply shortfalls beginning in Summer 2025."[25] Southwest Power Pool, Inc. expects an approximate 17 GW capacity shortfall by 2030.[26] But at a time when grid operators should be focusing their attention on processing their queues as fast as possible, they are instead shifting their attention to flawed proposals that would prioritize new gas resources over the existing projects in the queue. To solve this problem, the administration needs to put in place policies that would ensure that resources under development can complete that development without impediment.

[24] PJM Interconnection, L.L.C., Reliability Resource Initiative, FERC Docket No. ER25-712-000 (Dec. 13, 2024). Despite PJM's statements regarding the potential capacity shortfall to support Reliability Resource Initiative (RRI), of the 51 projects selected for RRI, 41 of those projects would not reach commercial operation under at least 2027. *See* https://www.pjm.com/-/media/DotCom/committees-groups/committees/pc/2025/20250506/20250506-rri-addendum---post-meeting.pdf; Midcontinent Independent System Operator, Inc., Supply Friction (April 14, 2025), https://cdn.misoenergy.org/20250410%20Futures%20Redesign%20Workshop%20Item%2002%20Supply%20Friction690964.pdf.

[25] Midcontinent Independent System Operator, Inc., Expedited Resource Addition Study Filing, FERC Docket No. ER25-1674 (March 17, 2025) (citing *NERC's 2024 Long-Term Reliability Assessment* (published Dec. 2024), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_Long%20Term%20Reliability%20Assessment_2024.pdf.)

[26] Southwest Power Pool, Inc., Expedited Resource Adequacy Study at 2, FERC Docket No. ER25-2296 (May 22, 2025).

A. Natural gas cannot come online fast enough to serve new large loads.

Electric utilities have been struggling to keep up with projected data center energy demands as generation and transmission projects are bottlenecked by various constraints and shortages. Natural gas combustion turbine plants, with potentially high fuel and pipeline infrastructure costs, are specifically designed to provide extra power during short periods of high demand and are not economic to run around the clock.[27] Natural gas combined cycle plants, while designed to run at higher capacity factors, have recently seen sizable increases in costs and supply chain delays.[28] Gas plants also must be located near existing major gas pipelines, which similarly face long development and construction timelines. Large gas plants can be the most challenging type of energy project to develop due to permitting, supply chain, labor, and other issues. Further, all natural gas generators are exposed to potential fuel price increases and volatility, making their lifecycle costs unknowable and increasing commercial risks for offtakers.

Recently, these obstacles have led to large delays and cancellations for planned natural gas generation projects. For example, in February 2025, Engie withdrew two natural gas projects in Texas meant to help meet data center energy demand due to "equipment procurement constraints, among other factors."[29]

B. The manufacturing infrastructure to build solar and storage resources exists to serve the growing load.

Today, it may take between two to four years to develop a data center.[30] However, from 2015-2020, the average construction timelines ranged between one and three years. Contributing to the increase in construction timelines is the decreasing availability of energy from the grid and increasing constraints on the supply chains for major grid equipment. Supply chain delays and grid limitations are not easy to fix in the short term, as they require significant investment in the on-shoring of manufacturing for large grid equipment.

The domestic supply chains for solar equipment are robust, making these the fastest energy resources to develop and deploy. Solar energy has become the proven leader in U.S. energy

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[27] Natural gas-fired combustion turbines are generally used to meet peak electricity load, EIA.gov (Oct. 1, 2013), https://www.eia.gov/todayinenergy/detail.php?id=13191.
[28] *See* CTVC, Gas turbine gridlock (March 10, 2025), https://www.ctvc.co/gas-turbine-gridlock-236/.
[29] *See* Engie's pulled project highlights the worsening economics of gas, (Feb. 25, 2025), https://www.latitudemedia.com/news/engies-pulled-project-highlights-the-worsening-economics-of-gas/.
[30] CBRE, High Demand, Power Availability Delays Lead to Record Data Center Construction (Sept. 14, 2023) https://www.cbre.com/insights/briefs/high-demand-power-availability-delays-lead-to-record-data-center-construction.

technologies. In 2024, the U.S. installed a record-breaking 50 GW of new solar capacity, the largest single year of new capacity added to the grid by any energy technology in over two decades. In addition to historic deployment, surging U.S. solar manufacturing emerged as a landmark economic story in 2024. Domestic solar module production tripled last year, and at full capacity, U.S. factories can now produce enough to meet nearly all demand for solar panels in the country. Domestic solar cell manufacturing also resumed in 2024, strengthening America's energy supply chain and cementing its place as a solar powerhouse.[31]

The rapid deployment of solar and storage to meet growing energy demand is encouraging a more secure and resilient U.S. energy supply chain. There has been a wave of U.S. solar and storage manufacturing investments in response to strong deployment demand and direct manufacturing incentives. The U.S. solar and storage industries have cumulatively committed or announced over $47 billion in manufacturing investments. These facilities will have the ability to directly employ over 67,000 Americans as they scale. In addition, the solar and storage manufacturing economic engine touches most U.S. states. Forty-one states already have an operational solar or storage manufacturing facility. Most states have multiple facilities.[32]

While the investment data is staggering, it is an underestimate. It only reflects what companies are willing to publicly share. The data also only includes direct manufacturing investments. Manufacturing is one of the largest economic multipliers. According to the National Association of Manufacturers, for every dollar spent on manufacturing, there is a $2.64 impact on the overall economy.[33] Manufacturing investments have ripple effects across the economy since they create demand for materials, logistics, warehouses, services, infrastructure investments, and more. Fully understanding the impact of U.S. solar and storage manufacturing on American economic growth goes beyond what is happening on the factory floor.

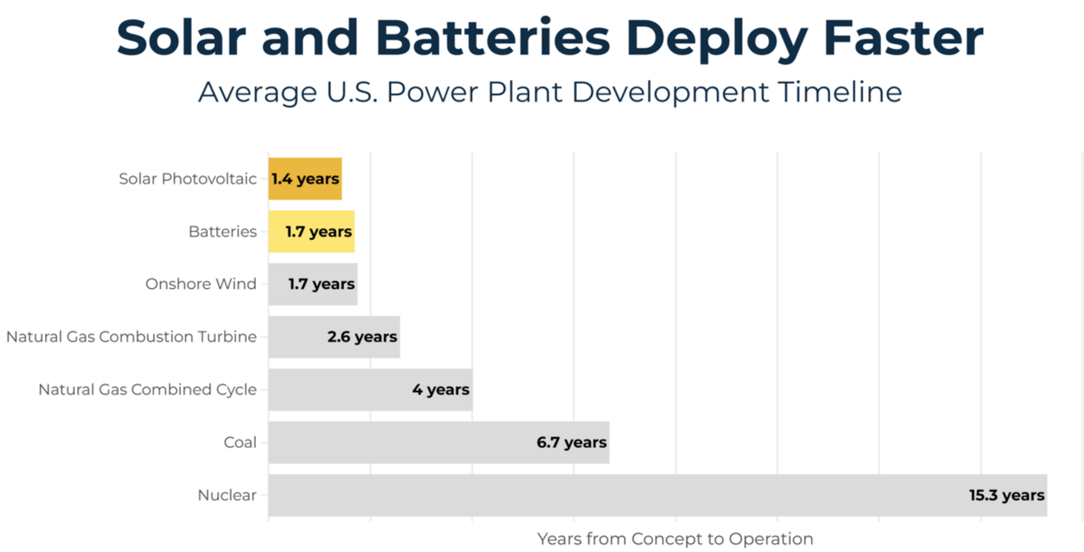
C. Solar and storage are the fastest energy resources to develop and deploy, under the right permitting regime.

Speed to market is the most critical factor in meeting pressing data center energy demands, which cannot wait for other energy resources to begin production in 2030 or later.
Solar energy and battery energy storage are the fastest grid assets to deploy and have the most robust domestic and global supply chains capable of meeting the scale of electricity demand

[31] "Solar Market Insight Report: Q4 2024," SEIA and Wood Mackenzie, (March 11, 2025), *available at* https://seia.org/research-resources/us-solar-market-insight/.
[32] Solar Energy Industries Association, Solar & Storage Supply Chain Dashboard, https://seia.org/research-resources/solar-storage-supply-chain-dashboard/.
[33] National Association of Manufacturers, Facts About Manufacturing, https://nam.org/mfgdata/facts-about-manufacturing-expanded/.

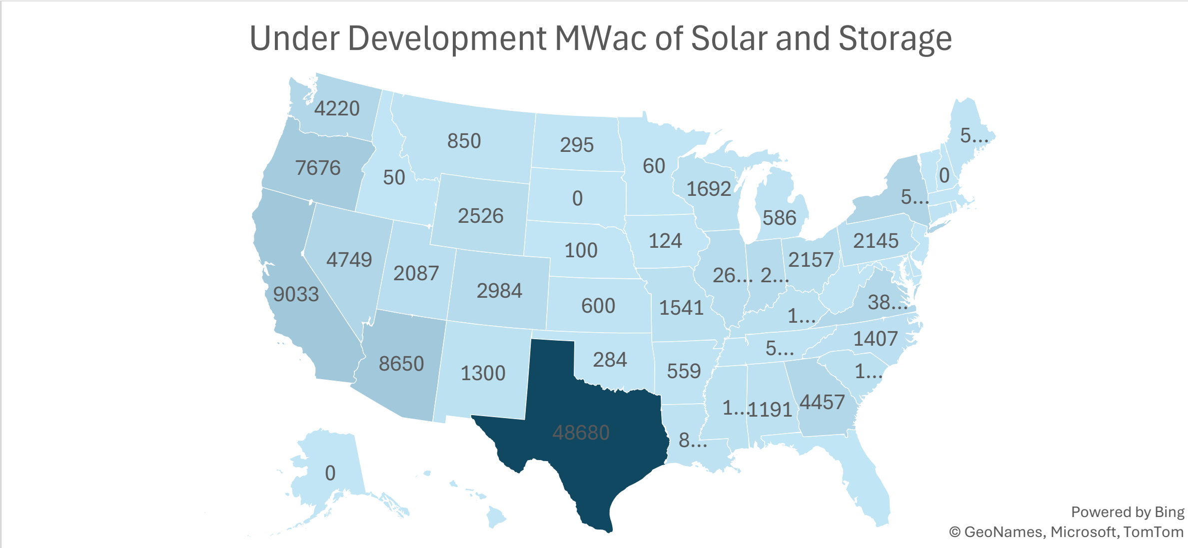
growth expected over the next several years. Removing unnecessary red tape will enable solar and battery energy storage to meet that demand at the lowest possible cost.

Developing a utility-scale solar project typically takes only 1.4 years, and batteries only 1.7 years. The table below illustrates how these timelines are much faster than all other available energy technologies.[34]



Currently, there are 87.1 GW of solar and 46.9 GW of storage under development, representing 74% of all capacity under development scheduled to come online 2026-2030. Below is a map of where those projects are being developed.

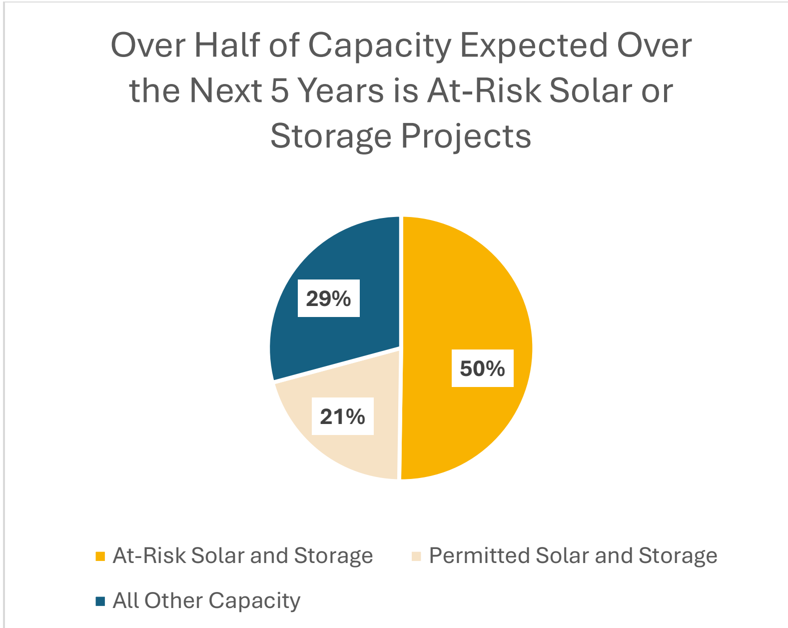
[34] SEIA analysis of U.S. Energy Information Administration (EIA) Form 860M data for plants that have started reporting to EIA prior to seeking regulatory approval and plants which have reached operating status.



However, under the current permitting regime, all solar and storage projects that have not yet received their full suite of permits could potentially be harmed, slowed, or cancelled.

For decades the permitting process for clean energy infrastructure has been unstable, unpredictable, and time and resource intensive. This Administration proclaimed a policy of U.S. energy dominance, rolling back regulations and expediting permits to accelerate fossil fuel, coal, and nuclear development. However, those policies do not extend to permitting solar and storage projects that are most able to supply fast, cheap, and stable power to the grid.

The current complete moratorium on permitting solar and storage projects is making a permitting system that needs improvement even worse and the future impacts to energy supply is vast. Rather than accelerating the development of new generation, the existing regime is accelerating a resource adequacy problem. SEIA analysis of planned power plant data finds that the completion of over 71 GWac of solar and 42 GWac of storage (which is frequently located with solar) capacity is at risk over the next four years due to recent policies on permitting clean energy. Solar represents over 60% of all generation capacity planned to come online through 2029, and delays to buildout threaten electricity supply and bills across the country.



The most realistic way to get more electrons on the grid is with solar energy backed by batteries. The administration must remove the barriers for these resources to do so.

V. Conclusion

SEIA supports the DOE's Speed to Power Initiative. Under DOE's leadership, the Administration can unlock the energy and infrastructure necessary to power the AI innovations of tomorrow.