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Mapping the Barriers to Electricity Generation Development in Pennsylvania

Prepared for Clean Tomorrow

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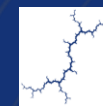
Summary

Pennsylvania's current siting ordinances restrict solar, not gas

- Customer-initiated withdrawal is the main mode of attrition for Pennsylvania-based energy projects in the PJM queue, likely reflecting problems outside the queue process itself (like local ordinances and public opposition) and/or challenges identified in the first phase of queue requirements.
- Community concerns, restrictive ordinances and discretionary interpretation of these ordinances, court delays, and settlement uncertainty have created barriers for proposed solar, wind, and battery energy storage projects in Pennsylvania. Seventy-five percent of Pennsylvania-based renewable projects that entered the PJM queue since 2023 have withdrawn, representing 82 percent of renewable capacity that entered the queue over that period.
- Meanwhile, all 11 Pennsylvania-based gas plant interconnection requests since 2023 (totaling about 8 GW) involve upgrades at existing plants that do not require additional siting approval or lack sufficient information to determine otherwise.
- The siting bill introduced in the Pennsylvania legislature (HB 2651) could streamline over 900 provisions for solar energy facilities across counties and jurisdictions, superseding specific restrictions in 10 counties and 198 jurisdictions while also reducing overall burdens.
- Even if the siting legislation were technology-neutral, its provisions still would not have impacted any of Pennsylvania's recent gas interconnection requests (at least those for which we had sufficient information), since they were all sited at existing plants rather than new sites.
 - For example, the RESET Board bill (HB 502), though technology-neutral, would not have facilitated any of the gas projects we examined.

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Background

Proposed legislation could reshape Pennsylvania's siting process

- Pennsylvania is one of just 13 states where municipalities hold sole authority over siting wind and solar generation facilities.⁽¹⁾
- Legislators in Pennsylvania have introduced two siting-related bills: one **establishing a state permitting board** (HB 502) and another **introducing siting reforms for renewable energy projects** (HB 2651).
- Clean Tomorrow hired Synapse Energy Economics, Inc. (Synapse) to evaluate the barriers to electricity generation development in Pennsylvania and assess the potential impact of the proposed legislation.

In this report, we aim to answer the following research questions:

- *Is electricity generation development particularly challenging in Pennsylvania?*
- *To what extent is the interconnection queue the bottleneck compared to local siting and permitting?*
- *Would the proposed siting legislation make it easier to build resources, and would it have a differentiated impact on solar versus gas?*

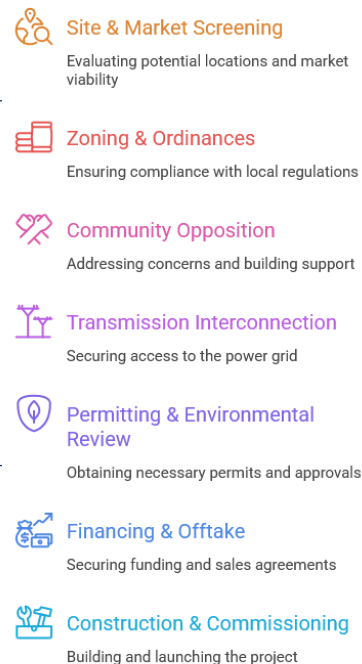
Our approach is as follows:

- *Analyze PJM interconnection queue data to characterize the regional development landscape*
- *Conduct case studies of renewable and gas projects to trace their development pathways*
- *Assess the technology-neutral bill's likely effect on existing solar ordinances in Pennsylvania*

(1) Breckel, A., N. Falkenburg. 2025. *Insight Report: State Policy Approaches to Renewable Energy Siting*. Clean Tomorrow. Available at: https://sittingsolutions.com/wp-content/uploads/2025/04/cleantomorrow_siting-solutions-project_insight-report.pdf.

Public data provides useful insight into the project development process

This analysis focuses on these stages and how they have narrowed new renewable energy projects in Pennsylvania



- A given energy project may encounter obstacles at different stages of development
- We used **PJM queue data** to initially indicate whether projects were canceled because of the queue process ("customer milestone not met") or external factors that could be related to market viability, local ordinances, etc. ("customer initiated withdrawal")
- However, this distinction is imperfect. Developers are required to submit various information and payments throughout the PJM queue process, and a missed milestone can stem from the same causes as a withdrawal. For example, a developer denied local permitting may abandon its queue position and miss the next milestone, rather than formally withdrawing.
- **Case studies** are needed to fully understand why individual projects fail– we evaluated recent renewable and gas projects proposed in Pennsylvania
- We also assessed how proposed **siting legislation** in Pennsylvania would affect solar ordinances in the state

Interconnection, siting, and permitting are potential barriers to project development in Pennsylvania

In this analysis, we focus on a subset of the challenges projects can face, grouped into several categories:

PJM Grid Operator Queue

- Projects must move through a **multi-phase study process** before receiving an interconnection agreement to connect to the grid
- Projects can be withdrawn either by the developer or by PJM if required milestones are not met

Project Siting

- Local **zoning and land-use ordinances** determine where a project can be built
- Developers must comply with jurisdiction-specific policies (e.g., setbacks, height/noise/lighting limits)
- Many projects require discretionary approval from a local zoning hearing board

Permitting

- Gas plants must obtain state and federal **air quality and other environmental permits** before construction
- In Pennsylvania, the Department of Environmental Protection (PA DEP) manages this process

The PJM interconnection process consists of several phases and decision points



In 2023, PJM reformed its interconnection process by shifting from a “first-come, first-served” serial queue to a cluster-based **“first-ready, first-served” cycle** approach. PJM received applications for more than 800 projects or 220 GW in the first cycle of the reformed process. The processing time for issuing new generation interconnection agreements is now one to two years.⁽¹⁾

Throughout the process, developers are required to submit **technical information, deposits**, and evidence of **site control**.

		Site Control Term		
		Generating Facility	Interconnection Facility	Interconnection Switchyard
Submission 1 Application Phase	Full	100% Deed Lease Option (See Note 1)	Not Required	Not Required
Term Requirement		1 year from Application Deadline		
Submission 2 Decision Point 1 (See Note 2)	Partial	100% Deed Lease Option	50% Deed Lease Option Right-of-Way	50% Deed Lease Option
Term Requirement		1 year from last day of Phase 1		
Submission 3 Decision Point 3 (See Note 3)	Full	100% Deed Lease Option	100% Deed Lease Option Right-of-Way	100% Deed Lease Option (See Note 4)
Term Requirement		Additional 1 year from last day of Phase 3 (for Transition Cycles #1 and #2) Additional 3 years from last day of Phase 3 (for new Cycle)		

 = 100% Site Control Required
  = 50% Site Control Required

Source: PJM. 2026. PJM Manual 14H: New Service Requests Cycle Process. Available at: <https://www.pjm.com/-/media/DotCom/documents/manuals/m14h.ashx>

(1) PJM. 2026. Fact Sheet: New, Faster Generation Interconnection Process. Available at: <https://www.pjm.com/-/media/DotCom/about-pjm/newsroom/fact-sheets/interconnection-reform-progress-fact-sheet.pdf>

Each PJM queue phase requires a system impact study

Phase 1 System Impact Study

- PJM conducts load flow analysis to identify any high-level grid impacts
- PJM and transmission owners identify required interconnection facilities and network upgrades
- Project developer reviews results of the study and decides whether or not to move to Phase 2 (Decision Point 1); requirements include:
 - Study and readiness deposit
 - Document and maintain site control
 - Evidence of air and water permits, if applicable
- PJM can determine if projects qualify to accelerate to drafting a final interconnection-related agreement

Phase 2 System Impact Study

- PJM adjusts their analysis based on updated information from the project developer; voltage, short circuit, and stability analyses; estimating firm network upgrade scope and cost
- Transmission owner performs a facilities study for the physical interconnection facilities
- Project developer reviews results of the study and decides whether or not to move to Phase 3 (Decision Point 2); requirements are similar as for Phase 1

Phase 3 System Impact Study

- Additional adjustments and verifications; similar requirements as previous phases, plus 100% site control over project footprint and interconnection facilities, fuel and water delivery agreements as applicable, evidence of necessary permits, Memorandum of Understanding for equipment purchase ⁽¹⁾

(1) PJM. 2026. *PJM Manual 14H: New Service Requests Cycle Process*. Available at: <https://www.pjm.com/-/media/DotCom/documents/manuals/m14h.ashx>

PJM Queue Data Analysis

Key Takeaways from PJM Queue Data Analysis

Most Pennsylvania-based energy projects that have entered the PJM interconnection queue since 2023 have withdrawn

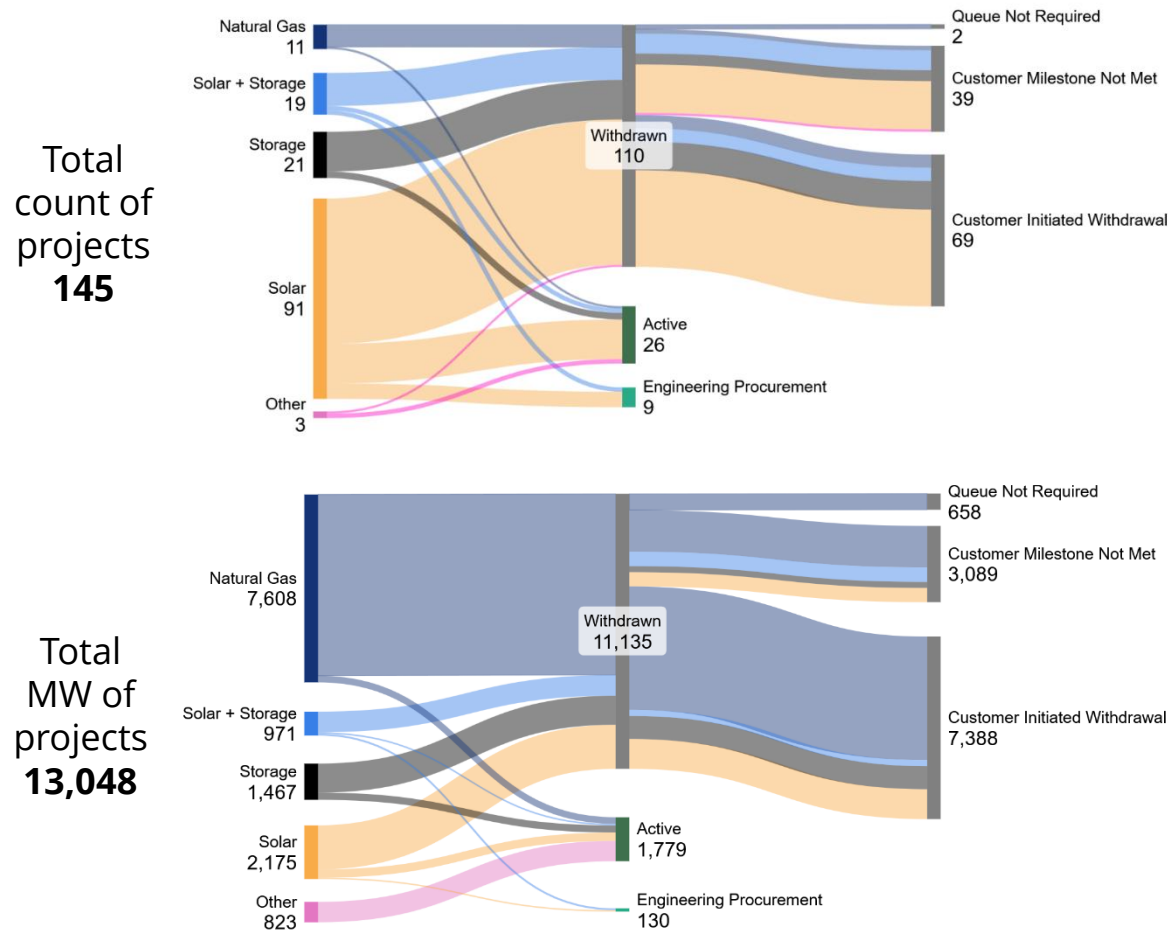
- Solar projects represent the largest number of withdrawn projects
- Pennsylvania energy projects have a higher withdrawal rate than projects across PJM as a whole

Most Pennsylvania-based energy projects that withdraw from the queue do so at or before Phase 1 of the interconnection process, suggesting that the underlying cause– such as siting issues– was present before queue entry

- If most PA projects exit at or before Phase I, then the queue is likely acting as an early screening mechanism for projects that have not yet secured a sufficiently developable site
- If projects were withdrawing at later queue stages, this could indicate loss of otherwise mature projects because of late-stage engineering problems – but this is not the case

PJM's queue reform will not be enough– siting reform is necessary to facilitate renewable development in Pennsylvania

Most Pennsylvania projects in the PJM queue since 2023 have withdrawn

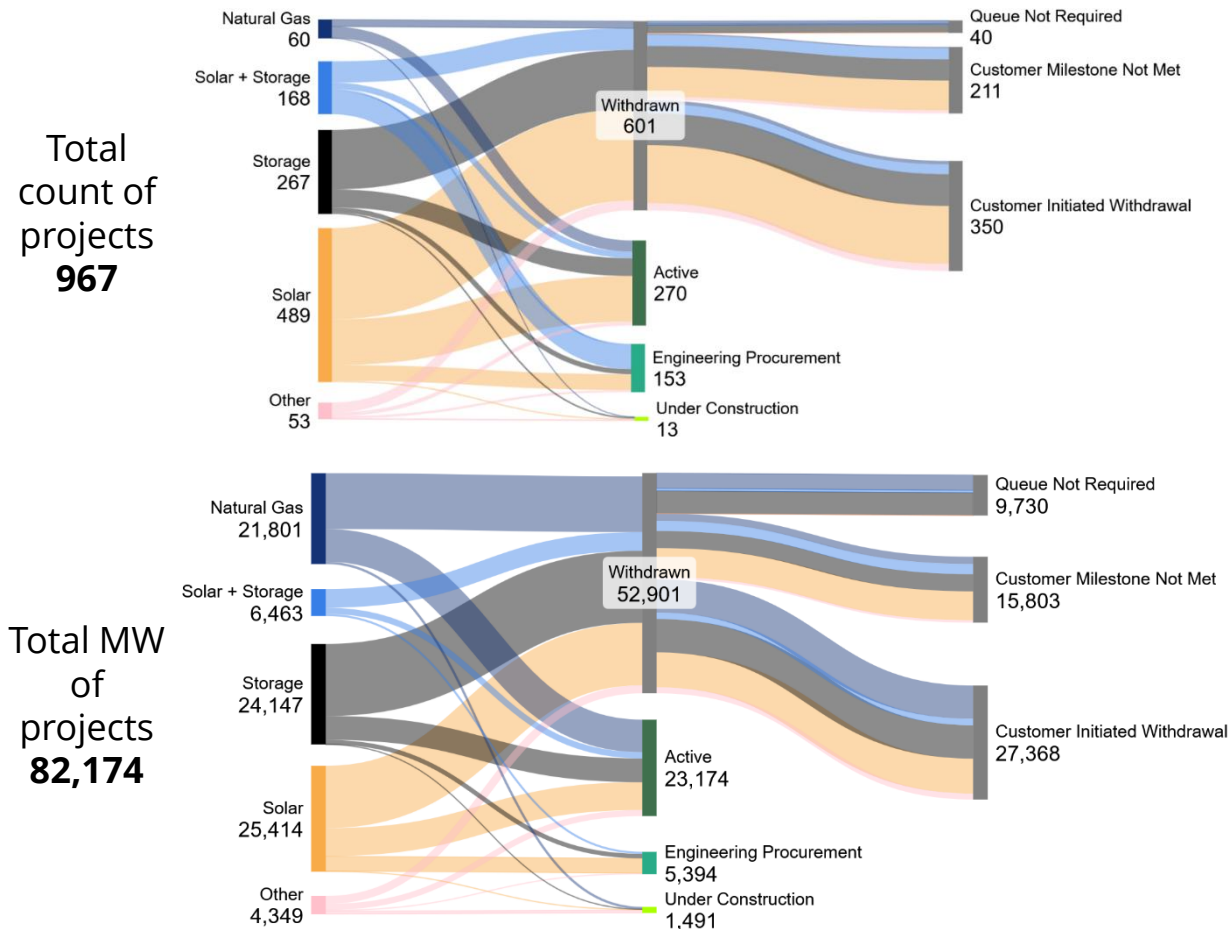


- Looking at PJM queue data since 2023,⁽¹⁾ we see that across resource types, the majority of Pennsylvania projects in the queue have withdrawn
- Solar projects represent the largest *number* of withdrawn projects (81, including hybrid)
 - Gas projects represent the largest *capacity* withdrawn from the queue (7 GW) due to the large size of each individual project
 - Our gas case studies show that gas projects did not withdraw from the queue due to siting issues
- Customer-initiated withdrawals are the main mode of attrition, indicating that problems outside of the queue process (like local ordinances, public opposition, permitting, and financing) are a bigger bottleneck than PJM process attrition alone

The “other” category includes hydro, wind, and nuclear, with one active 803 MW nuclear project representing the majority of the capacity in this category

(1) PJM. “Cycle Service Request Status”. Available at: <https://www.pjm.com/planning/m/cycle-service-request-status>

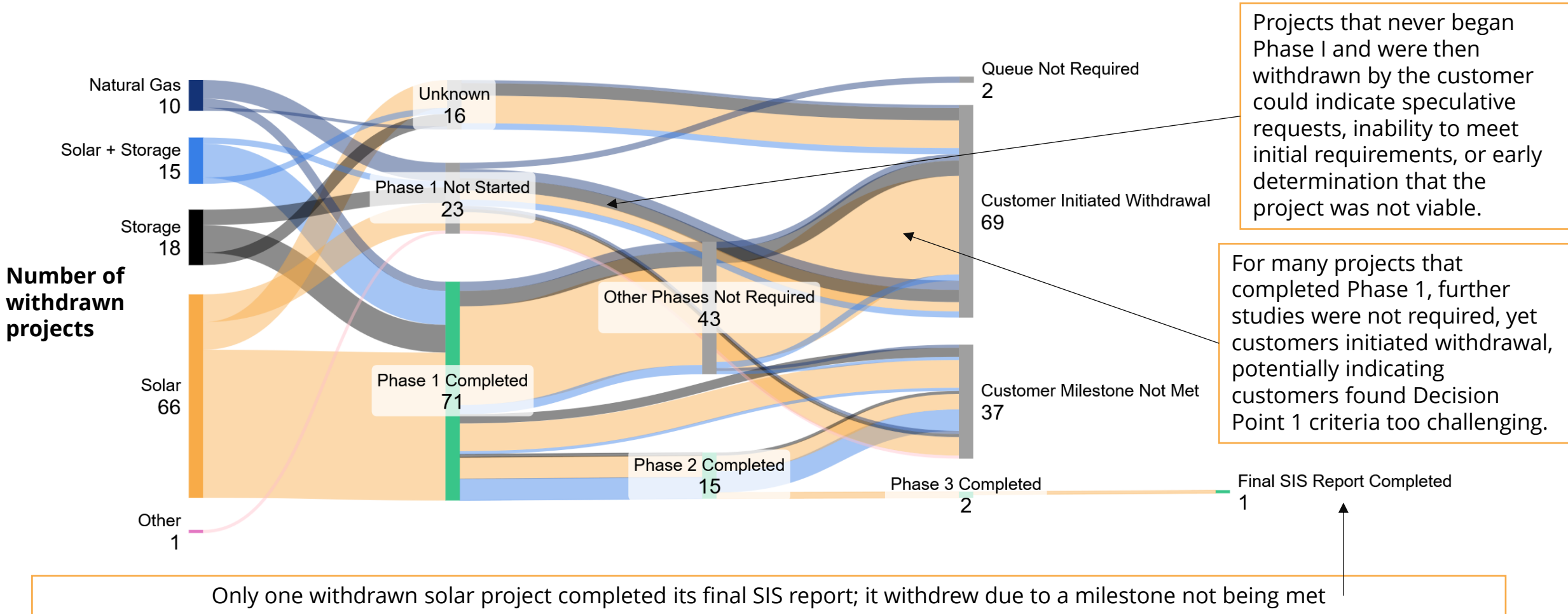
PJM-wide, projects reach active status at a higher rate than in Pennsylvania



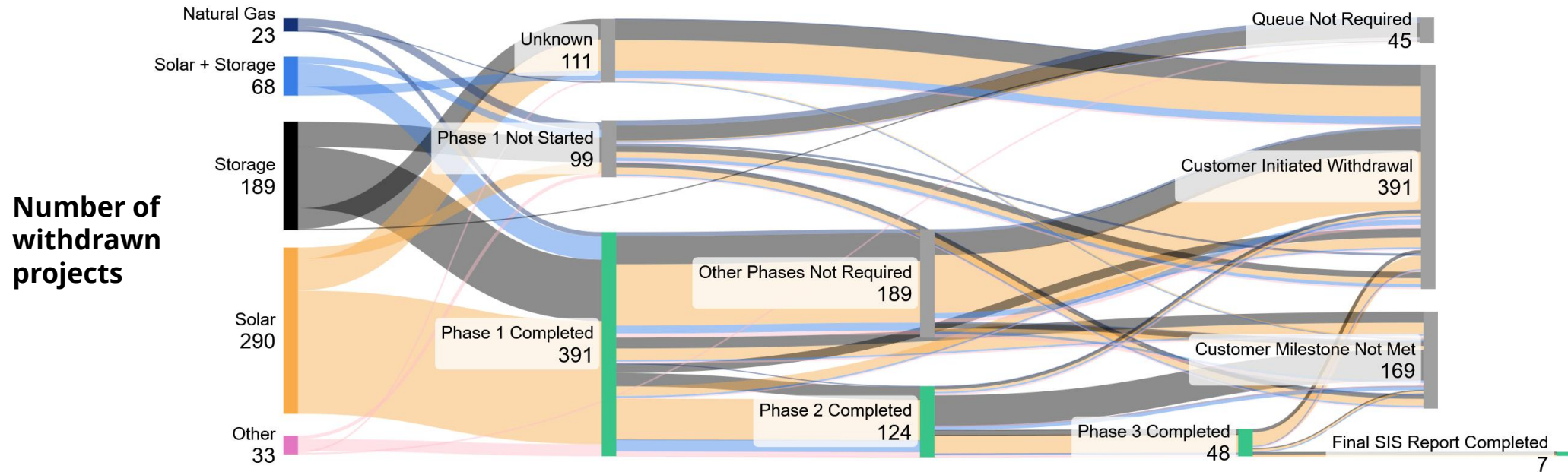
- Across PJM, more projects (38%) have reached the active stage or beyond relative to the current queue within Pennsylvania (24%)
- Pennsylvania renewable capacity had a higher share of customer-initiated withdrawal compared to PJM as a whole
 - Pennsylvania share of customer-initiated withdrawn RE capacity out of total withdrawn capacity: 62%
 - PJM: 49%
- At the PJM level, a number of storage projects withdrew because the queue was not required, potentially indicating projects that transitioned to behind-the-meter arrangements

Onshore and offshore wind projects make up the majority of projects and associated capacity in the "other" category across PJM

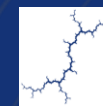
Most Pennsylvania queue projects end at or before Phase 1 of the interconnection process



Phase 1 of the interconnection process is also an attrition point at the PJM level



- Similar to within Pennsylvania, across PJM, there is large attrition of projects at or before Phase 1
- Out of over 600 withdrawn projects tracked in the PJM queue, only 48 made it to the Phase 3 study, and only 7 made it to the final report phase
- Resolving siting risks before the interconnection queue process could help to keep viable projects in the PJM queue, especially for solar projects



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Renewable Case Studies

Key Takeaways from Renewable Energy Case Studies

Challenge	Takeaway	Firefly	Electric City	Wilson
Community concerns. Community members are frequently concerned about the conversion of agricultural or residential-zoned land for renewable energy projects.	The siting and permitting process should sufficiently address local concerns through public engagement while ensuring opportunities for project development on private land.	✓	✓	✓
Restrictive ordinances. Land use ordinances can substantially restrict the amount and location of renewable development.	Reforms to the siting and permitting process can standardize land use criteria to improve outcomes and ensure a more predictable development environment.	✓		
Use of discretion interpreting ordinances. Local governments and zoning boards exercise considerable discretion during the siting and permitting process for renewable energy facilities.	Reforms to the siting and permitting process can ensure local decision-making is based on factual patterns and clear standards.		✓	✓
Court delays. Appealing local government decisions to the county court is a time-consuming and resource-intensive last resort.	Appeals, paired with inducements, can sometimes force the local government to the negotiating table, enabling the developer and local government to enter into a settlement.		✓	✓
Settlement uncertainty. Lack of predictability in the permitting process and discretionary decision-making can force developers to attempt other inducements, like settlements or community benefit agreements.	Inducements may be effective on a case-by-case basis, but developers should not rely on them for consistent permitting outcomes.	✓		✓

Firefly Solar cancelled when ordinance banned solar on ag land



Cancelled



Project basics: Firefly Solar was a proposed 200 MW solar project on agriculturally zoned land in North Beaver Township, Lawrence County in western PA. The developer, Vesper Energy, had estimated a commercial operation date of September 2026 but cancelled Firefly in December 2024.⁽¹⁾

Siting challenges:

- In 2021, the Township adopted an **ordinance restricting solar to industrially zoned areas**.⁽²⁾ The main complaint about the project was that it would **displace prime farmland**.
- Between 2021 and 2024, Vesper conducted community meetings and offered payment of \$250,000 per year for forty years to each of the Township, school district, and county in an unsuccessful effort to have the decision reversed.⁽³⁾ These payments would have been in addition to an estimated \$195,000 in annual county-level tax revenue.⁽⁴⁾

Relationship with legislation: The ordinance would not have been enforceable under the introduced legislation. HB 2651 would require municipalities to permit the development and construction of renewable energy facilities in areas zoned for agricultural use.

Development status: Advanced

- **Land leases:** The Township adopted the ordinance three years after Vesper began signing land leases with local farmers (2018)⁽³⁾
- **Interconnection:**
 - The Township adopted the ordinance a year after Vesper filed its interconnection request (March 2020)
 - Vesper withdrew the interconnection request in December 2024, after reaching the final stage of the interconnection process, Construction Service Agreement⁽⁵⁾

Takeaways: Earlier community research and alternate site selection might have helped. While the ordinance banning solar in agricultural districts cancelled the project, this project would have likely faced severe challenges regardless. Community concern about solar displacing prime farmland is prevalent in PA and community benefits payments do not always make a difference. Cancelling a project this late in development is very costly.

(1) Frank, Eugene. "Vesper's Firefly Solar Project Being Developed in Pennsylvania." *Construction Review Online*. October 22, 2025. Available at: <https://constructionreviewonline.com/200-mw-firefly-solar-project-to-be-developed-in-pennsylvania/>. (2) North Beaver Township Ordinance No. 21-1-4-1 of 2021. Available at: <https://www.attorneygeneral.gov/wp-content/uploads/North-Beaver-Township-Ordinance.pdf>. (3) Wachter, Debbie. "Solar Dilemma." *New Castle News Online*. 2023 series. Available at: https://www.ncnewsonline.com/news/local_news/solar-dilemma-solar-energy-on-farms-a-continuing-dilemma-in-county/article_f926edd2-35f9-11ee-abbf-13ec4fb48a17.html. (4) Strategic Economic Research. 2025. *Comparison of Property Tax Treatment for Solar and Battery Storage in Seven States*. Prepared for Clean Tomorrow. Available at: https://sitingsolutions.com/wp-content/uploads/2026/01/FINAL-Clean-Tomorrow_Property-Tax-Report.pdf (5) The data do not indicate whether the withdrawal was Customer Initiated or Milestone Not Met. Serial Service Request Status. Project ID AF2-322. PJM. Available at: <https://www.pjm.com/planning/service-requests/serial-service-request-status>.

Electric City Solar cancelled due to neighbor environmental concerns



Cancelled



Project basics: Electric City Solar was a proposed 4.35 MW solar project in Scranton, PA in Lackawanna County.⁽¹⁾ The developer, ECA, tried to secure a special exemption from the Scranton Zoning Hearing Board (ZHB) since part of the site is zoned residential but the ZHB rejected the request.

- **Coal history:** The site had formerly hosted coal mining.
- **Development status: Relatively advanced.** ECA bought the land in 2021. This project did not require an interconnection application with PJM due to its size.
- **Zoning application:** In February 2023, the ZHB held a hearing and heard input from neighbors about the project. Two residents, represented by Keyser Valley Citizens Association, shared fears that the project would **ruin the idyllic view of the forest** and **cause stormwater runoff**. The **ZHB rejected the special exemption** 4-1.
- **Escalation in the courts:** ECA appealed the decision with the county court, arguing that the rejection was “an abuse of discretion and contrary to law”.⁽²⁾ In April 2024, the attorney representing Electric City Solar discontinued the case.⁽³⁾

In PA, developers have to acknowledge the history with coal, oil, and gas. Communities are very concerned about water contamination.⁽⁴⁾

Subsequent project gained zoning approval: Interestingly, in 2025, Bear Peak Power applied successfully for a special exemption to zone a 2.5 MW project in another area zoned residential in Scranton. The site required extra environmental cleanup, which the developer offered to pay for. Neighbors criticized the new project at the zoning hearing, but they refused to communicate productively with the ZHB and the developer, so the ZHB approved the special exemption 3-2.^{(4), (5)}

Even though some ordinances do not comply with PA Municipalities Planning Code, filing an appeal with the county court happens only ten percent of the time; developers prefer to reach agreements with townships.⁽⁴⁾

Relationship with legislation: It is unclear whether the introduced legislation would have prevented the rejection. If HB 2651 had been in effect, the ZHB would have likely been limited to denying the application on the basis of setback distance or panel height, rather than other reasons the residents shared. Under the legislation, a municipality cannot impose restrictions more stringent than a height limit of 25 feet above the ground, or a setback distance greater than 150 feet from certain residential infrastructure.

Takeaways: Development needs to address neighbor concerns about site environmental safety to successfully make the case to a zoning board. Even when zoning boards “abuse discretion,” appealing to the county court is a last resort. It delays development, impacts project economics, and often is not worth the effort.

(1) Zoning Hearing Board, February 8, 2023. City of Scranton PA. Available at: <https://scrantonpa.gov/event/zoning-hearing-board-5/>. (2) Lockwood, Jim. "Solar company appeals zoning rejection of solar farm on West Mountain in Scranton." *The Times-Tribune*. March 20, 2023. Available at: <https://www.yahoo.com/news/solar-company-appeals-zoning-rejection-190800884.html>. (3) Phone conversation with Lackawanna County Clerk of Judicial Records, civil division, about docket 01051, August 26, 2026. (4) Developer interview, August 2026. However, the developer later cancelled this project for other reasons. (5) Lockwood, Jim. "Scranton zoners approve city's first solar farm," *The Times-Tribune*. April 1, 2025, Available at: <https://www.thetimes-tribune.com/2025/04/01/scranton-zoners-approve-citys-first-solar-farm/>.

Wilson Solar settled with township, downsizing and agreeing to payments



Smaller project
in development



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Project basics: Wilson Solar was a proposed 80 MW solar project in Venango Township in Erie County. The township's pre-existing ordinance permits solar as a conditional use in areas zoned agricultural and industrial.⁽¹⁾ The supervisors rejected Birch Creek Development's application for a permit, the developer appealed to the county court, the parties reached a settlement, and development has resumed.

- **Development status: Advanced.** Birch Creek submitted an interconnection request in 2019,⁽²⁾ and as of 2023, had negotiated leases or options with six farming landowners.⁽³⁾
- **Siting challenges:** In August 2023, the planning commission recommended the supervisors approve the developer's conditional use application, but in November, they changed their minds, saying the project didn't meet the criteria for conditional use. In January 2024, the **supervisors voted 3-0 to reject the application** in a crowded meeting that ended with applause from residents.
- **Resolution:** In February 2024, Birch Creek appealed the decision to the county court. They later settled with the township, which granted the permit so long as Birch Creek committed to conditions including a smaller project about ¼ of the original size.⁽⁴⁾

The ordinance was meant to help implement the land use goals in the comprehensive plan, including to **improve the aesthetics** of development, preserve a **healthful and pleasant residential environment**, and **protect farmland**. Planners found the project conflicted with these goals.⁽⁵⁾

Residents shared the project would **"destroy the character" of the rural neighborhood**. Residents also expressed concerns about **noise, fire risk, tree removal**, and more.⁽⁵⁾

Conditions include payments to the township general fund of \$250,000 in year 1 and an additional \$25,000 per year for the following 10 years.^{(6), (7)}

Relationship with legislation: The proposed legislation would have likely prevented the township from rejecting the application. Under HB 2651, reasons such as project size, aesthetics, or farmland preservation are not eligible grounds for rejection. The township could reject an application based on factors like noise, height, or setbacks, subject to caps that the proposed legislation establishes. However, based on the conditional use application, the project would have produced minimal noise and had a maximum height of 15 feet (more restrictive than the legislation's cap), so the township would not have been able to reject the project on that basis either.⁽⁵⁾ It is unclear whether the initial application's setbacks would have been within the legislation's 150-foot limit from certain residential infrastructure.

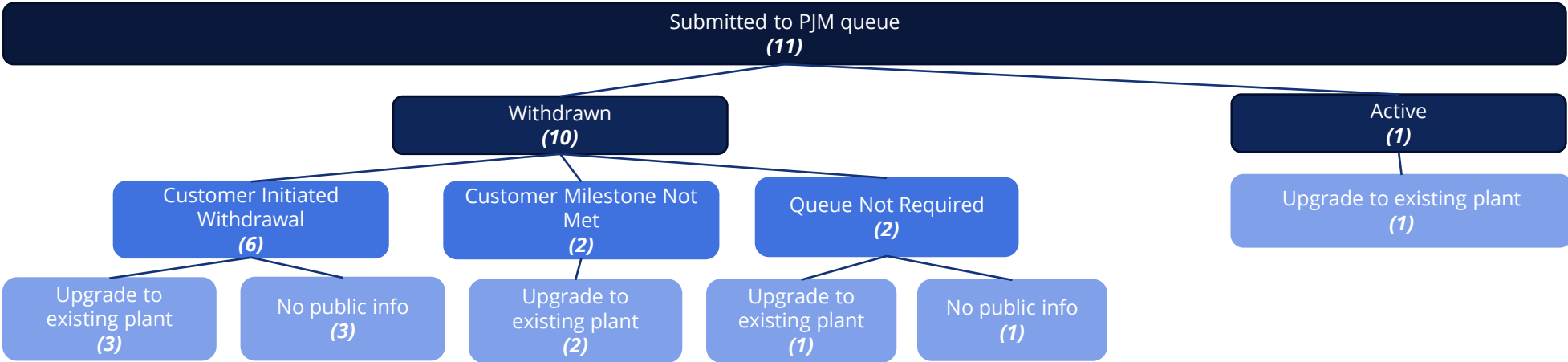
Takeaways: Adapting project to respond to community concerns can avoid a court battle and allow project to be developed via settlement at the township level.

(1) "Solar Ordinance." Venango Township. Available at: <https://venangotwp.com/2024/09/18/1151/>. (2) Serial Service Request Status. Project ID AF1-098. PJM. Available at: <https://www.pjm.com/planning/service-requests/serial-service-request-status>. (3) Myers, Valerie. "Giant solar farm is 'in the talking stages' for Erie County in Venango Township." Erie Times-News. September 5, 2023. Available at: <https://www.goerie.com/story/news/local/2023/09/05/solar-energy-farm-utility-scale-erie-county-pa-penelec-renewable-green-electricity-venango-township/70715841007/>. (4) Wilson Solar Conditions." 2025. Available at: <https://venangotwp.com/wp-content/uploads/2025/12/Wilson-Solar-Conditions.pdf>. (5) Myers, Valerie. "Venango supervisors give thumbs down to proposed solar farm." Erie Times-News. January 9, 2024. Available at: https://www.yahoo.com/news/venango-supervisors-thumbs-down-proposed-090628085.html?fr=sycsrp_catchall. (6) Myers, Valerie. "Solar farm construction near Wattsburg settlement agreement Wilson Solar." Erie Times-News. December 6, 2024. Available at: <https://www.goerie.com/story/news/local/2024/12/06/solar-farm-construction-near-wattsburg-settlement-agreement-wilson-solar-llc/76793749007/>. (7) "Wilson Solar Conditional Use Application and Rezoning Applications." 2024. Available at: <https://venangotwp.com/wp-content/uploads/2024/01/Wilson-Solar-Findings-w.letter-and-exhibits-FINAL-1.pdf>.

Gas Case Studies

Gas interconnection requests in PA are primarily upgrades to existing plants

PA gas generation interconnection requests submitted to PJM since 2023



- There have been recent calls for siting and permitting reform in Pennsylvania to unlock barriers to building renewable energy projects. These include Governor Shapiro’s “Lightning Plan”, which would establish the Reliable Energy Siting and Electric Transition (RESET) Board to centralize and streamline energy project development.⁽¹⁾
- Although initiatives like the RESET Board would be **technology-neutral**, they would in practice **primarily impact renewables**.
- Recent PJM interconnection requests for **gas generation** in Pennsylvania have mostly been **upgrades or conversions** at existing fossil plants, which would not be affected by potential statewide, technology-neutral siting legislation.
- The diagram above shows the **11 total gas generation interconnection requests** in Pennsylvania since 2023, of which **10 were withdrawn** and only one remains active.⁽²⁾
- This figure only includes projects requesting to interconnect into PJM. Behind-the-meter gas generation co-located with data centers is not captured in this analysis.

(1) “Governor Shapiro Unveils “Lightning Plan” to Strengthen Commonwealth’s Energy Leadership, Create Jobs, and Lower Costs for Consumers”. 2025. PA.gov. Available at: <https://www.pa.gov/governor/newsroom/2025-press-releases/governor-shapiro-unveils-lightning-plan-to-strengthen-commonwe> (2) PJM. “Cycle Service Request Status”. Available at: <https://www.pjm.com/planning/m/cycle-service-request-status>

Key Takeaways from Gas Case Studies

	Shippingport	Invitium	Lackawanna	Hummel	Hamilton Patriot	Hamilton Liberty	Hunterstown	Invenergy	Armstrong
Takeaway									
Siting legislation would not impact coal-to-gas conversion projects.	✓								
Siting legislation would not impact upgrade projects at existing plants.			✓	✓	✓	✓	✓		✓
Developers often submit interconnection requests for projects that do not materialize.		✓							
Behind-the-meter gas generation serving data centers does not need to apply for PJM interconnection.								✓	

Shippingport Power Station (1,700 MW, Beaver County)

Siting legislation would not impact coal-to-gas conversion projects



This application likely represents an early interconnection request for the **coal-to-gas conversion** of the Bruce Mansfield coal plant, which retired in 2019. Frontier Group of Companies is developing the project, now planned at 2,550 MW of capacity. Since the project appears to be proceeding, the developer will likely need to submit a new interconnection request. Frontier Group has partnered with Aligned Data Centers– the plant is expected to serve a co-located data center and provide over 1 GW of excess capacity to PJM.

PJM Queue Status

- **Status: Withdrawn – Customer Milestone Not Met**
- Project ID: AH1-674
- Part of PJM’s Reliability Resource Initiative, a one-time opportunity for shovel-ready resources that can contribute to PJM’s reliability needs

Siting Status

- Since this is a coal-to-gas conversion, it would use the existing site. Therefore, the proposed siting legislation would not impact this project.

Permitting Status

- The project website states that the developer planned to submit an air permit in 2025, but there are no records of this in the PA DEP eFACTS database
- The project website also states that site-related environmental liabilities have been remediated

(1) Frontier Group of Companies. “Shippingport Industrial Park”. Available at: <https://frontier-companies.com/shippingport-industrial-park/> (2) Frontier Group of Companies. 2025. “Bruce Mansfield Conversion Announcement”. Available at: <https://frontier-companies.com/the-frontier-group-of-companies-to-transform-bruce-mansfield-power-plant-into-state-of-the-art-natural-gas-power-plant-supporting-americas-energy-goals-and-pennsylvanias-economic-gr/>

Invitium Energy Applications (1,450 MW to 2,175 MW, Columbia County)

Developers often submit interconnection requests for projects that do not materialize



Invitium Energy filed three applications in Columbia County, likely for the same project. They were all submitted and withdrawn on the same dates, and were withdrawn at too early a stage for any public information to become available. Developers often submit multiple interconnection requests for a single project as an exploratory mechanism to gain information and compare interconnection points.

PJM Queue Status

- **Status: Withdrawn – Customer Initiated Withdrawal**
- Project IDs: AH1-675, AH1-688, AH1-689
- Reliability Resource Initiative project

Siting Status

- Likely too early-stage for siting details to be available

Permitting Status

- None found

Lackawanna Energy Center (39 MW, Lackawanna County)

Siting legislation would not impact upgrade projects at existing plants



This application was for an **upgrade** to the Lackawanna Energy Center, a 1,485 MW gas plant that is currently the fourth-largest polluter in Pennsylvania. Notably, Sunnyside Road Associates has proposed a 487,000-square-foot data center in the parcel adjacent to this plant. The data center received conditional approval from the borough council for its preliminary land development plan. However, Sunnyside Road Associates has filed a land-use appeal against the Jessup Zoning Hearing Board after it denied the project a height variance.

PJM Queue Status

- **Status: Withdrawn – Customer Initiated Withdrawal**
- Project ID: AH1-697
- Withdrawn in Phase 1

Siting Status

- Site of the existing Lackawanna Energy Center, which faced siting opposition from a local community group (Citizens for a Healthy Jessup)
- An upgrade would not require additional siting, so the proposed siting legislation would not affect this project

Permitting Status

- None found – the last air quality permit for Lackawanna was issued by PA DEP in December 2023

(1) The Center for Public Integrity. 2017. "Big power plant ignites political fight in small Pennsylvania town". Available at: <https://publicintegrity.org/environment/big-power-plant-ignites-political-fight-in-small-pennsylvania-town/?fbclid=IwAR20gOdTcFzzy00aCr27RC-mvk2m0XySX8gZkE8Y2ZaBCHygYIAkaRNH00>. (2) Penn Environment. 2023. "Pennsylvania's Dirty Dozen". Available at: <https://environmentamerica.org/pennsylvania/center/resources/pennsylvanias-dirty-dozen/>. (3) Lesnfsky, Frank. 2026. "Councilman: No reason to panic as Jessup OKs preliminary data center plans". *The Times-Tribune*. June 4. Available at: <https://www.thetimes-tribune.com/2026/06/04/councilman-no-reason-to-panic-as-jessup-oks-preliminary-data-center-plans/>. (4) Lesnfsky, Frank. 2026. "Developer sues PA town after it denies data center plans". *PennLive*. July 14. Available at: <https://www.pennlive.com/news/2026/07/developer-sues-pa-town-after-it-denies-data-center-plans.html>. (5) PA DEP. "Facility ID 776907". *eFACTS*. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleFacility.aspx?FacilityID=776907.

Hummel Station (32 MW, Snyder County)

Siting legislation would not impact upgrade projects at existing plants

This application was for a planned **upgrade** to the existing Hummel Station. In February 2026, the PA DEP approved the installation of hardware efficiency improvements to the facility's three combustion turbines, which would increase power output by about 32 MW. According to Capital Power's website, the developer anticipates completing the work in 2027. LS Power originally proposed the capacity uprate as part of PJM's Reliability Resource Initiative in March 2025, then sold the plant to Capital Power in June 2025. The project was withdrawn from the queue in December 2025. Capital Power has marketed Hummel's role in attracting large-scale data centers, but no public plans exist for a co-located data center.

PJM Queue Status

- **Status: Withdrawn – Customer Milestone Not Met**
- Project ID: AH1-705
- Withdrawn at Decision Point 1

Siting Status

- Since this is an upgrade, it would use the existing site. The proposed siting legislation would not affect this project.

Permitting Status

- *Major Facility Plan Approval New Source Performance Standard* permit issued by PA DEP in February 2026

(1) Capital Power. "Hummel Station". Available at: <https://www.capitalpower.com/operations/hummel-station/> (2) LS Power. 2025. "Announcement of Sale of Hummel and Rolling Hills to Capital Power". Available at: <https://www.lspower.com/news/ls-power-announces-sale-of-hummel-and-rolling-hills-projects-to-capital-power/> (3) Capital Power. 2026. "Energizing Prosperity in Pennsylvania". Available at: <https://www.capitalpower.com/energizing-prosperity-in-pennsylvania/> (4) LS Power. 2025. "LS Power Submits Proposal to Add New Generation Supply Across PJM". Available at: <https://www.lspower.com/news/ls-power-submits-proposal-to-add-new-generation-supply-across-pjm/> (5) Ulrich, Steve. 2025. "Capital Power Commits \$4B to Pennsylvania Energy Development in Shamokin Dam". PoliticsPA. July 15. Available at: <https://politicspa.com/capital-power-commits-4b-to-pennsylvania-energy-development-in-shamokin-dam/142104/> (6) PA DEP. "Authorization ID 1526448". eFACTS. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleAuth.aspx?AuthID=1526448

Hamilton Patriot (30 MW capacity-only, Lycoming County)

Siting legislation would not impact upgrade projects at existing plants



This application was for an **upgrade** at the existing Hamilton Patriot Generation Plant (formerly Panda Patriot). Cogentrix, which has a long-term service agreement with Siemens Energy, announced plans for a rotor exchange and upgrade in 2025 or 2026. Cogentrix previously completed a rotor upgrade at the plant in 2021 that yielded a 30-MW increase in unit output and is now planning another upgrade of the same scale.

PJM Queue Status

- **Status: Withdrawn – Customer Initiated Withdrawal**
- Project ID: AH1-707
- Withdrawn at Decision Point 1

Siting Status

- Since this is an upgrade, it would use the existing site. The proposed siting legislation would not affect this project.

Permitting Status

- *Major Facility Plan Approval New Source Performance Standard* permit issued by PA DEP in March 2026

(1) Global Energy Monitor. "Panda Patriot Generation Plant". Available at: https://www.gem.wiki/Panda_Patriot_Generation_Plant (2) "Optimizing Combined-Cycle Power Plant Operations". 2023. *PowerMag*. April 3. Available at: <https://www.powermag.com/optimizing-combined-cycle-power-plant-operations/> (3) "Cogentrix Comments to the Pennsylvania PUC En Banc Hearing on Interconnection and Tariffs for Large Load Customers". PA PUC Docket No. M-2025-3054271. Available at: <https://www.puc.pa.gov/pdocs/1882161.pdf> (4) PA DEP. "Authorization ID 1444463". *eFACTS*. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleAuth.aspx?AuthID=1444463

Hamilton Liberty (60 MW capacity-only, Bradford County)

Siting legislation would not impact upgrade projects at existing plants



This application was for an **upgrade** at the existing Hamilton Liberty Generation Plant (formerly Panda Liberty). Cogentrix, which has a long-term service agreement with Siemens Energy, announced plans for a rotor exchange and upgrade in 2025 or 2026 that would increase unit output by 60 MW.

PJM Queue Status

- **Status: Withdrawn – Customer Initiated Withdrawal**
- Project ID: AH1-720
- Withdrawn at Decision Point 1

Siting Status

- Since this is an upgrade, it would use the existing site. Therefore, proposed siting legislation would not impact this project.

Permitting Status

- *Major Facility Plan Approval New Source Performance Standard* permit issued by PA DEP in April 2026

(1) Global Energy Monitor. “Panda Liberty Generation Plant”. Available at: https://www.gem.wiki/Panda_Liberty_Generation_Plant (2) “Optimizing Combined-Cycle Power Plant Operations”. 2023. *PowerMag*. April 3. Available at: <https://www.powermag.com/optimizing-combined-cycle-power-plant-operations/> (3) “Cogentrix Comments to the Pennsylvania PUC En Banc Hearing on Interconnection and Tariffs for Large Load Customers”. PA PUC Docket No. M-2025-3054271. Available at: <https://www.puc.pa.gov/pdocs/1882161.pdf> (4) PA DEP. “Authorization ID 1566111”. eFACTS. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleAuth.aspx?AuthID=1566111

Hunterstown Generation (20 MW, Adams County)

Siting legislation would not impact upgrade projects at existing plants



This application represents an **upgrade** at the existing Hunterstown Generation plant. LS Power announced its proposal for this capacity uprate as part of PJM's Reliability Resource Initiative in March 2025, before withdrawing from the queue in May 2025.

PJM Queue Status

- **Status: Withdrawn – Queue Not Required**
- Project ID: AH1-708
- Reliability Resource Initiative project

Siting Status

- An upgrade would not require additional siting, so the proposed siting legislation would not affect this project.

Permitting Status

- None found – the last air quality permit for Hunterstown was a renewal issued by PA DEP in January 2026

(1) Global Energy Monitor. "Hunterstown Power Plant". Available at: https://www.gem.wiki/Hunterstown_power_plant (2) LS Power. 2025. "LS Power Submits Proposal to Add New Generation Supply Across PJM". Available at: <https://www.lspower.com/news/ls-power-submits-proposal-to-add-new-generation-supply-across-pjm/> (3) PA DEP. "Facility ID 651965". eFACTS. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleFacility.aspx?FacilityID=651965

Invenergy Susquehanna-Mountain application (638 MW, Luzerne County)

Behind-the-meter gas generation serving data centers does not need to apply for PJM interconnection



There is little public information about this project. It may have been proposed to meet demand from planned expansions of the AWS data center connected to Susquehanna nuclear station. Based on its withdrawal from the PJM queue, it is possible that the project will materialize as behind-the-meter generation for the data center.

PJM Queue Status

- **Status: Withdrawn – Queue Not Required**
- Project ID: AH1-733
- Reliability Resource Initiative project

Siting Status

- This project would likely be co-located with a planned data center.

Permitting Status

- None found

(1) CleanView. "AWS Susquehanna - Building 15". Available at: <https://cleanview.co/data-centers/pennsylvania/3430/aws-susquehanna---building-15>

Armstrong Power (270 MW, Indiana County)

Siting legislation would not impact upgrade projects at existing plants



This application is for the conversion of Armstrong Power from a gas peaker to a baseload plant through the addition of a steam cycle. The upgrade would enable the plant to operate at a higher capacity factor to help meet reliability needs in PJM. NRG Energy acquired the plant from LS Power in January 2026. The project remains active in the PJM queue and appears to be in the pre-construction phase.

PJM Queue Status

- **Status: Active – Phase 2**
- Project ID: AH1-734
- Reliability Resource Initiative project
- PJM Phase II System Impact Study Report was released in June 2026

Siting Status

- Since this is an upgrade, it would use the existing site. The proposed siting legislation would not affect this project.

Permitting Status

- Extension of *Major Facility Plan Approval New Source Performance Standard* permit issued by PA DEP in June 2026
- The permit was originally issued in June 2020, then was extended several times. There are several potential reasons for this, including construction delays or supply chain issues that may have caused the permit's validity window to expire.

(1) Global Energy Monitor. "Armstrong Gas Power Station". Available at: https://www.gem.wiki/Armstrong_Gas_power_station (2) LS Power. 2025. "LS Power Submits Proposal to Add New Generation Supply Across PJM". Available at: <https://www.lspower.com/news/ls-power-submits-proposal-to-add-new-generation-supply-across-pjm/> (3) PA DEP. "Authorization ID 1528971". eFACTS. Available at: https://www.ahs.dep.pa.gov/eFACTSWeb/searchResults_singleAuth.aspx?AuthID=1528971

Tracking siting and permitting data for renewable and fossil generation projects in Pennsylvania presents several challenges

- Interconnection requests can be tracked through the PJM queue, but developers typically file under project-specific LLCs, leaving little public information available to identify the underlying project.
- For projects that withdraw from the queue, there is little information available about why and whether they are still advancing.
- Pennsylvania lacks a centralized siting authority, which would likely maintain a searchable database of project applications. Instead, siting decisions are made at the local municipal and county level, leaving project information scattered across jurisdictions.
- The PA DEP eFACTS database is difficult to cross-reference with PJM queue project identifiers, does not classify facilities by type, and is not reliably compatible with web browsers.

Making this information more accessible would benefit both policymakers and developers, enabling better analysis of project statuses and reasons for withdrawal as well as more effective policy development.

Legislation Analysis

Potential impact of introduced legislation on solar ordinances in PA

- **Introduced legislation (HB 2651) in Pennsylvania proposes to create a statewide, standardized permitting and zoning framework for energy facilities**

- We focused on Section 605-A: Siting standards for renewable energy facilities, and compared these to current solar ordinances in Pennsylvania counties and jurisdictions
- Our previous analysis showed siting has been less of an issue for natural gas given that most recent projects were upgrades
- Our queue data analysis indicated that solar projects represent the majority of withdrawn projects

- **We surveyed NLR⁽¹⁾ and Penn State⁽²⁾ databases on provisions relating to utility-scale solar development in county and local laws and ordinances.**

- County-level – 213 provisions in solar ordinances in 10 out of 67 counties
- Local-level – 1,742 provisions in solar ordinances in 198 out of 2,559 townships, boroughs, and cities

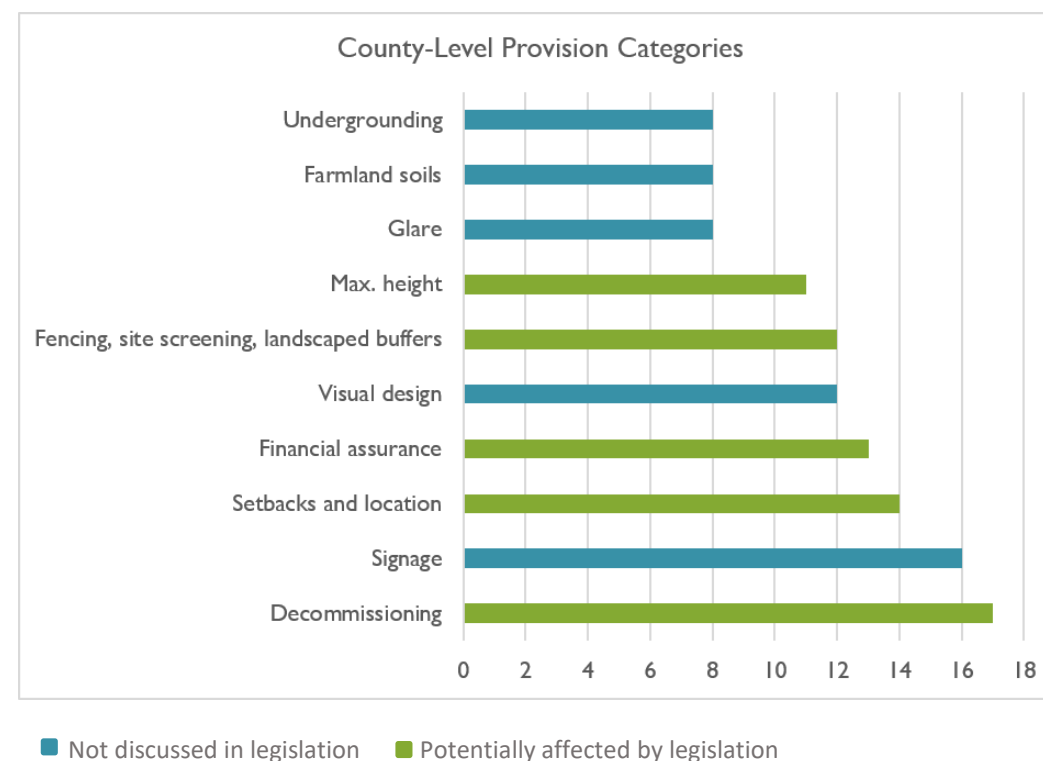
Rather than comparing individual provisions to bill language, we organized provisions into categories and compared these categories to the scope of the introduced legislation to understand which categories (and associated provisions) *could* be streamlined by the bill

(1) U.S. DOE, "U.S. Solar Siting Regulation and Zoning Ordinances (2025)". Updated Feb 2026. Available at: <https://data.openei.org/submissions/8602> (2) Penn State Center for Energy Law and Policy. "Pennsylvania Solar Ordinances Database." June 2026. Available at: <https://celp.psu.edu/pa-solar-ordinances/>

90 county-level solar provisions could be streamlined by the introduced legislation

- We analyzed the **10 counties in Pennsylvania with county-level solar ordinances** (Adams, Butler, Clarion, Forest, Fayette, Luzerne, Lycoming, Montour, Northumberland, and Tioga)
- We grouped provisions in these ordinances into **40 categories**, starting with category definitions from Penn State's solar ordinances database
- We identified **90 provisions in categories** that could be superseded by the proposed legislation, and **123 provisions in categories** that the legislation does not specifically discuss
- "Decommissioning" was the category with the most existing provisions
 - The introduced legislation requires decommissioning plans for solar energy facilities, while many jurisdictions require that decommissioning happen within a certain amount of time, meet specific site restoration requirements, or other more specific requirements
 - Unclear how the introduced legislation would interact with existing decommissioning requirements

Top 10 provision types and effect of proposed legislation



Example Provision Category: Height

The introduced legislation's height maximum would supersede county-level restrictions on height



Selected Provisions

- Montour County: "All ground mounted solar panels shall comply with a maximum **fifteen (15) foot** height requirement."⁽¹⁾
 - SEF = solar energy facility
- Adams County: "Ground mounted solar panels shall not exceed a height of **ten (10) feet.**" ⁽³⁾
- Butler County: "Ground mounted PSES shall not exceed **twenty (20) feet** in height."⁽⁴⁾
 - PSES = principal solar energy system

Introduced Legislation

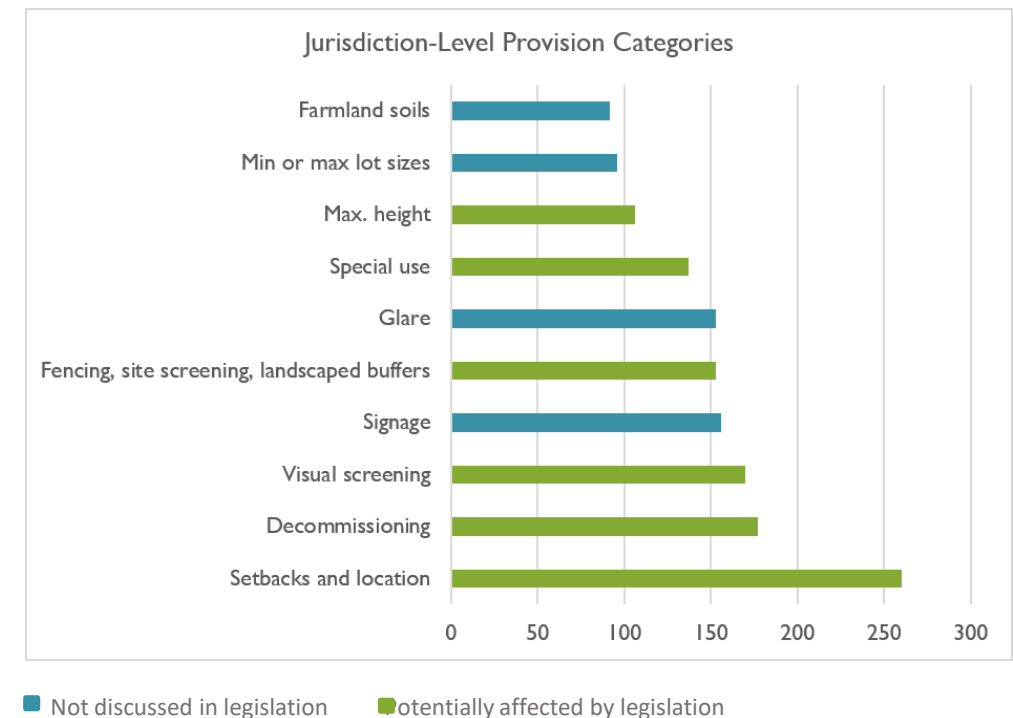
- "(a) Maximum standards.--A zoning ordinance may include provisions regulating setback distances and heights of renewable energy facilities if the provisions do not exceed the following standards: ..."
- "(1) A solar energy facility shall comply with the following: ... (v) The height of a solar panel may not exceed **25 feet** above ground when the solar energy facility's arrays are at full tilt." ⁽²⁾

(1) Montour County, "An ordinance of the Board of Commissioners of Montour County, Pennsylvania, amending the zoning ordinance of Montour County to set forth requirements for solar energy systems." 2021. Available at: <https://www.montourcounty.gov/getmedia/be5b9cf0-6614-4469-a831-eae0b2ee256f/1-of-2021-Solar-Development.pdf> (2) Pennsylvania General Assembly, "Bill Information: HB2651." 2026. Available at: <https://www.palegis.us/legislation/bills/2025/hb2651> (3) Adams County, "Adams County Zoning Ordinance," amended 2022. Available at: https://adamscountypa.gov/getmedia/94480be0-f30b-4e7b-9c8f-6dd21e1c8190/Adams_County_Zoning_Ordinance.pdf (4) Butler County, "Subdivision and Land Development Ordinance," amended 2024. Available at: <https://www.butlercountypa.gov/DocumentCenter/View/6386/Butler-County-Subdivision-and-Land-Development-Ordinance-4242024?bidId=>

821 jurisdiction-level solar provisions could be streamlined by the introduced legislation

- We analyzed the **198 jurisdictions in Pennsylvania with solar ordinances**
- We identified **821 provision types** that could be superseded by the proposed legislation, and **918 provision types** that the legislation does not specifically discuss
- **“Setbacks and location” was the category with the most existing provisions**
 - This category encompasses setbacks from structures, property lines, conservation lands, roads, etc., as well as restrictions on siting in certain zoning districts
 - Reducing setback distances to the uniform level in the introduced legislation can make more land area available for solar development
 - The introduced legislation states that jurisdictions “shall permit the development and construction of a renewable energy facility by right, special exception or conditional use in an area zoned for agricultural or industrial use,” which would supersede any restrictions on siting in those zones

Top 10 provision types and effect of proposed legislation



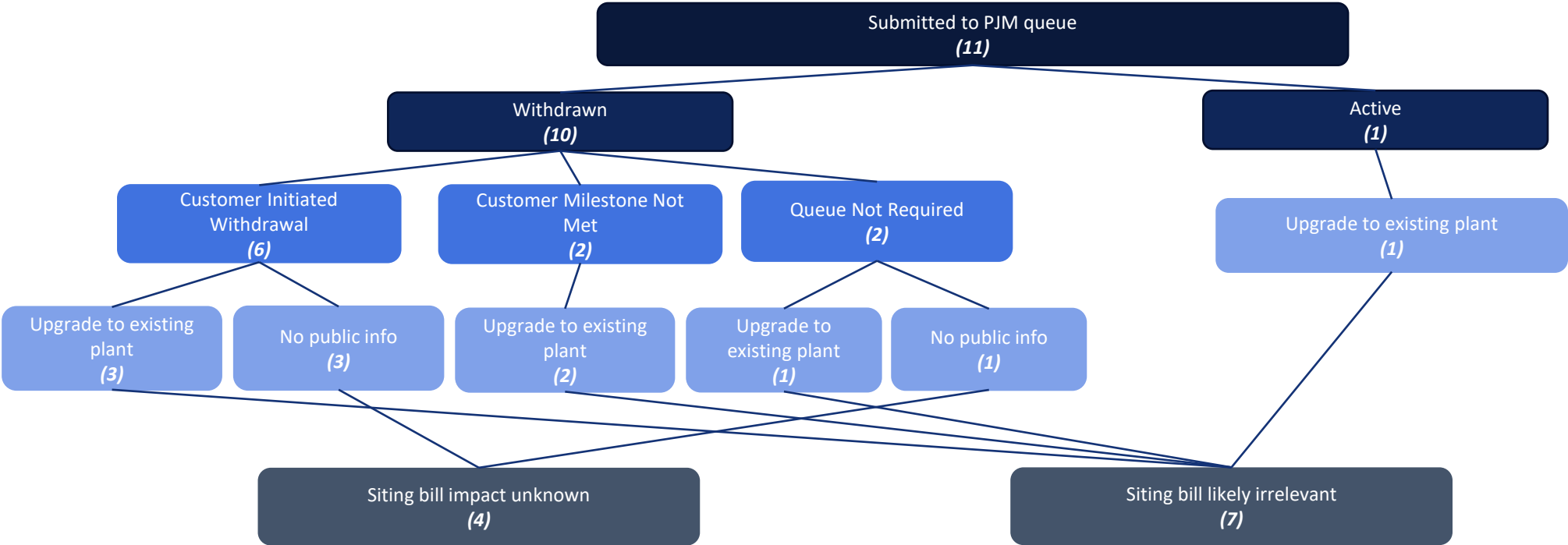
Deep Dive: Jackson Township, Lebanon County

- Jackson is one of two townships in Pennsylvania with the greatest number of restrictive solar provisions
- Within Jackson’s solar ordinance, we identified:
 - **Two** provisions that would clearly be streamlined by the introduced legislation
 - **Three** provisions in categories discussed in the legislation but without clear effect
 - **Four** provisions not mentioned in the legislation
 - **One** provision at the same level of stringency as the legislation

Provision Type	Description	Potential Effect of Introduced Legislation
Setbacks	SEFs must be set back 350 feet from the property line of residential/public-use property, or a 100-foot setback for other properties; plus resource-specific setbacks (e.g. water, conservation lands)	Legislation setback distances are shorter for unoccupied properties and public areas; could ease development
Maximum height	Ground-mounted solar panels are limited to 15 feet in height, while other components generally follow the underlying district height limits	Height maximum is 25 feet; could ease development
Minimum lot size	Ground-mounted SEFs require a minimum parcel size of 30 acres	Not discussed in legislation
De-commissioning	Developers must decommission a facility within 12 months of ceasing commercial generation, restore the site, and maintain financial security	Requires decommissioning plan and proof of financial assurance; unclear how this would interact with existing provision
Glare	Applicants must submit and fund a study on reflected light effects and provide mitigation if needed	Not discussed in legislation
Fencing	SEFs must be enclosed by an eight-foot fence with various specifications on security and safety	Not discussed in legislation for solar
Signage	SEFs must post at least one security-fence sign with various safety and other information	Not discussed in legislation
Screening	SEFs generally require dense evergreen screening around the full perimeter	Legislation allows municipalities to require vegetative screening, though they must consider “feasibility”, “industry standards”, and “best practices for SEFs”; effect unclear
Farmland soils	SEFs may use Class I-III agricultural soils for no more than 50% of the development area, or 75% for agrivoltaics, and must meet access-road, erosion-control, stormwater, vegetation, and restoration requirements	Legislation allows municipalities to require SEF owners/operators to “maintain topsoil”; effect unclear
Special use districts	Large ground-mounted SEFs are allowed only by special exception in Agricultural and Industrial districts	Legislation directs municipalities to permit SEFs in agricultural and industrial zones by right, special exception, or conditional use; no change

Unlike with solar, siting legislation would not affect recently proposed gas projects

PA gas generation interconnection requests submitted to PJM since 2023⁽¹⁾, with siting bill impacts



Even if HB 2651 were technology-neutral, it would be irrelevant to all the Pennsylvania gas projects that have entered the interconnection queue since 2023 and for which we have sufficient information

(1) PJM. "Cycle Service Request Status". Available at: <https://www.pjm.com/planning/m/cycle-service-request-status>

Siting legislation’s impact on recent energy projects would have varied by type

Natural gas	Solar, solar + storage	Storage	Wind
Minimal impact	Large positive impact	Minimal impact	Moderate positive impact
None of the gas projects that entered the queue since 2023 have required siting approval, as they have been upgrades at existing sites (based on available data).	Many solar projects have been cancelled at early stages due to county or local ordinances, or withdrawn during early interconnection queue phases. There is substantial overlap between the introduced siting legislation and the categories addressed by county and local-level solar ordinances.	Very few storage-related ordinances currently exist.	226 jurisdictions in Pennsylvania have restrictive wind-related ordinances ⁽¹⁾ – however, there is only one Pennsylvania-based wind project currently in the PJM queue.

(1) NLR. 2025. “U.S. Wind Siting Regulation and Zoning Ordinances.” Available at: <https://data.openei.org/submissions/8519>

Summary

Pennsylvania's current siting ordinances restrict solar, not gas



- Customer-initiated withdrawal is the main mode of attrition for Pennsylvania-based energy projects in the PJM queue, likely reflecting problems outside the queue process itself (like local ordinances and public opposition) and/or challenges identified in the first phase of queue requirements.
- Community concerns, restrictive ordinances and discretionary interpretation of these ordinances, court delays, and settlement uncertainty have created barriers for proposed solar, wind, and battery energy storage projects in Pennsylvania. Seventy-five percent of Pennsylvania-based renewable projects that entered the PJM queue since 2023 have withdrawn, representing 82 percent of renewable capacity that entered the queue over that period.
- Meanwhile, all 11 Pennsylvania-based gas plant interconnection requests since 2023 (totaling about 8 GW) involve upgrades at existing plants that do not require additional siting approval, or lack sufficient information to determine otherwise.
- The siting bill introduced in the Pennsylvania legislature (HB 2651) could streamline over 900 provisions for solar energy facilities across counties and jurisdictions, superseding specific restrictions in 10 counties and 198 jurisdictions while also reducing overall burdens.
- Even **if the siting legislation were technology-neutral, its provisions still would not have impacted any of Pennsylvania's recent gas interconnection requests** (at least those for which we had sufficient information), since they were all sited at existing plants rather than new sites.
 - For example, the RESET Board bill (HB 502), though technology-neutral, would not have facilitated any of the gas projects we examined.

Siting reform is key to unlocking renewable development in Pennsylvania

Revisiting our research questions:

Is electricity generation development particularly challenging in Pennsylvania?

- Yes – Pennsylvania’s lack of a centralized siting authority creates a fragmented, unpredictable development process, with projects subject to inconsistent review across the state’s over 2,500 municipalities.

To what extent is the interconnection queue the bottleneck compared to local siting and permitting?

- The queue process does not appear to be a major driver of project failure. Although Pennsylvania has above-average withdrawal rates from the PJM queue, most of these withdrawals occur in the early stages of the process and are likely driven by external factors such as siting.

Would the proposed siting legislation make it easier to build resources, and would it have a differentiated impact on solar versus gas?

- Siting is a major obstacle for renewable development in Pennsylvania. The proposed legislation would streamline 90 county-level and 821 jurisdiction-level provisions for solar facilities.
- Had the legislation been technology-neutral and in effect since 2023, it would not have affected any of Pennsylvania’s gas interconnection requests, since none required siting approval.