



BEFORE THE PJM INTERCONNECTION, L.L.C.

Powering Reliability Through Market Design Workshop

Response to August 4, 2026 Request for Papers

Submitted to:

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PJM Interconnection, L.L.C.

Date: August 31, 2026

Re: Stakeholder Paper on Priority Near-Term Reforms to Manual 19 to Enable Residential Customers with Eligible Technologies, Especially Those with Injection Capability, to Provide Verifiable System Benefits Under Any Market Design Pathway

I. INTRODUCTION AND SUMMARY OF POSITION

Pursuant to the August 4, 2026 Request for Papers issued by PJM Interconnection, L.L.C. (“PJM”) in connection with the Powering Reliability Through Market Design effort, Tesla, Inc. respectfully submits this paper addressing the seven questions set forth therein.¹

We are carefully evaluating the options presented in PJM’s May 6, 2026 white paper, *Powering Reliability Through Market Design: Addressing Rising Demand and Constrained Supply, and Stimulating Investment To Support Durable Reliability* (the “White Paper”), including Paths A, B, and C and possible hybrid approaches.² We are developing our position on the longer-term market design direction and look forward to engaging constructively with PJM, the states, fellow stakeholders, and the Board as the process moves forward.

Regardless of which path or combination of elements ultimately advances, PJM should adopt market reforms that remove remaining barriers to both supply-side and demand-side participation for DER aggregations. These comments focus on reforms to help create a clear, administrable pathway for state-level demand reduction programs that dispatch battery aggregations to produce verifiable zonal reductions in capacity purchase obligations. Aligning PJM’s capacity construct with these state programs would improve the accuracy of zonal reliability signals, allow aggregators to stack wholesale and retail value streams in a non-duplicative manner, and ensure that the growing fleet of residential batteries can contribute to resource adequacy.

In order to help unblock that available capacity, the following near-term actions are essential and urgent under any market reform pathway: immediate implementation under existing authority of Manual 19 Attachment B mirrored demand-side reductions, together with expedited modernization of Attachment D. These reforms are necessary so that verified peak-reducing resources and programs, particularly those serving residential and small commercial customers

with eligible technologies, and especially resources with injection capability, can be accurately reflected as downward adjustments to the load forecast and Reliability Requirement. Doing so will improve forecast accuracy, reduce capacity cost exposure for all ratepayers, and give ordinary customers scalable pathways to deliver system benefits and address the longstanding residual cost burden embedded in current Peak Load Contribution (“PLC”) / five coincident peak (“5CP”) allocation mechanisms.

The refinements and priority actions described herein are deliberately pathway-agnostic. They strengthen resource adequacy, equity, and customer agency whether PJM continues under the status quo Reliability Pricing Model (“RPM”), pursues a capacity-centric refinement, shifts primary signaling toward Energy and Ancillary Services (“E&AS”) markets with long-term energy contracting, or adopts another approach. Immediate Attachment B action requires no stakeholder process and should be executed at once. Expedited Attachment D work should follow on the fastest feasible schedule.

This paper first notes the structural pressures that make Manual 19 reform urgent, then addresses each of the seven questions with recommendations centered on these near-term, high-value actions, and concludes with a call for prioritized implementation.

II. STRUCTURAL PRESSURES MAKING MANUAL 19 REFORMS URGENT UNDER ANY PATHWAY

The White Paper correctly diagnoses a region facing unprecedented large-load driven demand growth, accelerated retirements, extended development timelines, and repeated capacity shortfalls relative to the Reliability Requirement.³ Recent Base Residual Auction outcomes have cleared near administrative caps while producing only modest new entry, underscoring mismatches between product design, lead times, and financing realities.⁴

Compounding these pressures is a longstanding equity and efficiency problem in cost allocation and load forecasting. Capacity costs are allocated predominantly through PLC mechanisms tied to 5CP hours or analogous metrics. Large commercial and industrial customers have long had greater ability to manage their contributions. Residential and small commercial customers face structural barriers: costs are socialized through class averages and residual allocation, and existing processes and rate designs often prevent customers from using automation and devices already present or readily installable in modern homes, including batteries, electric vehicle supply equipment, smart thermostats, water heaters, and other resources, particularly those capable of injection, to reduce peaks and their cost exposure.⁵

The apparent inelasticity of residential demand is not a physical given; it is in significant part an artifact of legacy design that hides or blocks price and performance signals from capable technologies. While large-load growth has exacerbated this pre-existing residual burden on small customers, it is not the original cause. State-level steps such as negative PLC are welcome for injection capable residential customers but marginal; they do not substitute for accurate wholesale forecast treatment of verified demand-side reductions.

Multiple PJM states are actively working toward near-term implementation of technology-neutral programs through legislation and RERRA proceedings specifically to reduce zonal capacity purchase obligations for the benefit of ratepayers. In order for these programs to work, they explicitly require or will rely upon the Peak Shaving Adjustment (PSA) mechanism under Manual

19 Attachment D. In parallel, PJM has already stated its intent to utilize the PSA framework at the state/EDC level as a qualifying means for EDCs to adjust or opt out of portions of Reliability Backstop Procurement obligations when those needs are addressed through codified state peak-shaving programs.

These parallel state and PJM actions underscore the urgency of immediate Manual 19 Attachment B demand-side reduction clarification (under PJM’s existing authority) and expedited Attachment D modernization. Without prompt, non-discriminatory operationalization of these Manual 19 tools, including modern M&V suitable for residential and injection-capable resources, state programs and PJM’s own backstop-related PSA pathways cannot deliver their full, intended wholesale forecast and Reliability Requirement reductions. Accurate, verified treatment must be available now so that residential customers with eligible technologies, especially those with injection capability, can contribute measurable system benefits under any market design pathway.

Under any market design pathway, improved load forecast accuracy and the ability of residential customers with eligible technologies (especially injection-capable resources) to provide verifiable system benefits are foundational. Manual 19 Attachments B and D already supply the mechanisms. They need only prompt, non-discriminatory operationalization and targeted modernization so that committed, measurable peak reductions lower the unrestricted forecast and Reliability Requirement in the same manner that verified load additions increase them. These changes deliver immediate ratepayer value, enhance reliability planning, and preserve optionality while longer-term design questions are resolved.

III. RESPONSES TO THE SEVEN QUESTIONS

Question 1: The Path(s) PJM Should Pursue and Why

We are evaluating the paths and options presented in the White Paper (Paths A, B, and C, as well as potential hybrids and refinements) and are developing our position. We look forward to further education, analysis, and stakeholder discussion before taking a firm view on the optimal long-term direction.

What is already clear is that certain near-term actions are necessary and beneficial under any pathway:

- **Immediate Manual 19 Attachment B action under existing authority and expedited Attachment D modernization** (highest near-term priority; fully detailed under Question 3). These steps enable verified peak-reducing resources and programs, including those involving residential and small commercial customers with eligible technologies and especially resources with injection capability, to lower load forecasts and Reliability Requirements promptly. They deliver ratepayer value, improve planning accuracy, and give customers agency regardless of whether the longer-term design remains capacity-centric, shifts toward E&AS and forward energy contracting, or takes another form.
- Continued attention to E&AS market improvements, long-term contracting frameworks for consumer protection and bankability, residual resource adequacy mechanisms, large-load accountability, and removal of barriers to flexible and distributed resources will be relevant under multiple paths. We will engage on the appropriate weighting and sequencing of these elements as our position develops.

In short, Manual 19 reforms that unlock residential and injection-capable resources for system benefit should proceed immediately and are fully compatible with every option under consideration.

Question 2: Additional or Supplemental Paths for States

States retain primary authority over retail rate design, default-service procurement, and distribution-level programs. Complementary state actions that would reinforce customer benefits and system efficiency under any wholesale path include:

- Retail rate designs and default-service offerings that enable residential and small commercial customers to respond to or share in the value of flexibility, and that facilitate enrollment in EDC or aggregator peak-shaving and virtual power plant (“VPP”) programs.
- State or EDC administration of peak-shaving, VPP, and residential demand-side programs that coordinate with PJM Manual 19 processes so verified reductions produce both wholesale forecast benefits and retail bill savings.
- Coordination on dual participation, interconnection standards, and distribution hosting capacity so that behind-the-meter resources — including those with injection capability — can stack wholesale E&AS, residual capacity, and retail value streams without unnecessary barriers.
- Large-load interconnection and tariff policies emphasizing cost causation, bring-your-own-supply options, and, if needed, appropriate interruptibility.
- Consumer-protection standards ensuring that value from flexibility and any hedging flows through to retail customers with transparent accounting.

These measures help translate wholesale improvements into retail affordability and agency, particularly for residential customers with modern technologies.

Question 3: Specific Areas That Should Be Included in Stakeholder Process Scope

The following areas should be included because they stabilize markets, support resource adequacy, correct barriers facing residential and small commercial customers, and preserve optionality across pathways. Manual 19 reforms stand first as highest near-term priority. The Attachment B clarification requires no stakeholder process and should be implemented by PJM immediately under existing authority.

1. **Manual 19 reforms for demand-side enablement** (highest near-term priority for ratepayer value and system benefit):
 - **Attachment B Load Forecast Adjustment Guidelines – Immediate implementation of mirrored demand-side reductions under existing authority.** Attachment B already establishes guidelines for Electric Distribution Companies (“EDCs”) and Load Serving Entities (“LSEs”) to propose, and for PJM to evaluate and incorporate, significant load forecast adjustments (positive or negative) so that the forecast accurately reflects known deviations not captured in the base econometric model. Adjustments are documented, reviewed with the Load Analysis Subcommittee, and subject to PJM final determination.⁶ PJM should immediately clarify and operationalize that verified, committed peak reductions qualify for negative (downward) load forecast adjustments on a mirrored basis.

The plan submission and treatment under Attachment B for these demand-side reductions shall mirror the Peak Shaving Adjustment plan requirements, documentation, commitment standards, performance rating, officer certification, and review processes of Attachment D in all respects, except for the measurement and verification methodology (which shall utilize methods already established in Manual 11, including Metered Generator Output and related approaches suitable for modern resources, including those with injection capability). This ensures only necessary and relatively minor clarifications to mechanisms already in use. It is not intended for simple claims of 5CP reduction without the full committed plan, verification, and performance accountability analogous to a Peak Shaving Adjustment. Reductions lower the unrestricted forecast and the resulting Reliability Requirement in the same manner that verified large-load additions increase them. The existing significance threshold (category total of 50 MW or greater) applies at the zonal level, consistent with Attachment B.

- **Authority and timing:** This clarification lies squarely within PJM’s existing responsibilities and Manual 19 framework. The PJM Tariff and the Reliability Assurance Agreement among Load Serving Entities in the PJM Region assign PJM the duty to develop accurate load forecasts that form the foundation for resource adequacy determinations, capacity obligations, and the Regional Transmission Expansion Plan. Attachment B exists precisely to ensure the forecast incorporates significant known changes. Applying the same accuracy, documentation, verification, and review principles non-discriminatorily to demand-side reductions as to load additions, while mirroring the established Peak Shaving Adjustment process except for M&V, requires no new Tariff authority and no stakeholder process as a prerequisite. It is an implementation clarification and template or guidance update that PJM can and should execute immediately under existing oversight, with notice to the Load Analysis Subcommittee. Performance true-ups and officer certification protect against over-crediting. PJM should implement this mirrored treatment immediately, effective for the next feasible load forecast cycle. Doing so will lower Reliability Requirements for verified flexibility, reduce capacity cost exposure for all ratepayers, and give residential and small commercial customers, especially those with injection-capable technologies, a direct pathway to deliver system benefits and offset residual burdens.
- **Attachment D Peak Shaving Adjustment Plan and Performance Rating – Expedited modernization.** Attachment D already provides a structured process for Peak Shaving Adjustment Plans, including required documentation, officer certification (Attachment E), incorporation into the load forecast model, and a rolling multi-year performance rating that adjusts future credit for actual delivery.⁷ Expedited revisions, kept as narrow and short-path as possible, should modernize the framework to reflect current capabilities:
 - Explicitly incorporate M&V methods already addressed in Manual 11, including Metered Generator Output (“MGO”), high-quality inverter-based telemetry, and other device-level metering suitable for batteries, electric vehicle supply equipment, smart thermostats, water heaters, and similar resources (particularly those with injection capability), aligned with Manual 11 baselines and Demand Response measurement practices;

- Explicitly incorporate and value winter peak shaving capability, triggers, and performance measurement alongside existing summer value and triggers;
- Provide interim recognition or mirrored Attachment B treatment for qualifying programs meeting significant-size and verification thresholds while full Attachment D approval is processed; and
- Ensure anti-double-counting.

These are incremental modernizations of an existing framework. They can be developed on an accelerated stakeholder schedule drawing on Load Analysis Subcommittee expertise. Because Manual 11 already addresses the relevant M&V approaches, the work can proceed directly to implementation language. Together with immediate Attachment B clarification, these changes enable verified demand-side flexibility, including injection-capable residential resources, to reduce system peaks and costs promptly under any longer-term market design.

2. **E&AS market enhancements, long-term contracting frameworks, residual resource adequacy mechanisms, VPP/Demand Response/Order 2222 barrier removal, large-load cost-causation rules, and related interconnection/transmission interfaces** — these topics will be relevant under multiple paths. We support their inclusion in the scope for education and development while positions on ultimate direction continue to form. Dual participation and baseline modernization remain important so modern devices and aggregations, including those that inject, can provide multiple services with proper measurement and without unnecessary barriers.

Focusing immediate effort on Manual 19 (while PJM implements the Attachment B clarification under existing authority) directly improves forecast accuracy, unlocks residential and injection-capable resources for system benefit, and lowers costs for ratepayers while preserving full optionality on longer-term design.

Question 4: Areas That Should Remain Out of Scope

We do not have a position on out of scope items at this time.

Question 5: Recommended Stakeholder Process

A structured, time-bound process under appropriate committee oversight, with Board visibility, is recommended for items requiring it. The Attachment B mirrored-reduction clarification does not require stakeholder process and should be implemented by PJM immediately.

- Immediate PJM administrative action: Operationalize Attachment B mirrored demand-side reductions under existing authority (plans mirroring Peak Shaving Adjustment processes except for M&V methodology, with 50 MW zonal threshold), with notice to the Load Analysis Subcommittee and conforming guidance or templates, effective for the next feasible load forecast cycle.
- Expedited track for Manual 19 Attachment D modernization (target accelerated first and second reads).

- Parallel or subsequent workstreams for other topics listed in Question 3, sequenced to allow continued evaluation of longer-term pathways.
- Regular education sessions, technical conferences as needed, Independent Market Monitor input, and transparent posting of materials.
- Coordination with related efforts (large-load, queue, reliability backstop) to avoid duplication.

This approach ensures the highest-value, fully authorized forecast and customer-enablement improvements are not delayed.

Question 6: Issue Prioritization and Timing

Prioritization should maximize near-term ratepayer and system value by aligning forecast-adjusting mechanisms with current PJM and state-level forecast reduction initiatives while longer-term options are evaluated:

1. **Immediate (effective next feasible load forecast cycle):** PJM implementation of Manual 19 Attachment B mirrored demand-side reduction treatment under existing authority (plans mirroring Peak Shaving Adjustment in all respects except M&V methodology; 50 MW threshold at zonal level). This requires no stakeholder process. It improves forecast accuracy and enables residential customers with eligible technologies, especially those with injection capability, to provide verifiable system benefits.
2. **Immediate / parallel expedited:** Manual 19 Attachment D modernization on the fastest feasible schedule. Relevant M&V methods are already covered in Manual 11.
3. **Near- and medium-term:** Continued education and development of other elements (E&AS, contracting frameworks, residual mechanisms, etc.) on timelines that support informed decision-making among the paths under evaluation.
4. **Ongoing:** Monitoring of impacts, iterative refinement, and full stakeholder engagement as positions develop.

Independent analysis of bill and system-cost impacts should accompany major packages.

Question 7: Requested Education or Analysis from PJM

To support informed evaluation of options and the priority Manual 19 reforms, PJM (with Independent Market Monitor support as appropriate) should provide:

- Updated quantitative comparison of capacity cost allocation to residential and small commercial classes versus large C&I under current PLC/5CP mechanics, including sensitivities to peak shaving, injection-capable resources, and forecast adjustments.
- Inventory and characterization of recent auction outcomes, new-entry patterns, and bilateral contracting activity.
- Scenario analysis of load-forecast and Reliability Requirement impacts from scaled residential and distributed peak-shaving/injection programs under Attachment B/D treatment.
- Any additional pathway comparison data that will assist stakeholders in evaluating the White Paper options.

No separate prerequisite technical assessment of M&V methods is required for Attachment D modernizations, as Manual 11 already addresses the relevant approaches. The Attachment B clarification requires no analysis or process delay; it should proceed immediately under existing authority.

IV. CONCLUSION

We are evaluating the market design options presented in the White Paper and developing our position. We look forward to engaging productively as the process advances.

What should not wait is the enablement of residential customers with eligible technologies, especially those with injection capability, to deliver verifiable peak reductions and system benefits. Immediate implementation of Manual 19 Attachment B mirrored demand-side reductions under existing authority (mirroring Peak Shaving Adjustment processes except for M&V, with the 50 MW zonal threshold), paired with expedited Attachment D modernization, will improve forecast accuracy, lower Reliability Requirements for committed flexibility, reduce costs for all ratepayers, and give ordinary customers agency under any pathway that ultimately emerges. These steps are pathway-agnostic, fully authorized, and high-value.

Tesla urges PJM to implement the Attachment B clarification immediately so benefits can begin with the next load forecast cycle, and to advance Attachment D reforms on an accelerated schedule. We stand ready to collaborate on implementation details, redlines, analysis, and constructive dialogue on both the near-term reforms and the longer-term design questions.

Respectfully submitted,

Tesla, Inc.

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FOOTNOTES

¹ PJM Interconnection, L.L.C., Request for Papers, Powering Reliability Through Market Design Workshop (Aug. 4, 2026), available at <https://www.pjm.com/-/media/DotCom/committees-groups/workshops/prtmdw/postings/2026/20260804-call-for-papers.pdf>.

² PJM Interconnection, L.L.C., *Powering Reliability Through Market Design: Addressing Rising Demand and Constrained Supply, and Stimulating Investment To Support Durable Reliability* (May 6, 2026), available at <https://www.pjm.com/-/media/DotCom/library/reports-notice/special-reports/2026/20260506-powering-reliability-through-market-design.pdf>.

³ *Id.* at Executive Summary and related sections.

⁴ PJM Interconnection, L.L.C., 2028/2029 Base Residual Auction Results and related public materials.

⁵ This cost-allocation and barrier dynamic has been noted across consumer-advocate and related filings. Large-load growth has exacerbated the pre-existing residual burden on residential and small commercial customers.

⁶ PJM Manual 19: Load Forecasting and Analysis, Attachment B: Load Forecast Adjustment Guidelines (current revision). The significance threshold of a category total of 50 MW or greater is applied at the zonal level. The mirrored demand-side application (plans mirroring Attachment D except for M&V methodology) is a direct implementation of existing authority and requires no stakeholder process.

⁷ PJM Manual 19: Load Forecasting and Analysis, Attachment D: Peak Shaving Adjustment Plan and Performance Rating, and related Attachment E; Manual 11 already contains applicable M&V provisions (including Metered Generator Output) suitable for modern and injection-capable resources.

Additional supporting references include the PJM Open Access Transmission Tariff, the Reliability Assurance Agreement among Load Serving Entities in the PJM Region, Manual 11, recent BRA reports, and publicly available Load Analysis Subcommittee materials. All factual statements regarding auction outcomes, White Paper options, and Manual 19 language are drawn from cited primary PJM documents.