

September 6, 2024

Debbie-Anne A. Reese, Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426-0001

*Re: PJM Interconnection, L.L.C., Docket No. ER24-__-000
Proposal to Enable Energy Efficiency to Benefit Loads Through Demand-Side Reduction to the Peak Load Forecast and Savings from Energy Market Charges*

Dear Secretary Reese:

Pursuant to section 205 of the Federal Power Act (“FPA”),¹ and part 35 of the Federal Energy Regulatory Commission’s (“Commission”) Regulations,² PJM Interconnection, L.L.C. (“PJM”) proposes revisions to the PJM Open Access Transmission Tariff (“Tariff”) and Reliability Assurance Agreement (“RAA”) to prospectively sunset Energy Efficiency Resource participation in PJM’s wholesale capacity market, known as the Reliability Pricing Model (“RPM”), beginning with the Base Residual Auction that is associated with the 2026/2027 Delivery Year.³ PJM respectfully requests that the Commission accept the Tariff and RAA revisions described herein with an effective date of November 6, 2024, which is 61 days from the date of this filing.⁴ This proposal was

¹ 16 U.S.C. § 824d.

² 18 C.F.R. part 35.

³ The Base Residual Auction for the 2026/2027 Delivery Year is scheduled to commence on December 4, 2024.

⁴ As discussed below, PJM’s proposal would not unsettle past RPM Auction results, including results for the 2025/2026 Delivery Year. In addition, acceptance of this rule change would also preclude Fixed Resource

endorsed by a sector-weighted majority of PJM's stakeholders at the Markets and Reliability Committee ("MRC") and the Members Committee ("MC") on August 21, 2024, after nearly a year of consideration and deliberations.

I. INTRODUCTION

PJM does not take this step lightly. PJM has long recognized, and continues to recognize, that energy efficiency benefits the PJM Region and the resulting reduction in energy consumption. Energy efficiency also provides value by reducing the need for load serving entities to procure capacity and the attendant costs of maintaining capacity levels (e.g., replacement generation, new transmission, etc.).

The question that gives rise to this filing is ***not*** whether energy efficiency is beneficial or whether it lowers energy costs. Clearly, it does. Rather, the issue is much more targeted and focused on how end-use customers realize the benefits of their energy efficiency actions. Specifically, the question presented is whether customers should be required to make *capacity payments* to energy efficiency providers when: (1) PJM's peak load forecast used to set the demand curve already includes the projected net impacts of energy efficiency actions, which was not the case when the Commission last reviewed participation of energy efficiency in PJM's capacity market; (2) there is no evidence of any causal link between capacity market payments for Energy Efficiency Resources and the deployment of energy efficiency projects; and (3) consumers that install energy efficiency

Requirement ("FRR") Entities from including Energy Efficiency Resources in their FRR Capacity Plans. However, this would have no practical effect, as FRR Capacity Plans have never included any megawatts of Energy Efficiency Resources.

measures already reap the economic benefit of lower capacity costs through a lower peak load obligation from reductions in energy consumption.

While different companies have varying energy efficiency participation models, capacity payments to Energy Efficiency Resource sellers generally serve to increase costs to consumers without causing an incremental decrease in load over and above actions that (1) consumers would have taken regardless of capacity revenues or (2) are already funded through other existing revenue streams. Further, as discussed herein, energy efficiency is no longer a nascent industry warranting capacity revenues given advancements in technologies and naturally occurring end-use customer incentives to avoid energy and energy-delivery charges.

In short, as demonstrated below, end-use customers installing energy efficiency measures and other customers who are forced to subsidize those efforts are realizing no discernible incremental benefits from Energy Efficiency Resources that receive capacity payments.⁵ As the costs being borne by consumers to support Energy Efficiency Resource sellers' cleared offers have risen to as high as \$144 million for the 2025/2026 Delivery Year alone,⁶ the time has come to recognize that continuing to require load to pay for Energy Efficiency Resources through the PJM capacity market is no longer appropriate.

⁵ See *Independent Market Monitor for PJM v. Indicated Energy Efficiency Sellers*, Complaint of the Independent Market Monitor for PJM, Docket No. EL24-113-000, at 4 (May 31, 2024) ("EE payments are a subsidy paid directly by load via an uplift charge, through the capacity market mechanism. The term capacity market mechanism is used rather than capacity market because EE does not participate in the capacity market but is nonetheless paid the capacity market clearing price. EE should not continue to be paid the capacity market clearing price because PJM's load forecasts now account for EE."). For the 2024/2025 Delivery Year, capacity payments due to energy efficiency providers totals about \$128 million. See *id.* at 1.

⁶ See *id.* at 7, 17.

This proposal seeks to appropriately recognize energy efficiency on the demand side and ultimately benefit consumers by avoiding capacity charges for energy efficiency, which is already reflected in the load forecast in the aggregate. The Independent Market Monitor for PJM (“Market Monitor”) has advocated for the removal of Energy Efficiency Resources from the capacity market for many years⁷ and based on additional experience, both PJM and a sector-weighted super majority of the PJM’s stakeholders now concur.

A. *Energy Efficiency Resource Sellers Should Not Receive Capacity Payments Without Providing Commensurate Benefits.*

The underlying question presented in this filing is very specific and targeted. By definition, per RAA Schedule 6, section L.1., Energy Efficiency Resources eligible to participate in the RPM Auctions are limited to energy efficiency projects “not reflected in the peak load forecast.”⁸ Since 2016, PJM’s peak load forecast⁹ has accounted for the projected deployment of energy efficiency in aggregate within the PJM Region.¹⁰ The peak load forecast informs the amount of capacity that PJM must procure through the RPM Auctions. Thus, the more megawatts (“MW”) of energy reduction due to energy efficiency

⁷ See, e.g., *2023 State of the Market Report for PJM*, Monitoring Analytics, LLC, section 1, page 38 (Mar. 14, 2024), https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2023/2023-som-pjm-sec1.pdf (“The MMU recommends that Energy Efficiency Resources (EE) not be included in the capacity market because PJM’s load forecasts have accounted for EE since the 2016 load forecast for the 2019/2020 delivery year, and the tariff rationale for inclusion no longer exists. (Priority: Medium. First reported 2016. Status: Not adopted.)” (footnote omitted)).

⁸ Tariff, Attachment DD-1, section L.1; RAA, Schedule 6, section L.1.

⁹ PJM prepares a long-term load forecast report (“PJM Load Forecast”), which includes the peak load forecast used in RPM Auctions.

¹⁰ As discussed below, Mr. Andrew Gledhill, who is responsible for overseeing PJM’s long-term resource adequacy studies and production of the PJM Load Forecast, demonstrates that peak load forecast captures the energy efficiency capability installed in the PJM Region. See Attachment C, Affidavit of Andrew Gledhill on Behalf of PJM Interconnection, L.L.C. (“Gledhill Aff.”).

are captured in the peak load forecast, the less capacity PJM procures to maintain reliability.

As a result, through the use of a forward-looking peak load forecast, which incorporates energy efficiency as detailed in the attached affidavit of Mr. Andrew Gledhill, the PJM Region directly realizes the benefits of energy efficiency projects as they reduce the amount of capacity that PJM must procure. Therefore, additional compensation to Energy Efficiency Resource sellers through the RPM Auctions for the same underlying energy efficiency is duplicative and leads to the energy efficiency simultaneously participating on both the supply *and* demand side in the capacity market. Clearly, this is an untenable and unnecessarily costly result. If megawatts of energy efficiency capability captured on the demand side of an RPM Auction through a reduction of the peak load forecast are *also* allowed, on the supply side, to contribute toward meeting the PJM Region Reliability Requirement, those megawatts will be double counted and would result in capacity under-procurement and risk the reliability of the grid.

PJM and its stakeholders previously attempted to address this double-counting issue, while allowing Energy Efficiency Resources to continue participating in RPM Auctions, by reconstituting the amount of Energy Efficiency Resources that clear the RPM Auction back into the load forecast (i.e., the “addback,” discussed below). Through the addback, Energy Efficiency Resources have been allowed to participate in PJM’s capacity auctions and receive capacity payments. But, because projected energy efficiency projects have already been accounted for in the load forecast in aggregate—and are thus reflected in the quantity of demand—Energy Efficiency Resources cannot be counted toward meeting the Reliability Requirement and cannot be substituted for any other committed

Capacity Resource. In short, while the addback approach addressed reliability concerns, the addback has also allowed Energy Efficiency Resources to receive capacity payments that are subsidized by all customers despite those customers realizing little, if any, incremental benefit in the form of increased reliability or reduced costs as a result of their payments. The amounts in question are not trivial, exceeding over \$144 million for the 2025/2026 Delivery Year.

B. The Current Rules Do Not Clearly Require a Causal Link Between Customer Energy Efficiency Actions and the Bids Submitted in the Auction by Energy Efficiency Providers.

After more than a decade of experience with Energy Efficiency Resources participating in the RPM Auctions, it has become clear that there is a lack of a causal link between end-use customer actions and capacity payments made to sellers of Energy Efficiency Resources. That is, PJM capacity market payments are not driving incremental energy efficiency in the PJM Region. In both the stakeholder process and ongoing complaint proceedings before the Commission, stakeholders have recognized that the capacity payments for cleared Energy Efficiency Resources alone do not cause incremental energy efficiency measures to be purchased and installed.¹¹

Current energy efficiency trends will continue to reduce energy consumption irrespective of wholesale market payments. Those trends will continue to be captured in

¹¹ See, e.g., Alex Stern, *Exelon EE Package Proposal*, Exelon Corp. (Aug. 7, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240807/20240807-item-02a-1---ee-resource-evaluation-exelon-proposal---presentation.ashx> (“No matter what happens at PJM, state EE programs themselves would not be gone. They will still play a vital and appropriate role within each state and contribute on the load forecasting side at PJM.”).

the PJM load forecast as noted in Mr. Gledhill’s affidavit, allowing that reduced consumption to be recognized in lower levels of capacity procurement than would otherwise occur absent the energy efficiency measures. New, more efficient technologies and practices have and will continue to emerge without wholesale capacity payments by PJM loads. Indeed, states continue to adopt increasingly strict building codes.¹² Most of the energy efficiency in PJM is either a result of customers responding to market prices reflected through their retail energy bills¹³ or already incentivized through various federally- and state-regulated programs. The Department of Energy also “sets energy efficiency-standards and test procedures for more than 50 residential, commercial, and industrial products,”¹⁴ and continues to issue appliance efficiency standards pursuant to its authority under the Energy Policy Act of 2005.¹⁵ Building codes and other energy efficiency standards continue to be updated, lowering the baseline from which energy efficiency reductions can be measured. In addition, a limited amount of energy efficiency capability in the PJM Region is the product of utility programs, carried out in accordance

¹² For example, the State of Maryland, on May 29, 2023, adopted the 2021 International Energy Conservation Code and required, by law, all jurisdictions with the state “to amend and adopt the new code for local code enforcement by May 29, 2024,” to implement the 2021 *International Energy Conservation Code (IECC) Information Page*, Maryland Energy Administration, <https://energy.maryland.gov/Pages/policy-energy-codes.aspx> (last visited Sept. 5, 2024).

¹³ That is, the energy efficiency adoption is naturally occurring in that the motivation or drivers for such adoption are unrelated any regulated incentive program—think people purchasing a heat pump to replace an older, more energy-intensive HVAC system.

¹⁴ Office of Energy Efficiency & Renewable Energy, *Rulemakings and Notices*, U.S. Department of Energy, <https://www.energy.gov/eere/buildings/rulemakings-and-notice> (last visited Sept. 4, 2024).

¹⁵ The U.S. Department of Energy (“DOE”) has created the Appliance Standards and Rulemaking Federal Advisory Committee in an effort to further improve the process of establishing energy-efficiency standards for certain appliances and commercial equipment.

with applicable state agency directives. None of these actions are dependent on capacity payments, nor has there been shown to be a clear causal link since end-use customers may not even be aware of the capacity payments. Indeed, New York Independent System Operator, Inc. does not accept energy efficiency bids into its capacity market, instead deferring to the load forecast to capture these state and federal initiatives.¹⁶

C. PJM Proposes a Just and Reasonable Rule Change on a Prospective Basis.

After years of experience, coupled with a careful review of what energy efficiency sellers have been including in their offers, it has become obvious to PJM, and a sector-weighted super majority of the PJM Members, that the current paradigm is no longer appropriate. Under the current framework, energy efficiency projects are compensated at the relevant RPM Auction clearing price on the supply side even though energy efficiency capability has already been incorporated into the load forecast in aggregate and reduced the amount of capacity that needs to be procured in the RPM Auction. Further, the end-use customers that implemented the energy efficiency, and the associated load serving entity, benefit from lower capacity costs. This is because their capacity allocation, which is based on their specific peak load contribution, is reduced by their lower electricity consumption and reduced energy costs. At the same time, the current market rules do not explicitly require any nexus between capacity payments to Energy Efficiency Resources

¹⁶ See *N.Y. Indep. System Operator, Inc.*, 179 FERC ¶ 61,198, at P 112 (2022) (“[W]e agree with NYISO that it should not be required to change its capacity market qualification requirements to enable energy efficiency resources (or any other resource type that currently does not qualify) to participate in NYISO’s capacity market.”), *order on reh’g*, 181 FERC ¶ 61,054 (2022).

and an Energy Efficiency Resource's incremental reduction in energy consumption as a result of those capacity payments. Stated another way, load serving entities within the PJM Region are paying capacity charges for Energy Efficiency Resources that clear the RPM Auction without getting a commensurate benefit in return.¹⁷

Acceptance of this filing does not mean that energy efficiency will have no place in the PJM Region. In fact, during extensive stakeholder discussions about this issue, PJM's stakeholders made clear that utilities within the PJM footprint will continue to incentivize energy efficiency projects based on various state-mandated programs irrespective of whether Energy Efficiency Resources continue to receive wholesale market revenues from PJM.¹⁸ PJM's peak load forecast is developed through a top-down load analysis that accounts for the adoption of energy efficiency in aggregate in the PJM Region.¹⁹ Such consideration of energy efficiency in the peak load forecast reduces costs to load by decreasing the demand in the capacity market, and in turn reducing the amount of capacity procured. Thus, energy efficiency projects will continue to receive economic benefits via reduced wholesale costs and the natural incentive of lower energy costs. There is simply no reason the same energy efficiency should be simultaneously compensated for

¹⁷ To the extent Energy Efficiency Resources ever required a subsidy to spur their growth, that time has passed. The industry is no longer in its infancy. As discussed in this letter, energy efficiency adoption in PJM has grown in PJM in accordance with the continued adoption of federal and state standards, and is wholly unrelated to capacity payments.

¹⁸ See Alex Stern, *Exelon EE Package Proposal*, Exelon Corp. (Aug. 7, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240807/20240807-item-02a-1---ee-resource-evaluation-exelon-proposal---presentation.ashx> ("No matter what happens at PJM, state EE programs themselves would not be gone. They will still play a vital and appropriate role within each state and contribute on the load forecasting side at PJM.").

¹⁹ See generally *Gledhill Aff.*

capacity revenues based on the same underlying project that also receives a reduction in demand costs. As a result, PJM now submits this stakeholder-endorsed proposal to sunset the participation of Energy Efficiency Resources in PJM's capacity market beginning with the 2026/2027 Base Residual Auction scheduled to commence on December 4, 2024.²⁰

PJM seeks to apply the proposed market rule change on a prospective basis and is not proposing to unsettle RPM Auction results or undo any existing Energy Efficiency Resource commitment under the current Tariff and RAA rules. The filed rate doctrine precludes retroactive changes for past actions where legal consequences have attached.²¹ As a result, Energy Efficiency Resources that cleared the RPM Auctions for the 2025/2026 Delivery Year will need to follow through on their commitments and submit compliant post-installation measurement and verification plans in advance of that Delivery Year to substantiate their cleared quantities.²²

Finally, acceptance of this proposal promotes regulatory efficiency, as it would allow the Commission to dispose of two pending energy efficiency complaints filed by the Market Monitor for PJM and various consumer advocates, respectively,²³ since this proposal also eliminates the use of an addback that is the subject of those complaints.

²⁰ *RPM Auction Schedule*, PJM Interconnection, L.L.C., (Aug. 1, 2024), <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/rpm-auction-schedule.ashx>.

²¹ *See, e.g., N. Va. Elec. Coop., Inc. v. FERC*, 945 F.3d 1201 (D.C. Cir. 2019).

²² *See* Tariff, Attachment DD-1, section L.6; RAA, Schedule 6, section L.6.

²³ *See Independent Market Monitor for PJM v. PJM Interconnection, L.L.C.*, Complaint of the Independent Market Monitor for PJM, Docket No. EL24-126-000 (July 11, 2024); *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Complaint of the Joint Consumer Advocates, Docket No. EL24-118-000 (June 20, 2024).

II. BACKGROUND

PJM has long recognized the importance of energy efficiency measures and has, over the last 18 years, worked diligently with stakeholders to promote energy efficiency (and reduce energy consumption) while also maintaining reliability at just and reasonable rates. The balance between maintaining reliability, supporting all resource types (including Energy Efficiency Resources), and ensuring just and reasonable rates has been and remains front-of-mind for PJM. This is particularly true in the context of PJM's rules for Energy Efficiency Resource sellers, who have been permitted to participate in and receive compensation through the RPM since 2009.

A. *Only Energy Efficiency Resources Composed of Projects Not Included in the Load Forecast May Be Offered in the RPM.*

In 2009, as part of the framework allowing energy efficiency sellers to participate in the RPM, the Commission also accepted PJM's proposed definition of Energy Efficiency Resource. As explicitly set forth in the Tariff and RAA, *only* energy efficiency projects that meet the definition of Energy Efficiency Resource may be offered into an RPM Auction as an Energy Efficiency Resource.²⁴

Thus, the long-standing Commission-approved definition of Energy Efficiency Resource in PJM's Tariff is the appropriate starting point for a careful review of the role of energy efficiency participation in PJM's wholesale markets. The RAA defines Energy

²⁴ See Tariff, Attachment DD, section 5.5 ("Capacity Resources must satisfy the capability and deliverability requirements of RAA, Schedule 9 and RAA, Schedule 10, the requirements for Demand Resources or Energy Efficiency Resources in Tariff, Attachment DD-1 and RAA, Schedule 6, as applicable, and, the criteria in Tariff, Attachment DD, section 5.5A."); RAA, Schedule 6, section L.1.

Efficiency Resource as “a project . . . designed to achieve a continuous . . . reduction in electric energy consumption at the end-use customer’s retail site” that is also:

- “fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.”²⁵

The definition of Energy Efficiency Resource is limited to projects:

- “not reflected in the peak load forecast prepared for the Delivery Year for which the Energy Efficiency Resource is proposed.”²⁶

Further, an Energy Efficiency Resource:

- “include[es] installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards.”²⁷

In other words, by definition, the only energy efficiency projects permitted to be offered into an RPM Auctions are those projects “*not* reflected in the peak load forecast.”²⁸

Furthermore, by definition, energy efficiency projects permitted to be offered into RPM Auctions are limited to projects that “exceed[] then-current building codes, appliance standards, or other relevant standards.”²⁹ In light of PJM’s current load forecast methodology, discussed in greater detail below, the peak load forecast used to set the demand curve now includes the projected net impacts of energy efficiency actions.

²⁵ Tariff, Attachment DD-1, section L.1; RAA, Schedule 6, section L.1.

²⁶ Tariff, Attachment DD-1, section L-1; RAA, Schedule 6, section L.1.

²⁷ Tariff, Attachment DD-1, section L-1; RAA, Schedule 6, section L.1.

²⁸ Tariff, Attachment DD-1, section L-1; RAA, Schedule 6, section L.1.

²⁹ Tariff, Attachment DD-1, section L-1; RAA, Schedule 6, section L.1.

1. The PJM Peak Load Forecast Has Evolved to Capture Energy Efficiency.

In 2009, when PJM proposed inclusion of energy efficiency in the capacity market, there was a multi-year gap between when future energy efficiency clearing in the capacity market would be reflected in the load forecast. That is, until 2016, the PJM Load Forecast modeled energy efficiency contributions by using a methodology that correlated load with economic factors,³⁰ and only implicitly captured energy efficiency trends through observed loads in the RPM Auction held three years prior to the Delivery Year.³¹ As a direct result of this methodology, when Energy Efficiency Resources were added to the capacity market in 2009, “there was a four-year lag between when energy efficiency projects were installed and when they would appear in the load history of the peak load forecast, which was then used to determine the amount of capacity that would need to be procured through the Base Residual Auction for a given Delivery Year.”³² As a result, PJM proposed, and the Commission accepted, that an energy efficiency project could only support an Energy Efficiency Resource for up to four years, where appropriate.

The four-year lag has since been eliminated.³³ As explained below, the “gap period” that justified the inclusion of Energy Efficiency Resources on a time-limited basis in the capacity market no longer exists, as a result of methodological changes in how PJM

³⁰ See Gledhill Aff. ¶¶ 16-17.

³¹ *Id.*

³² *Id.* ¶ 17. *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at PP 131-32, *order on clarification & reh’g*, 128 FERC ¶ 61,157 (2009).

³³ See Gledhill Aff. ¶ 19.

undertakes its load forecast to be utilized in the RPM Auctions, and therefore, that barrier to recognizing energy efficiency benefits in the capacity market has been eliminated.

2. *PJM's Current Peak Load Forecast Is Based on Well-Established Forward-Looking Methods and Robust Data.*

The PJM Load Forecast is an annual report consisting of hourly and expected peaks over the next 15 years based on well-established statistical modeling methods and robust historical and forward-looking data that directly and consistently captures energy efficiency impacts on load.³⁴ According to Mr. Gledhill, “[t]he PJM Load Forecast uses estimating practices and modeling methods that are widely employed within the utility industry” and used by other independent system operators and regional transmission organizations.³⁵ The peak load forecast is “primarily based on publicly available data from Energy Information Administration (“EIA”)³⁶ and incorporates both historic energy data and future/independent drivers.³⁷ “More specifically, PJM relies on Form EIA-861M for historic energy use data and the EIA’s Annual Energy Outlook for forward-looking energy use data.”³⁸ In addition, PJM “regularly seeks and incorporates stakeholder feedback on the load forecast” and “[m]ethodology and results are discussed and reviewed at various stages of the PJM stakeholder process, primarily through the Load Analysis Subcommittee

³⁴ See Gledhill Aff. ¶¶ 4-5.

³⁵ *Id.* ¶¶ 6, 9.

³⁶ *Id.* ¶ 6, *see id.* ¶¶ 7, 24-27.

³⁷ *See id.* ¶ 12.

³⁸ *Id.* ¶ 7.

and Planning Committee.”³⁹ Furthermore, PJM has continued to make methodological enhancements through “an iterative process aimed at making the forecast as accurate as possible.”⁴⁰

Beginning with the 2016 PJM Load Forecast through the present, PJM has used end-use intensity modeling, based on end-use intensity values from the EIA Annual Energy Outlook (which are forward-looking in nature), to forecast energy efficiency impacts to load.⁴¹ Reliance on the forward-looking end-use intensity modeling has greatly improved PJM’s ability to capture the impact of energy efficiency projects in the peak load forecast. PJM’s end-use intensity modeling “eliminated the four-year lag between installation of an energy efficiency project and the reflection of that project’s impact on load in the PJM Load Forecast.”⁴²

PJM has engaged with outside consultants to validate its approach, promote transparency, and identify potential enhancements to the load forecast process.⁴³ Most recently, in 2022, PJM retained Itron, Inc. to engage in these tasks. Itron’s report on PJM’s load forecast process (“Itron Report”) is publicly available⁴⁴ and was discussed with stakeholders in the Load Forecast Subcommittee. The Itron Report noted that EIA had

³⁹ Gledhill Aff. ¶ 10.

⁴⁰ *Id.* ¶ 8.

⁴¹ *See id.* ¶¶ 18-19.

⁴² *Id.* ¶ 19.

⁴³ Gledhill Aff. ¶ 11.

⁴⁴ *See* Eric Fox, et al., *2022 PJM Model Review*, Itron, Inc. (Sept. 6, 2022), <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/pjm-model-review-final-report-from-itron.ashx> (“Itron Report”).

“made an effort to directly account for state and utility efficiency programs by mapping regional [energy efficiency] program expenditures to end-uses and ‘rebating’ (lowering the cost) of the high-efficient technology options.”⁴⁵ In addition, as the Itron Report observed, by relying on EIA data, PJM’s peak load forecast incorporates “underlying information on new technologies including number of units sold and associated efficiency information are updated on an on-going basis; this information is derived from annual appliance shipments data.”⁴⁶ Through the EIA data, PJM’s peak load forecast is able to reflect “[t]he impact of programs that encourage adoption of more efficient technology such as the Energy Star program and utility incentive programs are partly reflected in the shipments data that in turn are used in calibrating the [EIA Annual Energy Outlook] end-use models.”⁴⁷

As explained in the Itron Report, “[i]mpacts of State and Utility energy efficiency (EE) programs are captured in the model end-use intensities along with new standards and natural occurring efficiency improvements as old appliances are replaced with new appliance.”⁴⁸ Itron found that:

- In the commercial sector, efficiency impacts are embedded in the intensity projections.
- End-use stock efficiency (i.e., the fleet of efficiency appliances) is derived from an end-use choice model that moves the average stock efficiency based on stock turnover, new purchases, and relative life-cycle costs of competing technology options.

⁴⁵ Itron Report at 49.

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.* at 48.

- In this model, standards work to limit the least efficient options over time while declining costs in more efficient technologies result in greater adoption of the higher efficient technology options.

3. *Since 2009, Energy Efficiency Standards Have Become More Stringent and Standards Have Been Adopted by All States in the PJM Region.*

Energy Efficiency Resources qualified to be offered into RPM Auctions are limited to those projects that “exceed[] then-current building codes, appliance standards, or other relevant standards.”⁴⁹

When the Commission accepted PJM’s proposal to allow Energy Efficiency Resources to participate in the capacity market in 2009, energy efficiency technology, standards, and policies were still in their infancy.⁵⁰ The first state-wide Energy Efficiency Resource Standards⁵¹ had been enacted just ten years prior, in 1999 (in Texas),⁵² and as of April 2010, 24 states had Energy Efficiency Resource Standards in place.⁵³

Since then, energy efficiency standards have become more stringent at the federal, state, and local levels, including in all states in the PJM Region and the District of Columbia. By 2021, Energy Efficiency Reliability Standards had been adopted by 32 states

⁴⁹ Tariff, Attachment DD-1, section L.1; RAA, Schedule 6, section L.1.

⁵⁰ See Sandy Glatt & Beth Schwentker, *State Energy Efficiency Resource Standards Analysis*, U.S. Department of Energy, 4 (July 2010) https://www.eere.energy.gov/manufacturing/states/pdfs/eers_web_final.pdf.

⁵¹ Energy Efficiency Resource Standards “mandate a quantified energy efficiency goal for an energy provider or jurisdiction within a predetermined timeframe. The standards may encourage more efficient energy use or generation, may include a demand-side management program, and may be coupled with a state’s renewable portfolio standard.” *Energy Efficiency Policies and Programs*, U.S. Department of Energy, <https://www.energy.gov/scep/slsc/energy-efficiency-policies-and-programs> (last visited Sept. 5, 2024).

⁵² Sandy Glatt & Beth Schwentker, *State Energy Efficiency Resource Standards Analysis*, U.S. Department of Energy, 4 (July 2010) https://www.eere.energy.gov/manufacturing/states/pdfs/eers_web_final.pdf.

⁵³ *Id.*

and the District of Columbia.⁵⁴ As of 2017, DOE energy efficiency standards covered more than 60 categories of products,⁵⁵ and, in 2015 alone, DOE’s energy efficiency standards reduced the energy expenditures by approximately \$80 billion nationwide.⁵⁶ At the federal and state levels, commercial and residential construction codes mandate energy efficiency requirements. Federal, state, and local financial incentives and programs support energy efficiency measures.⁵⁷

These standards, which have continuously become more stringent as new technologies become available, naturally result in the adoption of energy efficiency actions without the need for capacity revenues. If anything, these constantly evolving efficiency standards have made it increasingly difficult for PJM to conclude that Energy Efficiency Resources being offered into RPM Auctions reflect energy efficiency projects that “exceed[] then-current building codes, appliance standards, or other relevant standards.”⁵⁸

⁵⁴ See *Energy Efficiency Resource Standards (EERS)*, National Conference of State Legislatures (Sept. 15, 2021), <https://www.ncsl.org/energy/energy-efficiency-resource-standards-eers>.

⁵⁵ See *Fact Sheet Energy Efficiency Standards for Appliances, Lighting, and Equipment*, Environmental and Energy Study Institute (Aug. 11, 2017), <https://www.eesi.org/papers/view/fact-sheet-energy-efficiency-standards-for-appliances-lighting-and-equipmen>.

⁵⁶ See *id.*

⁵⁷ See, e.g., *Energy Efficiency Policies and Programs*, U.S. Department of Energy, <https://www.energy.gov/scep/slsc/energy-efficiency-policies-and-programs> (last visited Sept. 5, 2024).

⁵⁸ Tariff, Attachment DD-1, section L.1; RAA, Schedule 6, section L.1.

4. *The Current PJM Forecasting Method, Which Utilizes EIA Analyses, Have Benefited End Use Customers by Reducing the Amount of Capacity Otherwise Required to Be Procured.*

The modeling of energy efficiency capability in the PJM Load Forecast has “directly contributed to . . . lower loads than would have otherwise been observed.”⁵⁹ In fact, as Mr. Gledhill explains, “[s]tatistical analysis strongly supports the inference that the energy efficiency capability embedded in the peak load forecast exceeds the Energy Efficiency Resources that clear or are offered in the RPM.”⁶⁰ If energy efficiency capability were being under-credited in the peak load forecast, the forecasted peak load would have been *higher* than weather normal peak load. But experience and comparison of the forward load forecast to actual observed loads does not bear this out. This invalidates the claim by some Energy Efficiency Resource sellers that PJM’s current load forecast methodology fails to account for certain of their energy efficiency projects. Indeed, a super-majority of PJM stakeholders agreed and voted in favor of the proposal presented in this filing.

In recent and publicly available written responses to stakeholder questions about energy efficiency, PJM compared the weather normal peak load in Delivery Year 2023

⁵⁹ Gledhill Aff. ¶ 35.

⁶⁰ *Id.* ¶ 31.

against the forecasted load.⁶¹ In 2023, the weather normal peak load in Delivery Year 2023 *exceeded* the forecasted peak load.⁶² According to Mr. Gledhill:

All else held equal, if the PJM Load Forecast had failed to account for significant energy efficiency reductions to load, the weather normal peak load in 2023/2024 Delivery would have been significantly *lower* than the forecasted peak load for that year. But, as the data reflects, the forecasted peak load for 2023/2024 Delivery Year was *higher* than the weather normal peak load in 2023/2024 Delivery Year.⁶³

Likewise, the most recent load forecasts for the 2024/2025 Delivery Year used for the Third Incremental RPM Auction were actually higher than the older forecast for the 2024/2025 Delivery Year used for the Base Residual Auction.⁶⁴ For the 2024/2025 Delivery Year, the 2023 Load Forecast, including energy efficiency capability, reflected 149,737 MW.⁶⁵ The currently anticipated summer peak for the 2024/2025 Delivery Year at the time PJM drafted the Q&A responses (in May 2024) was 151,247 MW.⁶⁶ Once again, Mr. Gledhill reasons: “All else held equal, if the PJM Load Forecast had failed to account for significant energy efficiency reductions to load, the 2023 Peak Load Forecast would have been significantly higher than the anticipated 151,247 MW load, not lower.”⁶⁷

⁶¹ *Questions Received/PJM Answers*, PJM Interconnection, L.L.C., 3 (May 1, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240501/20240501-item-07a---energy-efficiency-education---questions-and-answers.ashx>.

⁶² *Id.*

⁶³ Gledhill Aff. ¶ 33.

⁶⁴ *Id.* ¶ 34.

⁶⁵ *Id.* ¶ 34.

⁶⁶ *Id.*

⁶⁷ Gledhill Aff. ¶ 34.

B. The History of Energy Efficiency Resource Participation in PJM's RPM Is Connected to the History of the Load Forecast.

The participation of energy efficiency sellers in PJM's capacity market is, at root, the story of their inclusion in and exclusion from the peak load forecast and the RPM. Indeed, the *exclusion* of energy efficiency from the peak load forecast (i.e., *demand-side* load) was the basis for the Commission's finding, in 2009, that PJM's proposed *supply-side* solution of *including* energy efficiency providers in PJM's RPM was just and reasonable.⁶⁸ Since then, PJM's ability to accurately reflect energy efficiency adoption in the peak load forecast has improved significantly. Nevertheless, with one limited issue related to the use of an addback (discussed below), PJM and stakeholders have *not* reviewed the Energy Efficiency Resource participation rules since they were adopted over 15 years ago.

1. The Commission's Rationale for Approving Inclusion of Energy Efficiency in the Capacity Market Was Explicitly Based on Circumstances that No Longer Exist Relative to the Load Forecast.

In 2009, the Commission accepted PJM's proposal to revise its capacity market rules to enable Energy Efficiency Resources to participate. In doing so, the Commission highlighted its "belie[f] that [energy efficiency] providers should have the ability to obtain the full economic benefits of their investments," while also "not[ing] that the rates resulting

⁶⁸ See *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at P 131 ("Under PJM's current wholesale market structure, many retail customers who install energy efficiency measures do not capture the capacity benefit of the resources they install. PJM's proposal would allow an EE resource to bid into the auction, and if it is accepted, to bid for an additional three consecutive years. As a result, the resource may receive capacity payments for up to four consecutive years."); see also *id.* at P 134 ("PJM, however, has shown that as a result of the lag in load forecasting, EE resources are not completely represented in the four years for which PJM is proposing to pay the EE providers.").

from any such rules [enabling energy efficiency provider to receive RPM capacity payments] must be just and reasonable.”⁶⁹ Given the nascent energy efficiency concept at the time, the Commission also directed “PJM to explore with its stakeholders” the appropriate duration of RPM capacity payments to energy efficiency providers.⁷⁰

As noted above, the early load forecasting methods used by PJM to model energy efficiency capability created an approximately four-year lag between an energy efficiency project’s installation and the inclusion of the energy efficiency project in the PJM Load Forecast. This lag was a significant factor in the Commission’s 2009 order accepting PJM’s proposal to permit energy efficiency providers to participate in the RPM.

More specifically, the Commission reasoned that PJM’s proposal to permit Energy Efficiency Resources to be offered into the capacity market would “correct[] a mismatch between [energy efficiency]-related load reductions and capacity requirement levels”⁷¹ created by the “four year lag after an [energy efficiency] resource is initially installed before its load-reducing effects are reflected in PJM’s load forecast and the associated installed reserve requirement for the Delivery Year.”⁷² The Commission further reasoned that PJM had shown “that as a result of the lag in load forecasting” that existed at the time, “[energy efficiency] resources [were] not completely represented in the four years for

⁶⁹ *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at P 137.

⁷⁰ *Id.*

⁷¹ *Id.* at P 132.

⁷² *Id.*

which PJM [was] proposing to pay the [energy efficiency] providers.”⁷³ A “result of not including the [energy efficiency] in the load forecast,” the Commission reasoned, was an “increas[e] in the price paid and capacity acquired compared with a load forecast that correctly included [energy efficiency].”⁷⁴ Thus, the Commission concluded, it could not find PJM’s proposal to permit energy efficiency to receive up to four years of capacity payments unreasonable.⁷⁵

2. *PJM Made Load Forecast Modeling Enhancements in 2016.*

Beginning in 2016, PJM improved the peak load forecast by developing an end-use intensity modeling methodology that directly captured the impact of energy efficiency projects.⁷⁶ Reliance on forward-looking end-use intensities eliminated the four-year lag between the installation of an energy efficiency project and its reflection in the peak load forecast.⁷⁷ End-use intensity modeling more accurately captures the impact of energy efficiency measures on forecasted demand.⁷⁸ As relevant here, the result of this fundamental change in modeling is that it was no longer reasonable to claim that energy efficiency was not already reflected in the peak load forecast.⁷⁹

⁷³ *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at P 134.

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ Gledhill Aff. ¶¶ 18-19.

⁷⁷ *Id.* ¶ 19.

⁷⁸ *Id.*

⁷⁹ *Id.* ¶¶ 30-31.

3. *PJM Adopts an Addback to Avoid Double-Counting the Impact of the Energy Efficiency Reductions on the Total Amount of Capacity Procured.*

If, as the Commission reasoned in 2009, *not* including energy efficiency capability in the load forecast increases the price paid and capacity acquired compared to a load forecast that correctly includes energy efficiency capability,⁸⁰ it follows that PJM’s current practice of *correctly including* energy efficiency in the load forecast would *decrease* the price paid and capacity acquired and thus allow energy efficiency providers to obtain the full economic benefit of their investment through a reduction in their capacity bills.⁸¹ In short, through enhanced forward-looking load forecasting, PJM now includes projected energy efficiency on the demand side on a forward basis for each RPM Auction.

Nevertheless, PJM sought to accommodate continued Energy Efficiency Resource participation in the capacity market.⁸² To do so, PJM and its stakeholders agreed to an “addback” (the mechanics of which are discussed next) to permit Energy Efficiency Resources to continue participating in—and being paid through—the capacity markets

⁸⁰ *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at P 134 (“PJM, however, has shown that as a result of the lag in load forecasting, EE resources are not completely represented in the four years for which PJM is proposing to pay the EE providers. As a result of not including the EE in the load forecast, the VRR curve fails to move to the left, increasing the price paid and capacity acquired compared with a load forecast that correctly included EE.”).

⁸¹ *See id.*

⁸² *See* Jeff Bastian, *M18 and M18B Revisions to Accommodate EE Resource Participation in RPM When EE Is Reflected in the Peak Load Forecast*, PJM Interconnection, L.L.C., 6 (Nov. 19, 2015), <https://www.pjm.com/-/media/committees-groups/committees/mrc/20151119/20151119-item-03b-draft-manual-18-and-18b-revisions-presentation.ashx>; Jeff Bastian, *M18 and M18B Revisions to Accommodate EE Resource Participation in RPM When EE is Reflected in the Peak Load Forecast*, PJM Interconnection, L.L.C., 3 (Dec. 17, 2015), <https://pjm.com/-/media/committees-groups/committees/mrc/20151217/20151217-item-04-draft-manual-18-and-18b-revisions-presentation.ashx>.

even though energy efficiency capability was already reflected in the PJM Load Forecast. The addback has been the only issue that PJM and stakeholders have revisited regarding the Energy Efficiency Resource participation rules since its inception in 2009. That said, the addback was not so much the product of a substantive review of these rules as it was an effort to preserve the status quo energy efficiency participation paradigm. In other words, the addback permitted Energy Efficiency Resources to continue to be offered in the capacity market (i.e., to continue receiving compensation on the supply side) even after improvements to energy efficiency modeling meant that energy efficiency capability was reflected in the PJM Load Forecast (i.e., on the demand side).⁸³

C. While the Addback Addressed Double Counting Issues, It Resulted in PJM Procuring Energy Efficiency Resources that Receive Capacity Payments Even Though They Cannot Be Counted Toward Meeting the Reliability Requirement.

As discussed above, since 2016, energy efficiency adoption is already considered on the *demand side* of RPM Auctions in the form of a lower peak load forecast. These same megawatts cannot be allowed to also clear on the *supply side* and contribute toward meeting the region's reliability needs, which already reflects a reduced peak load forecast. Thus, since 2016, to preserve the ability of energy efficiency providers to participate in the capacity market, PJM has been compelled to rely on an addback to avoid double counting.

Allowing a megawatt to be double counted—once on the demand side and again on the supply side—would create reliability problems.⁸⁴ To understand how reliability

⁸³ Similarly, the addback allowed FRR Entities to include Energy Efficiency Resources in their FRR Capacity Plans.

⁸⁴ See Gledhill Aff. ¶¶ 38-42.

problems would arise if the same energy efficiency megawatts were to be double counted, it is important to understand how RPM Auctions—the means by which PJM procures capacity to maintain resource adequacy and reliability—work.

In an RPM Auction, the megawatt quantity of capacity procured and the price paid to those resources (by load) is determined by the intersection of the supply curve (composed of offers to provide capacity) and the demand curve (the Variable Resource Requirement (“VRR”) Curve). The VRR Curve is administratively determined as a set of lines connecting several price-quantity points that are stated as multiples or fractions of the Cost of New Entry (on the vertical, price axis) and the target reliability requirement⁸⁵ (on the horizontal, megawatt-quantity axis). The target reliability requirement is the megawatt quantity of capacity needed to maintain reliability, and PJM’s load forecast is the basis of the target reliability requirement.⁸⁶

When the treatment of energy efficiency projects in the capacity market is reduced to its most basic mathematical components, it becomes readily apparent that the addback effectively adds additional steps to PJM’s capacity procurement process in order to allow energy efficiency providers to continue to be paid in PJM’s capacity market (on the supply side) despite the fact that energy efficiency is already included in the PJM Load Forecast

⁸⁵ Tariff, Attachment DD, section 5.10(a)(i).

⁸⁶ That is, to determine the target reliability requirement, PJM starts with the applicable load forecast and adjusts it by the Forecast Pool Requirement. *See, e.g.,* Tariff, Definitions O-P-Q (“‘PJM Region Reliability Requirement’ shall mean, for purposes of the Base Residual Auction, the Forecast Pool Requirement multiplied by the Preliminary PJM Region Peak Load Forecast, less the sum of all Preliminary Unforced Capacity Obligations of FRR Entities in the PJM Region; and, for purposes of the Incremental Auctions, the Forecast Pool Requirement multiplied by the updated PJM Region Peak Load Forecast, less the sum of all updated Unforced Capacity Obligations of FRR Entities in the PJM Region.”).

(on the demand side). In short, load is paying capacity prices for Energy Efficiency Resources with no corresponding benefit.

A simplified example, below, demonstrates how energy efficiency capability was accounted for both *before* (Scenario 1) and *after* (Scenario 2) energy efficiency modeling enhancements were incorporated into the PJM Load Forecast in 2016. For purposes of this example, in both scenarios, assume energy efficiency projects contribute 50 MW in load reduction (i.e., 50 EE MW), and that the goal is to obtain 1,000 MW through a combination of energy efficiency and the capacity markets.

- **Scenario 1 (2009-2015):**

Before the 2016 improvements to load forecast modeling, the PJM Load Forecast, on which the amount of capacity that the RPM needed to procure for reliability was based, did not account for energy efficiency capability. Therefore:

Reliability Requirement	RPM Cleared MW
1000 MW	1000 MW

Because energy efficiency capability was *not* reflected in the PJM Load Forecast (i.e., on the demand side), the impact of energy efficiency (i.e., 50 MW reduction) was accounted for through the capacity market (i.e., on the supply side). Thus, in the auction 50 EE MW could clear and be counted toward meeting the reliability requirement without any double counting:

Reliability Requirement	RPM Cleared MW
1000 MW	50 MW EE 950 MW of Generation and Demand Resources Total Cleared MW = 1000 MW

- **Scenario 2 (2016-Present):**

Beginning in 2016, modeling improvements enabled the load-reducing impact of energy efficiency capability to be reflected in the PJM Load Forecast, which was the basis for the amount of capacity that would need to be procured in the RPM. As a result, the reliability requirement is reduced by the 50 EE MW to 950 MW (i.e., $1000 \text{ MW} - 50 \text{ MW} = \mathbf{950 \text{ MW}}$).

But even though PJM's peak load forecast already includes the projected net impacts of energy efficiency actions in the PJM Load Forecast—which could then be relied on to determine the amount of capacity needed through the RPM without further adjustments to account for the contributions of energy efficiency providers—there was a desire to accommodate energy efficiency provider participation in the RPM. To accommodate this desire, PJM and its stakeholders recognized that if energy efficiency providers were permitted to participate in the capacity markets, those energy efficiency megawatts would be double-counted—once through the reduction reflected in the PJM Load Forecast (i.e., on the demand side) and again in reduction to the capacity needed to be procured through the capacity market (i.e., on the supply side). Improper double-counting would result in a shortfall in the capacity procured through RPM:

Reliability Requirement	RPM Cleared MW
950 MW (1000 – 50 EE MW)	50 MW EE 900 MW of Generation and Demand Resources Total Cleared MW = 950 MW, but only 900 MW of capacity not already included in the Reliability Requirement

While the Total Cleared MW equals the reliability requirement, this ignores that *the same* 50 MW of energy efficiency capability both were already used to reduce the reliability requirement *and* then were counted again toward meeting the reliability requirement. Thus, the signal would have been that the market only needs to procure resources to serve 900 MW (1,000 MW less 50 MW energy efficiency resulted in a reliability requirement of 950 MW, as reflected in the load forecast, *less the same* 50 MW of Energy Efficiency Resources, resulting in 900 MW). Double counting the same 50 MW of energy efficiency capability effectively shifts the VRR Curve by 50 MW to the left on the x-axis.⁸⁷ Such a shift in the VRR Curve could result in PJM failing to procure sufficient capacity to maintain reliability, which is demonstrated by this example of PJM only procuring 900 MW to meet a 950 MW reliability requirement. Mr. Gledhill provides additional detail in his affidavit.⁸⁸

To correct for this, PJM adopted the addback mechanism by which Energy Efficiency Resources were allowed to continue participating in the market without

⁸⁷ See Gledhill Aff. ¶ 41.

⁸⁸ See Gledhill Aff. ¶¶ 36-42.

double-counting their contribution and causing a reliability issue. Implementation of the addback requires that, for each megawatt of Energy Efficiency Resources that clears an RPM Auction, PJM adds that megawatt back to the reliability requirement. In short, the addback means that the same megawatts of generation and Demand Resources clear the auction regardless of the megawatts of Energy Efficiency Resources that clear the auction. Stated another way, regardless of the megawatts of Energy Efficiency Resources that clears, PJM must procure the same megawatts of generation or Demand Resources:

Reliability Requirement	RPM Cleared MW (With Addback)
950 MW (1000 – 50 EE MW)	50 MW EE 950 MW of Generation and Demand Resources Total cleared MW = 1000 MW

The addback thus allowed Energy Efficiency Resources to participate in the RPM, maintaining the participation status quo, while procuring Energy Efficiency Resources that were paid the clearing price even though they could not count toward meeting the reliability requirement. In short, since the inception of the addback mechanism, Energy Efficiency Resources, as shown in the example above, do not contribute to meeting the Reliability Requirement and may not serve as a substitute for any committed Capacity Resource.

III. THE PROPOSED REVISIONS TO THE TARIFF ARE JUST AND REASONABLE

A. *PJM Proposes Revisions to the Tariff and RAA to Prospectively Sunset the Participation of Energy Efficiency Resources in the Capacity Market.*

The proposed Tariff and RAA revisions to sunset Energy Efficiency Resources from PJM’s capacity market are fairly straightforward. The rules governing the participation of Energy Efficiency Resources are set forth in RAA, Schedule 6, section L (and the corresponding section of Tariff, Attachment DD-1), including the rules for how a project may qualify as an Energy Efficiency Resource and be eligible to be offered into an RPM Auction. PJM proposes to add a proviso at the beginning of section L stating that these rules are “effective only through the 2025/2026 Delivery Year” and “no Energy Efficiency Resources shall qualify to be offered into the RPM Auctions beginning with the 2026/2027 Delivery Year.”⁸⁹ The proposed proviso respects results of the Base Residual Auction for the 2025/2026 Delivery Year and the filed-rate doctrine for auctions that have already concluded. Thus, this approach would not require undoing or re-running that auction, while also recognizing that PJM’s peak load forecast already accounts for the energy efficiency capability in the PJM Region and therefore eliminates the need for PJM to clear and pay for any future Energy Efficiency Resources.

⁸⁹ Proposed Tariff, Attachment DD-1, section L.1; proposed RAA, Schedule 6, section L.1.

B. Because Energy Efficiency Capability in the PJM Region Is Accounted for in the Load Forecast (Demand Side), It Is Just and Reasonable to Sunset Energy Efficiency Resource Participation in the Capacity Market (Supply Side).

As demonstrated above and in Mr. Gledhill's affidavit, PJM's load forecast, which is based on industry best practices and reviewed by stakeholders and independent consultants, captures the PJM Region's energy efficiency adoption. It would not be just and reasonable to allow a megawatt of energy efficiency capability to be double counted, i.e., on both the supply side and the demand side. Such double counting would present reliability problems, as PJM would under-procure sufficient capacity to meet applicable reliability standards.⁹⁰ There are three ways to address this issue.

1. Carving Out Energy Efficiency Adoption from the Load Forecast Is Infeasible and Would Result in Under-Representing the PJM Region's Energy Efficiency Adoption.

One way would be to carve out the region's energy efficiency capability from the load forecast to allow Energy Efficiency Resources to clear and be counted toward the reliability requirement. In other words, under this approach, PJM would have to create a counterfactual load forecast that assumes end-use customers are not adopting energy efficiency measures and then subsequently adjust that forecast. However, this approach is simply a non sequitur under PJM's current, end-use intensity-based and top down aggregate load forecasting methodology. Indeed, because much of the PJM Region's energy efficiency adoption occurs either naturally through end-use customers purchasing more electrically efficient items or through the imposition of updated, stricter energy

⁹⁰ PJM maintains reliability through procuring sufficient capacity to meet the 1-day-in-10 loss of load expectation resource adequacy standard.

efficiency standards, omitting energy efficiency projects from the load forecast, even with a methodological change, would be difficult, if not impossible. It would require PJM to ignore the forward-looking EIA data on energy efficiency penetration and instead forecast a fictional world where there is little if any independent trend toward adoption of energy efficiency measures by customers in response to the electric bills they receive.

Moreover, such an approach is problematic and would only be just and reasonable if *all* energy efficiency capability were to offer into and clear the capacity auctions for a given Delivery Year. Otherwise, the reliability requirement would overstate the amount of capacity PJM needs to procure to maintain reliability because it would not account for all energy efficiency adoption. Such overstatement would, in turn, unnecessarily increase the amount of capacity PJM would need to procure, with a concomitant increase in the cost to load for the capacity the region does not actually need. Such an approach would be unjust and unreasonable, and would directly conflict with industry best practices to produce an aggregate electricity forecast.

2. *Maintaining the Addback Would Perpetuate Paying Capacity Rates to Resources that Do Not Provide Capacity When There Is No Causal Link Between the Capacity Payments and the Underlying Reduction in Energy Consumption.*

A second way to address the issue would be for PJM to continue the status quo and apply an addback mechanism to prevent double counting by “reconstitut[ing] (i.e., add[ing] back) load reductions from supply side [Energy Efficiency Resources] to its forecasted demand curve” during the auction clearing process.⁹¹ This is the approach PJM and

⁹¹ *Advanced Energy Econ.*, 161 FERC ¶ 61,245, at P 7 (2017).

stakeholders previously took, as a corresponding move to PJM's changes to its load forecast methodology, in order to allow Energy Efficiency Resources to continue to participate in RPM Auctions.

In 2011, the Commission and PJM dealt with a similar double-counting issue with Demand Resources. There, end use-customers received the benefit of lower capacity costs through a reduced peak load contribution but were also paid for the exact same load reduction.⁹² The Commission found "reliability concerns" associated with Demand Resources not dropping below their peak load contribution because "there [would be] more load on the PJM system than was anticipated when capacity resources were procured in the capacity auctions."⁹³ Thus, to "draw[] a necessary link between capacity resource performance and procurement to ensure system reliability,"⁹⁴ the Commission found just and reasonable PJM's proposal to require the amount of capacity a Demand Resource can offer to be keyed off of the resource's "peak load contribution."⁹⁵ In short, to be just and reasonable, load reductions that could be offered into and clear the market must be reductions *off the load forecast*. Otherwise, the Demand Resources were not actually providing any capacity.

While the addback approach addresses this double counting issue by not letting cleared Energy Efficiency Resources count as capacity toward meeting the reliability requirement, this approach is fundamentally at odds with the notion that resources being

⁹² *PJM Interconnection, L.L.C.*, 137 FERC ¶ 61,108, at P 66 (2011).

⁹³ *Id.* at P 67.

⁹⁴ *Id.* at P 74.

⁹⁵ *Id.* at P 64.

paid capacity rates should actually provide capacity. Indeed, the addback approach calls for load to pay capacity rates for the load reduction that would naturally occur and from which load is already receiving the benefit through the reduced load forecast (and, in turn, reduced reliability requirement). The addback does not correct for this, because, as demonstrated above, to avoid the double counting reliability issue, PJM must procure the same megawatt amount of other Capacity Resources that do contribute toward meeting the reliability requirement. That is, the amount of Energy Efficiency Resources that clear an RPM Auction is immaterial; PJM still needs to procure sufficient megawatt quantities of the other Capacity Resource types to meet the reliability requirement in order to maintain reliability.

3. *A Much More Effective Market Design Is to Consider the Benefits of Energy Efficiency-Related Reductions in Energy Consumption Only on the Demand Side, Through the Load Forecast.*

A third way to address the issue is for PJM to only consider the region's energy efficiency capability in the load forecast and no longer allow Energy Efficiency Resources to participate on the demand side of the capacity market (and remove the addback mechanism). Under this approach, Energy Efficiency Resources would not be permitted to clear an RPM Auction or be counted toward meeting the Reliability Requirement. There would be no energy efficiency projects that could support an Energy Efficiency Resource, as all such capability would be deemed to be considered in the PJM Load Forecast, and as the definition of Energy Efficiency Resource requires that it cannot be supported by a load

reduction “reflected in the peak load forecast.”⁹⁶ This is the approach PJM is proposing in this proceeding.

Under this third (and PJM’s proposed) approach, the reliability requirement would reflect the expected demand for the Delivery Year (including the load reductions from energy efficiency projects) and the double counting issue is avoided. There is thus no need for an addback. In addition, the capacity rates are just and reasonable because they only compensate resources to the extent they contribute capacity toward meeting the reliability requirement.

Further, participation of energy efficiency as a supply-side resource is not required for a capacity market to be just and reasonable. The Commission accepted PJM’s RPM market design without requiring energy efficiency to participate, and rejected a request for rehearing on this issue.⁹⁷ Recently, the Commission rejected calls for the Commission to require New York Independent System Operator, Inc. to allow energy efficiency resources to participate as supply side resources in its capacity market—as part of a distributed energy resource.⁹⁸

⁹⁶ See RAA, Article 1 – Definitions (Energy Efficiency Resource); RAA, Schedule 6, section L.1; Tariff, Attachment DD-1, section L.1.

⁹⁷ See *PJM Interconnection, L.L.C.*, 119 FERC ¶ 61,318, at PP 198-204 (2007).

⁹⁸ See *N.Y. Indep. System Operator, Inc.*, 179 FERC ¶ 61,198, at P 112 (“[W]e agree with NYISO that it should not be required to change its capacity market qualification requirements to enable energy efficiency resources (or any other resource type that currently does not qualify) to participate in NYISO’s capacity market.”), *order on reh’g*, 181 FERC ¶ 61,054 (2022).

C. It Is Just and Reasonable for Load to Not Have to Pay for Energy Efficiency Which Lack a Causal Link to Increased Reliability or Lower Costs.

Just and reasonable rates must comply with cost causation principles.⁹⁹ Under the “beneficiary pays” cost causation standard, customers only pay for facilities (including resources) or services from which they obtain benefit.¹⁰⁰ Thus, to the extent a resource does not provide benefit (e.g., it is not used and useful in providing service), customers should not be required to pay for such resources.¹⁰¹ Application of this elemental principle here supports the conclusion that Energy Efficiency Resources that clear an RPM Auction should no longer be compensated at the capacity market clearing price.¹⁰² The capacity market clearing price represents the cost of the capacity procured to meet resource adequacy and reliability standards.¹⁰³ But, given that Energy Efficiency Resources do not contribute toward the reliability requirement without giving rise to reliability concerns, Energy Efficiency Resources do not provide capacity. Moreover, it is unclear what service

⁹⁹ See, e.g., *Old Dominion Elec. Coop. v. FERC*, 898 F.3d 1254, 1255 (D.C. Cir. 2018) (“For decades, the Commission and the courts have understood [the just and reasonable rate] requirement to incorporate a ‘cost causation principle’—the rates charged for electricity should reflect the costs of providing it.”).

¹⁰⁰ See *Building for the Future Through Regional Transmission Planning and Cost Allocation*, Order No. 1920, 187 FERC ¶ 61,068, at P 8 (2024) (noting that “the beneficiary pays requirement [] is the foundation of cost causation under the FPA’s just and reasonable standard”), *appeals pending*, Petition for Review, *Appalachian Voices v. FERC*, Nos. 24-1650, et al. (4th Cir. July 16, 2024).

¹⁰¹ See, e.g., *New England Power Co.*, Opinion No. 295, 42 FERC ¶ 61,016, at 61,078 (“In general, the used and useful standard provides that an asset may be included in a utility’s rate base only when the item is used and useful in providing service,” because “current ratepayers should bear only the costs incurred in providing service to them.” (citing *NEPCO Mun. Rate Comm. v. FERC*, 668 F.2d 1327, (D.C. Cir. 1981))), *order on reh’g*, Opinion No. 295-A, 43 FERC ¶ 61,285 (1988).

¹⁰² PJM generally agrees with the Commission’s policy against re-running auctions and does not seek to upend the results of past auctions or unsettle existing commitments. PJM argues only that, going forward, compensating Energy Efficiency Resources at the capacity clearing price would be unjust and unreasonable.

¹⁰³ See *PJM Interconnection, L.L.C.*, 119 FERC ¶ 61,318, at P 192.

or product Energy Efficiency Resources are being compensated for through the capacity market. As demonstrated, Energy Efficiency Resources are not providing capacity (i.e., they are not counted toward meeting the Reliability Requirement) in return for capacity payments and the capacity payments are not resulting in further energy efficiency adoption.

D. Capacity Payments for Energy Efficiency Resources Do Not Drive Investment in Energy Efficiency Projects.

There is no causal link between the growth in actual energy efficiency capability and the revenue received from the PJM capacity market. The capacity market rules do not explicitly require a showing that capacity payments to Energy Efficiency Resources actually effectuate any reduction in energy consumption, and despite calls for Energy Efficiency Resource sellers to provide any such causal link, certain sellers have steadfastly refused to do so.¹⁰⁴

Rather, the proliferation of energy efficiency projects in the PJM Region is entirely unrelated to capacity payments. Much of the energy efficiency occurring in the PJM Region is occurring either naturally through end-use customers purchasing more electrically efficient items, or through the continued adoption at the state and local levels of updated and stricter energy efficiency standards.¹⁰⁵ Generally, the remainder of energy efficiency adoption is the product of utility and residential programs, carried out in

¹⁰⁴ See *Independent Market Monitor for PJM v. Indicated Energy Efficiency Sellers*, Answer of Affirmed Energy LLC to Complaint of the Independent Market Monitor for PJM, Docket No. EL24-113-000, at 6-9 (July 22, 2024).

¹⁰⁵ For example, if an end-use customer buys a refrigerator that is Energy Star certified at a big box store, and an Energy Efficiency Resource seller purchases receipts from the big box store, the Energy Efficiency Resource seller did not effectuate the purchase of the Energy Star refrigerator.

accordance with applicable state agency directives. In fact, several utility members that currently offer Energy Efficiency Resources into PJM's capacity market indicated that they will continue to incentivize energy efficiency projects through state-sponsored retail programs during the course of several PJM stakeholder meetings.¹⁰⁶

E. Load Obtains the Greatest Amount of Energy Efficiency's Benefits Through PJM's Proposal.

Through the adoption of energy efficiency programs and the installation of more energy efficiency products, load serving entities and their consumers accrue the benefits of lower capacity costs. This is because their capacity costs are typically based on the end-use customer specific peak load contributions, which are, in turn, typically based on actual retail consumption during PJM's peak periods. Stated another way, because PJM's peak load forecast intrinsically accounts, on a forward-looking basis, for energy efficiency capability, the total amount of capacity procured through the RPM is lower. The result, all else being equal, is lower wholesale capacity market prices and lower overall costs (e.g., lower capacity price x lower peak load contribution = lower capacity cost). Thus, load serving entities and their customers already receive the benefit of lower capacity bills resulting from lower energy consumption. This reduction in wholesale and retail costs acts as an incentive for load to continue to adopt energy efficiency measures.

¹⁰⁶ See Alex Stern, *Exelon EE Package Proposal*, Exelon Corp. (Aug. 7, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240807/20240807-item-02a-1---ee-resource-evaluation-exelon-proposal---presentation.ashx> ("No matter what happens at PJM, state EE programs themselves would not be gone. They will still play a vital and appropriate role within each state and contribute on the load forecasting side at PJM.").

In addition, other benefits accrue to load through energy efficiency adoption, and PJM's proposed approach allows the PJM Region to obtain the *maximum* benefit from the energy efficiency capability in the PJM Region, while maintaining reliability. Energy efficiency projects provide numerous and cascading benefits:

- By accounting for the permanent reduction in energy consumption in the load forecast, the capacity market will set the reliability requirement lower than it would have been absent such projects;
- The lower reliability requirement results in less capacity procured to maintain reliability;
- Less capacity procured, all else equal, will result in lower capacity rates paid by load;
- The lower reliability requirement also means that the PJM Region will need fewer new resources to accommodate the energy transition (while maintaining reliability);
- Fewer new resources interconnecting to the grid, reducing queue congestion and complexity, and, all else being equal, reducing interconnection and transmission buildout costs;
- Consumers implementing energy efficiency projects will receive the benefit of lower capacity costs by a reduced load forecast for their zone;
- Individual end-use customers will realize a lower peak load contribution from their respective load serving entity, which in turn reduces their specific capacity costs; and
- Individual end-use customers that install energy efficiency will continue to realize the benefits of reduced energy costs.

PJM's proposal to capture energy efficiency capability through the PJM Load Forecast maximizes these benefits by recognizing the greatest amount of energy efficiency capability possible without resulting in double counting and creating reliability concerns absent the use of an addback mechanism. These benefits accrue *directly* to customers through lower capacity charges and reduced energy consumption. To continue capacity

payments to Energy Efficiency Resources though the addback mechanism thwarts the savings by charging customers for efficiency measures that are already, and will continue to be, adopted independent of receiving wholesale capacity market revenues. As demonstrated above, the other approaches are fraught with fatal problems that prevent them from maximizing the benefits energy efficiency can offer to load serving entities.

IV. STAKEHOLDER PROCESS

PJM stakeholders initiated a holistic review of Energy Efficiency Resources participating within PJM's RPM Auctions in November of 2023. Thereafter, there were numerous meetings, including several special sessions of the Markets and Implementation Committee, where stakeholders provided various views and proposals to amend the existing participation of Energy Efficiency Resources in PJM's wholesale markets. The Market Monitor raised numerous structural concerns, including energy efficiency being accounted for on both the supply and the demand side, as it had previously raised in its State of the Market Reports.¹⁰⁷ The Market Monitor raised these concerns in the stakeholder process and presented this proposal there. Ultimately, these meetings culminated in the instant proposal, which was endorsed by a sector-weighted majority of PJM's stakeholders at the MRC and the MC on August 21, 2024. Thereafter, the PJM

¹⁰⁷ See, e.g., *2023 State of the Market Report for PJM*, Monitoring Analytics, LLC, section 1, page 38 (Mar. 14, 2024), https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2023/2023-som-pjm-sec1.pdf ("The MMU recommends that Energy Efficiency Resources (EE) not be included in the capacity market because PJM's load forecasts have accounted for EE since the 2016 load forecast for the 2019/2020 delivery year, and the tariff rationale for inclusion no longer exists. (Priority: Medium. First reported 2016. Status: Not adopted.)" (footnote omitted)).

Board approved the proposed amendments to the RAA in accordance with RAA, section 16.4 on August 26, 2024.

V. PROPOSED EFFECTIVE DATE

PJM requests an effective date of November 6, 2024, for the proposed Tariff and RAA revisions described herein. PJM also requests that the Commission issue an order accepting this filing on the same day (November 6, 2024) without delay. An order by this date is necessary to provide certainty and clarity as to the eligibility of Energy Efficiency Resources sufficiently in advance of the Base Residual Auction associated with the 2026/2027 Delivery Year, which is scheduled to commence on December 4, 2024.

Should this date not be met, PJM would be forced to continue with the current rules for energy efficiency for the upcoming December Base Residual Auction for the 2026/2027 Delivery Year. Although it could do so, the costs of allowing energy efficiency to continue to participate are considerable and rising. In the 2026/2027 Base Residual Auction, Energy Efficiency Resource sellers, in aggregate, cleared 1,460 MW, which will receive capacity payments of approximately \$144 million, which would be a record high level.¹⁰⁸ PJM and the sector-weighted majority of its membership believe that reform to the current energy efficient protocols in PJM is now promptly needed pursuant to the Commission's well-recognized section 205 standard.

¹⁰⁸ While the total megawatts of Energy Efficiency Resources that cleared the Base Residual Auction for the 2025/2026 Delivery Year was smaller than for the prior Delivery Year, the significant increase in the auction clearing price will result in Energy Efficiency Resources realizing record revenues for a given Delivery Year.

VI. DESCRIPTION OF SUBMITTAL

This filing consists of the following:

1. This transmittal letter;
2. Attachment A - Revised sections of the Tariff and RAA (redlined version);
3. Attachment B - Revised sections of the Tariff and RAA (clean version);
and
4. Attachment C - Affidavit of Andrew Gledhill on Behalf of PJM Interconnection, L.L.C.

VII. CORRESPONDENCE

The following individuals are designated for inclusion on the official service list in this proceeding and for receipt of any communications regarding this filing:

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VIII. SERVICE

PJM has served a copy of this filing on all PJM Members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,¹⁰⁹ PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <https://www.pjm.com/library/filing-order> with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM Members and all state utility regulatory commissions in the PJM Region¹¹⁰ alerting them that this filing has been made by PJM and is available by following such link. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within 24 hours of the filing. Also, a copy of this filing will be available on the FERC's eLibrary website located at the following link: <http://www.ferc.gov/docs-filing/elibrary.asp> in accordance with the Commission's regulations and Order No. 714.

¹⁰⁹ See 18 C.F.R §§ 35.2(e) & 385.2010(f)(3).

¹¹⁰ PJM already maintains, updates and regularly uses e-mail lists for all PJM Members and affected state commissions.

IX. CONCLUSION

For the reasons discussed herein, PJM respectfully requests that the Commission, accept the proposed amendments to the Tariff and RAA, effective November 6, 2024, which is 61 days from the date of this filing.

Respectfully submitted,

/s/ Ryan J. Collins

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September 6, 2024

Attachment A

Revisions to the
PJM Open Access Transmission Tariff and
PJM Reliability Assurance Agreement
(Identified by Additional Cover Pages)
(Marked/Redline Format)

PJM Open Access Transmission Tariff
(Marked/Redline Format)

ATTACHMENT DD-1

Preface: The provisions of this Attachment incorporate into the Tariff for ease of reference the provisions of Schedule 6 of the Reliability Assurance Agreement among Load Serving Entities in the PJM Region. As a result, this Attachment will be modified, subject to FERC approval, so that the terms and conditions set forth herein remain consistent with the corresponding terms and conditions of RAA, Schedule 6. Capitalized terms used herein that are not otherwise defined in Tariff, Attachment DD or elsewhere in this Tariff have the meaning set forth in the RAA.

PROCEDURES FOR DEMAND RESOURCES AND ENERGY EFFICIENCY

A. Parties can partially or wholly offset the amounts payable for the Locational Reliability Charge with Demand Resources that are operated under the direction of the Office of the Interconnection. FRR Entities may reduce their capacity obligations with Demand Resources that are operated under the direction of the Office of the Interconnection and detailed in such entity's FRR Capacity Plan. Demand Resources qualifying under the criteria set forth below may be offered for sale or designated as Self-Supply in the Base Residual Auction, included in an FRR Capacity Plan, or offered for sale in any Incremental Auction, for any Delivery Year for which such resource qualifies. Qualified Demand Resources generally fall in one of two categories, i.e., Guaranteed Load Drop or Firm Service Level, as further specified in section G below and the PJM Manuals. Qualified Demand Resources may be provided by a Curtailment Service Provider, notwithstanding that such Curtailment Service Provider is not a Party to this Agreement. Such Curtailment Service Providers must satisfy the requirements hereof and the PJM Manuals.

1. A Party must formally notify, in accordance with the requirements of the PJM Manuals and section F hereof, as applicable, the Office of the Interconnection of the Demand Resource Registration that it is placing under the direction of the Office of the Interconnection. A Party must further notify the Office of the Interconnection whether the Demand Resource Registration is linked to a Summer-Period Demand Resource or an Annual Demand Resource.

2. A Demand Resource Registration must achieve its full load reduction within the following time period:

(a) For the 2015/2016 Delivery Year and subsequent Delivery Years, a Demand Resource Registration must be able to fully respond to a Load Management Event within 30 minutes of notification from the Office of the Interconnection. This default 30 minute prior notification shall apply unless a Curtailment Service Provider obtains an exception from the Office of the Interconnection due to physical operational limitations that prevent the Demand Resource Registration from reducing load within that timeframe. In such case, the Curtailment Service Provider shall submit a request for an exception to the 30 minute prior notification requirement to the Office of the Interconnection, at the time the Registration Form for that Demand Resource Registration is submitted in accordance with Tariff, Attachment K-Appendix. The only alternative notification times that the Office

of Interconnection will permit, upon approval of an exception request, are 60 minutes and 120 minutes prior to a Load Management Event. The Curtailment Service Provider shall indicate in writing, in the appropriate application, that it seeks an exception to permit a prior notification time of 60 minutes or 120 minutes, and the reason(s) for the requested exception. A Curtailment Service Provider shall not submit a request for an exception to the default 30 minute notification period unless it has done its due diligence to confirm that the Demand Resource Registration is physically incapable of responding within that timeframe based on one or more of the reasons set forth below and as may be further defined in the PJM Manuals and has obtained detailed data and documentation to support this determination.

In order to establish that a Demand Resource Registration is reasonably expected to be physically unable to reduce load in that timeframe, the Curtailment Service Provider that submitted the Demand Resource Registration must demonstrate that:

- (i) The manufacturing processes for the Demand Resource Registration require gradual reduction to avoid damaging major industrial equipment used in the manufacturing process, or damage to the product generated or feedstock used in the manufacturing process;
- (ii) Transfer of load to back-up generation requires time-intensive manual process taking more than 30 minutes;
- (iii) On-site safety concerns prevent location from implementing reduction plan in less than 30 minutes; or,
- (iv) The Demand Resource Registration is comprised of mass market residential customers or Small Commercial Customers which collectively cannot be notified of a Load Management Event within a 30-minute timeframe due to unavoidable communications latency, in which case the requested notification time shall be no longer than 120 minutes.

The Office of the Interconnection may request data and documentation from the Curtailment Service Provider and such Curtailment Service Provider shall provide to the Office of the Interconnection within three (3) Business Days of a request therefor, a copy of all of the data and documentation supporting the exception request. Failure to provide a timely response to such request shall cause the exception to terminate the following Operating Day.

At its sole option and discretion, the Office of the Interconnection may review the data and documentation provided by the Curtailment Service Provider to determine if the Demand Resource Registration has met one or more of the criteria above. The Office of the Interconnection will notify the Curtailment Service Provider in writing of its determination by no later than ten (10) Business Days after receipt of the data and documentation.

The Curtailment Service Provider shall provide written notification to the Office of the Interconnection of a material change to the facts that supported its exception request within three

(3) Business Days of becoming aware of such material change in facts, and, if the Office of Interconnection determines that the physical limitation criteria above are no longer being met, the Demand Resource Registration shall be subject to the default notification period of 30 minutes immediately upon such determination.

3. The initiation of load reduction, upon the request of the Office of the Interconnection, must be within the authority of the dispatchers of the Party. No additional approvals should be required.

4. The initiation of load reduction upon the request of the Office of the Interconnection is considered a pre-emergency or emergency action and must be implementable prior to a voltage reduction.

5. A Curtailment Service Provider intending to offer for sale or designate for self-supply, a Demand Resource in any RPM Auction, or intending to include a Demand Resource in any FRR Capacity Plan must demonstrate, to PJM's satisfaction, that such resource shall have the capability to provide a reduction in demand, or otherwise control load, on or before the start of the Delivery Year for which such resource is committed. As part of such demonstration, each such Curtailment Service Provider shall submit a Demand Resource Sell Offer Plan in accordance with the standards and procedures set forth in RAA, Schedule 6, section A-1; RAA, Schedule 8.1 (as to FRR Capacity Plans) and the PJM Manuals, no later than 30 days prior to, as applicable, the RPM Auction in which such resource is to be offered, or the deadline for submission of the FRR Capacity Plan in which such resource is to be included. PJM may verify the Curtailment Service Provider's adherence to the Demand Resource Sell Offer Plan at any time. A Curtailment Service Provider with a PJM-approved Demand Resource Sell Offer Plan will be permitted to offer up to the approved Demand Resource quantity into the subject RPM Auction or include such resource in its FRR Capacity Plan.

6. Selection of a Demand Resource in an RPM Auction results in commitment of capacity to the PJM Region. Demand Resources that are so committed must be linked to registrations participating in the Full Program Option or Capacity Only Option of the Emergency Load Response and Pre-Emergency Load Response Program and thus available for dispatch during PJM-declared pre-emergency events and emergency events.

A-1. A Demand Resource Sell Offer Plan shall consist of a completed template document in the form posted on the PJM website, requiring the information set forth below and in the PJM Manuals, and a Demand Resource Officer Certification Form signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification. The Demand Resource Sell Offer Plan must provide information that supports the Demand Resource Provider's intended Demand Resource Sell Offers and demonstrates that the Demand Resources are being offered with the intention that the MW quantity that clears the auction is reasonably expected to be physically delivered through Demand Resource registrations for the relevant Delivery Year. The Demand Resource Sell Offer Plan shall include all Existing Demand Resources and all Planned

Demand Resources that the Demand Resource Provider intends to offer into an RPM Auction or include in an FRR Capacity Plan.

1. Demand Resource Sell Offer Plan Template. The Demand Resource Sell Offer Plan template, in the form provided on the PJM website, shall require the Demand Resource Provider to provide the following information and such other information as specified in the PJM Manuals:

(a) Summary Information. The completed template shall include the Demand Resource Provider's company name, contact information, and the Nominated DR Value in ICAP MWs by Zone/sub-Zone that the Demand Resource Provider intends to offer, stated separately for Existing Demand Resources and Planned Demand Resources. The total Nominated DR Value in MWs for each Zone/sub-Zone shall be the sum of the Nominated DR Value of Existing Demand Resources and the Nominated DR Value of Planned Demand Resources, and shall be the maximum MW amount the Provider intends to offer in the RPM Auction for the indicated Zone/sub-Zone, provided that nothing herein shall preclude the Demand Resource Provider from offering in the auction a lesser amount than the total Nominated DR Value shown in its Demand Resource Sell Offer Plan.

(b) Existing Demand Resources. The Demand Resource Provider shall identify all Existing Demand Resources by identifying end-use customer sites that are currently registered with PJM (even if not registered by such Demand Resource Provider) and that the Demand Resource Provider reasonably expects to have under a contract to reduce load based on PJM dispatch instructions by the start of the auction Delivery Year.

(c) Planned Demand Resources. The Demand Resource Provider shall provide the details of, and key assumptions underlying, the Planned Demand Resource quantities (i.e., all Demand Resource quantities in excess of Existing Demand Resource quantities) contained in the Demand Resource Sell Offer Plan, including:

(i) key program attributes and assumptions used to develop the Planned Demand Resource quantities, including, but not limited to, discussion of:

- method(s) of achieving load reduction at customer site(s);
- equipment to be controlled or installed at customer site(s), if any;
- plan and ability to acquire customers;
- types of customer targeted;
- support of market potential and market share for the target customer base, with adjustments for Existing Demand Resource customers within this market and the potential for

other Demand Resource Providers targeting the same customers; and

- assumptions regarding regulatory approval of program(s), if applicable.

(ii) Zone/sub-Zone information by end-use customer segment for all Nominated DR Values for which an end-use customer site is not identified, to include the number in each segment of end-use customers expected to be registered for the subject Delivery Year, the average Peak Load Contribution per end-use customer for such segment, and the average Nominated DR Value per customer for such segment. End-use customer segments may include residential, commercial, small industrial, medium industrial, and large industrial, as identified and defined in the PJM Manuals, provided that nothing herein or in the Manuals shall preclude the Provider from identifying more specific customer segments within the commercial and industrial categories, if known.

(iii) Information by end-use customer site to the extent required by subsection A-1(1)(c)(iv) or, if not required by such subsection, to the extent known at the time of the submittal of the Demand Resource Sell Offer Plan, to include: customer EDC account number (if known), customer name, customer premise address, Zone/sub-Zone in which the customer is located, end-use customer segment, current Peak Load Contribution value (or an estimate if actual value not known) and an estimate of expected Peak Load Contribution for the subject Delivery Year, and an estimated Nominated DR Value.

(iv) End-use customer site-specific information shall be required for any Zones or sub-Zones identified by PJM pursuant to this subsection for the portion, if any, of a Demand Resource Provider's intended offer in such Zones or sub-Zones that exceeds a Sell Offer threshold determined pursuant to this subsection, as any such excess quantity under such conditions should reflect Planned Demand Resources from end-use customer sites that the Provider has a high degree of certainty it will physically deliver for the subject Delivery Year. In accordance with the procedures in subsection A-1(3) below, PJM shall identify, as requiring site-specific information, all Zones and sub-Zones that comprise any LDA group (from a list of LDA groups stated in the PJM Manuals) in which [the quantity of cleared Demand Resources from the most recent Base Residual Auction] plus [the quantity of Demand Resources included in FRR Capacity Plans for the Delivery Year addressed by the most recent Base Residual Auction] in any Zone or sub-Zone of such LDA group exceeds the greater of:

- the maximum Demand Resources quantity registered with PJM for such Zone for any Delivery Year from the current

(at time of plan submission) Delivery Year and the two preceding Delivery Years; and

- the potential Demand Resource quantity for such Zone estimated by PJM based on an independent published assessment of demand response potential that is reasonably applicable to such Zone, as identified in the PJM Manuals.

For each such Zone and sub-Zone, the Sell Offer threshold for each Demand Resource Provider shall be the higher of:

- the Demand Resource Provider's maximum Demand Resource quantity registered with PJM for such Zone/sub-Zone over the current Delivery Year (at the time of plan submission) and two preceding Delivery Years;
- the Demand Resource Provider's maximum for any single Delivery Year of [such provider's cleared Demand Resource quantity] plus [such provider's quantity of Demand Resources included in FRR Capacity Plans] from the three forward Delivery Years addressed by the three most recent Base Residual Auctions for such Zone/sub-Zone; and
- 10 MW.

(d) Schedule. The Demand Resource Provider shall provide an approximate timeline for procuring end-use customer sites as needed to physically deliver the total Nominated DR Value (for both Existing Demand Resources and Planned Demand Resources) by Zone/sub-Zone in the Demand Resource Sell Offer Plan. The Demand Resource Provider must specify the cumulative number of customers and the cumulative Nominated DR Value associated with each end-use customer segment within each Zone/sub-Zone that the Demand Resource Provider expects (at the time of plan submission) to have under contract as of June 1 each year between the time of the auction and the subject Delivery Year.

2. Demand Resource Officer Certification Form. Each Demand Resource Sell Offer Plan must include a Demand Resource Officer Certification, signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification, in the form shown in the PJM Manuals, which form shall include the following certifications:

(a) that the signing officer has reviewed the Demand Resource Sell Offer Plan and the information supplied to PJM in support of the Plan is true and correct as of the date of the certification;

(b) that the Sell Offer Plan does not include any Critical Natural Gas Infrastructure facilities, and

(c) that the Demand Resource Provider is submitting the Plan with the reasonable expectation, based upon its analyses as of the date of the certification, to physically deliver all megawatts that clear the RPM Auction through Demand Resource registrations by the specified Delivery Year.

As set forth in the form provided in the PJM Manuals, the certification shall specify that it does not in any way abridge, expand, or otherwise modify the current provisions of the PJM Tariff, Operating Agreement and/or RAA, or the Demand Resource Provider's rights and obligations thereunder, including the Demand Resource Provider's ability to adjust capacity obligations through participation in PJM incremental auctions and bilateral transactions.

3. Procedures. No later than December 1 prior to the Base Residual Auction for a Delivery Year, PJM shall post to the PJM website a list of Zones and sub-Zones, if any, for which end-use customer site-specific information shall be required under the conditions specified in subsection A-1(1)(c)(iv) above for all RPM Auctions conducted for such Delivery Year. Once so identified, a Zone or sub-Zone shall remain on the list for future Delivery Years until the threshold determined under subsection A-1(1)(c)(iv) above is not exceeded for three consecutive Delivery Years. No later than 30 days prior to the RPM Auction in which a Demand Resource Provider intends to offer a Demand Resource, the Demand Resource Provider shall submit to PJM a completed Demand Resource Sell Offer Plan template and a Demand Resource Officer Certification Form signed by a duly authorized officer of the Provider. PJM will review all submitted DR Sell Offer Plans. No later than 10 Business Days prior to the subject RPM Auction, PJM shall notify any Demand Resource Providers that have identified the same end-use customer site(s) in their respective DR Sell Offer Plans for the same Delivery Year. In such event, the MWs associated with such site(s) will not be approved for inclusion in a Sell Offer in an RPM Auction by any of the Demand Resource Providers, unless a Demand Resource Provider provides a letter of support from the end-use customer indicating that it is likely to execute a contract with that Demand Resource Provider for the relevant Delivery Year, or provides other comparable evidence of likely commitment. Such letter of support or other supporting evidence must be provided to PJM no later than 7 Business Days prior to the subject RPM Auction. If an end-use customer provides letters of support for the same site for the same Delivery Year to multiple Demand Resource Providers, the MWs associated with such end-use customer site shall not be approved as a Demand Resource for any of the Demand Resource Providers. No later than 5 Business Days prior to the subject RPM Auction, PJM will notify each Demand Resource Provider of the approved Demand Resource quantity, by Zone/sub-Zone, that such Demand Resource Provider is permitted to offer into such RPM Auction.

- B. The Unforced Capacity value of a Demand Resource will be determined as:
- (1) for Delivery Years through the 2024/2025 Delivery Year, as the product of the Nominated Value of the Demand Resource times the Forecast Pool Requirement. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.
- (2) for the 2025/2026 Delivery Year and subsequent Delivery Years, in accordance with RAA, Schedule 9.2. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.
- C. Demand Resources offered and cleared in a Base Residual or Incremental Auction shall receive the corresponding Capacity Resource Clearing Price as determined in such auction, in accordance with Tariff, Attachment DD. For Delivery Years beginning with the Delivery Year that commences on June 1, 2013, any Demand Resources located in a Zone with multiple LDAs shall receive the Capacity Resource Clearing Price applicable to the location of such resource within such Zone, as identified in such resource's offer. Further, the Curtailment Service Provider shall register its resource in the same location within the Zone as specified in its cleared sell offer, and shall be subject to deficiency charges under Tariff, Attachment DD to the extent it fails to provide the resource in such location consistent with its cleared offer.
- D. The Party, Electric Distributor, or Curtailment Service Provider that establishes a contractual relationship (by contract or tariff rate) with a customer for load reductions is entitled to receive the compensation specified in section C for a committed Demand Resource, notwithstanding that such provider is not the customer's energy supplier.
- E. Any Party hereto shall demonstrate that its Demand Resources performed during periods when load management procedures were invoked by the Office of the Interconnection. The Office of the Interconnection shall adopt and maintain rules and procedures for verifying the performance of such resources, as set forth in section K hereof and the PJM Manuals. In addition, committed Demand Resources that do not comply with the directions of the Office of the Interconnection to reduce load during an emergency shall be subject to the penalty charge set forth in Tariff, Attachment DD.
- F. Parties may elect to place Demand Resources associated with Behind The Meter Generation under the direction of the Office of the Interconnection for a Delivery Year by submitting a Sell Offer for such resource (as Self Supply, or with an offer price) in the Base Residual Auction for such Delivery Year. This election shall remain in effect for the entirety of such Delivery Year. In the event such an election is made, such Behind The Meter Generation will not be netted from load for the purposes of calculating the Daily Unforced Capacity Obligations under this Agreement.
- G. PJM measures Demand Resource Registrations in the following ways:

Firm Service Level (FSL) – Load management achieved by an end-use customer reducing its load to a pre-determined level (the Firm Service Level), upon notification from the Curtailment Service Provider’s market operations center or its agent.

Guaranteed Load Drop (GLD) – Load management achieved by an end-use customer reducing its load by a pre-determined amount (the Guaranteed Load Drop), upon notification from the Curtailment Service Provider’s market operations center or its agent. Typically, the load reduction is achieved through running customer-owned backup generators, or by shutting down process equipment.

H. Each Curtailment Service Provider must satisfy (or contract with another LSE, Curtailment Service Provider, or electric distribution company to provide) the following requirements:

- A point of contact with appropriate backup to ensure single call notification from PJM and timely execution of the notification process;
- Supplemental status reports, detailing Demand Resources available, as requested by PJM;
- Entry of customer-specific Demand Resource Registration information, for planning and verification purposes, into the designated PJM electronic system.
- Customer-specific compliance and verification information for each PJM-initiated Demand Resource event or test event, as well as aggregated Provider load drop data for Provider-initiated events, in accordance with established reporting guidelines.
- Load drop estimates for all Load Management events and test events, prepared in accordance with the PJM Manuals.

I. The Nominated Values (summer or winter) for each Demand Resource Registration shall be determined consistent with the process described below.

The summer Nominated Value for Firm Service Level customer(s) on a registration will be based on the peak load contribution for the customer(s), as typically determined by the 5CP methodology utilized by the electric distribution company to determine ICAP obligation values. The summer Nominated Value for a registration shall equal the total peak load contribution for the customers on the registration minus the summer Firm Service Level multiplied by the loss factor. The winter Nominated Value for Firm Service Level customer(s) on a registration shall equal the total Winter Peak Load for customers on the registration multiplied by Zonal Winter Weather Adjustment Factor minus winter Firm Service level and then the result is multiplied by the loss factor.

The summer Nominated Value for a Guaranteed Load Drop customer on a registration shall equal the summer guaranteed load drop amount, adjusted for system losses and shall not exceed the customer’s Peak Load Contribution, as established by the

customer's contract with the Curtailment Service Provider. The winter Nominated Value for a Guaranteed Load Drop customer on a registration shall be the winter guaranteed load drop amount, adjusted for system losses, and shall not exceed the customer's Winter Peak Load multiplied by Zonal Winter Weather Adjustment Factor multiplied by the loss factor, as established by the customer's contract with the Curtailment Service Provider.

Customer-specific Demand Resource Registration information (EDC account number, peak load contribution, Winter Peak Load, notification period, etc.) will be entered into the designated PJM electronic system to establish nominated values. Each Demand Resource Registration should be linked to a Demand Resource. Additional data may be required, as defined in sections J and K and the PJM Manuals.

- J. Nominated Values shall be reviewed based on documentation of customer-specific data and Demand Resource Registration information, to verify the amount of load management available and to set a summer or winter Nominated Value. Data is provided by both the zone EDC and the Curtailment Service Provider in the designated PJM electronic system, and must include the EDC meter number or other unique customer identifier, Peak Load Contribution (5CP), Winter Peak Load, contract firm service level or guaranteed load drop values, applicable loss factor, zone/area location of the load drop, number of active participants, etc. Such data must be uploaded and approved prior to the first day of the Delivery Year for which such Demand Resource Registration is effective. Curtailment Service Providers must provide this information concurrently to host EDCs.

For Firm Service Level and Guaranteed Load Drop customers, the 5CP values, for the zone and affected customers, will be adjusted to reflect an "unrestricted" peak for a zone, based on information provided by the Curtailment Service Provider. Load drop levels shall be estimated in accordance with guidelines in the PJM Manuals.

The daily Nominated Value of a Demand Resource with a Capacity Performance commitment (which may consist of an Annual Demand Resource with a Capacity Performance commitment and/or Summer Period Demand Resource with a Capacity Performance commitment) shall equal the sum of the summer Nominated Values of the registrations linked to such Demand Resource for the summer period of June through October and May of the Delivery Year, and shall equal the lesser of (i) the sum of the summer Nominated Values of the registrations linked to such Demand Resource or (ii) the sum of the winter Nominated Values of the registrations linked to such Demand Resource for the non-summer period of November through April of the Delivery Year.

- K. Compliance is the process utilized to review Provider performance during PJM-initiated Load Management events and tests. Compliance will be established for each Provider on an event specific basis for the Curtailment Service Provider's Demand Resource Registrations dispatched by the Office of the Interconnection during such event. PJM will establish and communicate reasonable deadlines for the timely submittal of event data to expedite compliance reviews. Compliance reviews will be completed as soon after the event as possible, with the expectation that reviews of a single event will be completed within two months of the end of the month in which the event took place.

Curtailed Service Providers are responsible for the submittal of compliance information to PJM for each PJM-initiated event and test during the compliance period.

Compliance is measured for Market Participant Bonus Performance, as applicable, and Non-Performance Charges. Non-Performance Charges are assessed for the defined obligation period of each Demand Resource as defined in RAA, Article 1, subject to the following requirements:

Compliance is checked on an individual customer basis for Firm Service Level, by comparing actual load during the event to the firm service level. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Curtailed Service Providers must submit actual customer load levels (for the event period) for the compliance report. Compliance for FSL will be based on:

Summer (June through October and the following May of a Delivery Year)- End use customer's current Delivery Year peak load contribution ("PLC") minus the metered load ("Load") multiplied by the loss factor ("LF"). The calculation is represented by:

$$(PLC) - (Load * LF)$$

Winter (November through April of a Delivery Year)- End use customer's Winter Peak Load ("WPL") multiplied by Zonal Winter Weather Adjustment Factor ("ZWWAF") multiplied by LF, minus the metered load ("Load") multiplied by the LF. The calculation is represented by:

$$(WPL * ZWWAF * LF) - (Load * LF)$$

Compliance is checked on an individual customer basis for Guaranteed Load Drop. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Guaranteed Load Drop compliance will be based on:

- (i) the lesser of (a) comparison load used to best represent what the load would have been if PJM did not declare a Load Management Event or the CSP did not initiate a test as outlined in the PJM Manuals, minus the Load and then multiplied by the LF, or (b) For a summer event, the PLC minus the Load multiplied by the LF. A summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the PLC. For a non-summer event, the WPL multiplied the ZWWAF multiplied by LF, minus the Load multiplied by the LF. A non-summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the WPL multiplied by the ZWWAF multiplied by LF.

- (ii) Curtailment Service Providers must submit actual loads and comparison loads for all hours during the day of the Load Management Event or the Load Management performance test, and for all hours during any other days as required by the Office of the Interconnection to calculate the load reduction. Comparison loads must be developed from the guidelines in the PJM Manuals, and note which method was employed.
- (iii) Methodologies for establishing comparison load for Guaranteed Load Drop end-use customers are described in greater detail in Manual M-19, PJM Manual for Load Forecasting and Analysis, at Attachment A: Load Drop Estimate Guidelines.

Load reduction compliance is determined on an hourly basis for a Demand Resource Registration linked to an Annual Demand Resource with a Capacity Performance commitment, for each FSL and GLD customer dispatched by the Office of the Interconnection for at least 30 minutes of the clock hour (i.e., “partial dispatch compliance hour”). Curtailment Service Provider may submit 1 minute load data for use in capacity compliance calculations for partial dispatch compliance hours subject to PJM approval and in accordance with the PJM Manuals where: (a) metering meets all Tariff and Manual requirements, (b) 1 minute load data shall be submitted to PJM for all locations on the registration, and (c) 1 minute load data measures energy consumption over the minute. The registered capacity commitment for a Demand Resource Registration with a Base or Capacity Performance commitment is not prorated based on the number of minutes dispatched during the clock hours. The actual hourly load reduction for the hour ending that includes a Performance Assessment Interval(s) is flat-profiled over the set of dispatch intervals in the hour in accordance with the PJM Manuals.

A Demand Resource Registration may not reduce their load below zero (i.e., export energy into the system). No compliance credit will be given for an incremental load drop below zero.

For a Performance Assessment Interval, compliance will be totaled over all dispatched registrations for FSL and GLD customers linked to a Provider’s Annual Demand Resource with a Capacity Performance commitment to determine the Actual Performance for such Demand Resource in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals. The Expected Performance for such Demand Resource shall be equal to the Provider’s committed capacity on the Demand Resource, adjusted to account for any linked registrations that were not dispatched by PJM. A Provider’s Demand Resources’ initial Performance Shortfalls shall be netted for all the seller’s Demand Resources in the Emergency Action Area to determine a net Emergency Action Area Performance Shortfall which is then allocated to the Capacity Market Seller’s Demand Resources in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals.

- L. Energy Efficiency Resources – all provisions in RAA, Schedule 6, section L and Tariff, Attachment DD-1, section L shall be effective only through the 2025/2026 Delivery Year. Thereafter, no Energy Efficiency Resources shall qualify to be offered into the RPM Auctions beginning with the 2026/2027 Delivery Year.

1. An Energy Efficiency Resource is a project, including installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards, designed to achieve a continuous (during peak summer and winter periods as described herein) reduction in electric energy consumption at the end-use customer's retail site that is not reflected in the peak load forecast prepared for the Delivery Year for which the Energy Efficiency Resource is proposed, and that is fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.
2. An Energy Efficiency Resource may be offered as a Capacity Resource in the Base Residual or Incremental Auctions for any Delivery Year beginning on or after June 1, 2011. No later than 30 days prior to the auction in which the resource is to be offered, the Capacity Market Seller shall submit to the Office of the Interconnection a notice of intent to offer the resource into such auction and a measurement and verification plan. The notice of intent shall include all pertinent project design data, including but not limited to the peak-load contribution of affected customers, a full description of the equipment, device, system or process intended to achieve the load reduction, the load reduction pattern, the project location, the project development timeline, and any other relevant data. Such notice also shall state the seller's proposed Nominated Energy Efficiency Value.
 - For the 2018/2019 Delivery Year and subsequent Delivery Years and for any Annual Energy Efficiency Resource committed as a Capacity Performance Resource, the seller's proposed Nominated Energy Efficiency Value for any Annual Energy Efficiency Resources, shall be the expected average load reduction, for all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 15:00 EPT and the hour ending 18:00 EPT. In addition, the expected average load reduction for all days from January 1 through February 28, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 8:00 EPT and the hour ending 9:00 EPT and between the hour ending 19:00 EPT and the hour ending 20:00 EPT shall not be less than the Nominated Energy Efficiency Value; and
 - For the 2020/2021 Delivery Year and subsequent Delivery Years, the seller's proposed Nominated Energy Efficiency Value for any Summer-Period Energy Efficiency Resource shall be the expected average load reduction between the hour ending 15:00 EPT and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday.

The measurement and verification plan shall describe the methods and procedures, consistent with the PJM Manuals, for determining the amount of

the load reduction and confirming that such reduction is achieved. The Office of the Interconnection shall determine, upon review of such notice, the Nominated Energy Efficiency Value that may be offered in the Reliability Pricing Model Auction.

3. An Energy Efficiency Resource may be offered with a price offer or as Self-Supply. If an Energy Efficiency Resource clears the auction, it shall receive the applicable Capacity Resource Clearing Price, subject to section 5 below. A Capacity Market Seller offering an Energy Efficiency Resource must comply with all applicable credit requirements as set forth in Tariff, Attachment Q. The Unforced Capacity value of an Energy Efficiency Resource offered into an RPM Auction or committed in a FRR Capacity Plan shall be the Nominated Energy Efficiency Value times the Forecast Pool Requirement.
4. An Energy Efficiency Resource that clears an auction for a Delivery Year may be offered in auctions for up to three additional consecutive Delivery Years, but shall not be assured of clearing in any such auction; provided, however, an Energy Efficiency Resource may not be offered for any Delivery Year in which any part of the peak season is beyond the expected life of the equipment, device, system, or process providing the expected load reduction; and provided further that a Capacity Market Seller that offers and clears an Energy Efficiency Resource in a BRA may elect a New Entry Price Adjustment on the same terms as set forth in Tariff, Attachment DD, section 5.14(c).
5. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than 30 days prior to each Auction an updated project status and measurement and verification plan subject to the criteria set forth in the PJM Manuals.
6. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than the start of such Delivery Year, an updated project status and detailed measurement and verification data meeting the standards for precision and accuracy set forth in the PJM Manuals. The final value of the Energy Efficiency Resource during such Delivery Year shall be as determined by the Office of the Interconnection based on the submitted data.
7. The Office of the Interconnection may audit, at the Capacity Market Seller's expense, any Energy Efficiency Resource committed to the PJM Region. The audit may be conducted any time including the Performance Hours of the Delivery Year.
8. For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, if a Relevant Electric Retail Regulatory Authority receives FERC authorization to qualify or prohibit Energy Efficiency Resource participation in a specific area(s) of the PJM Region, the following process applies:

(a) The Office of the Interconnection will publicly post a reference to the FERC authorization of a Relevant Electric Retail Regulatory Authority order, ordinance or resolution that qualifies or prohibits Energy Efficiency Resource participation, the applicable electric distribution company(ies), and the applicable auction(s) and/or Delivery Year(s).

(b) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all resources that are located in the jurisdiction of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation within the Zone or LDA, as required, and those outside of the area but within the Zone or LDA, as required.

(c) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all Energy Efficiency Resources to be offered as part of its Energy Efficiency measurement and verification plan and certified post-installation measurement and verification report. The Office of Interconnection will provide a list to the relevant electric distribution company for the specific area(s) to review for compliance with the Relevant Electric Retail Regulatory Authority of Capacity Market Sellers that are:

- (i) offering Energy Efficiency Resources in an RPM Auction within two (2) Business Days after the deadline for submitting an energy efficiency measurement and verification plan for such RPM Auction; and
- (ii) certifying Energy Efficiency Resources with a Delivery Year post-installation measurement and verification report, within two (2) Business Days of receipt of such Delivery Year post-installation measurement and verification report. The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource.

(d) The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation and provide a response to the Office of the Interconnection within five (5) Business Days after receiving the list of Capacity Market Sellers offering Energy Efficiency Resources. The Office of the Interconnection will not allow a

Capacity Market Seller to offer or certify Energy Efficiency Resources if an electric distribution company denies such Capacity Market Seller to deliver Energy Efficiency Resources in compliance with rules of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation.

- (9) For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, a Capacity Market Seller of Energy Efficiency Resources that cannot satisfy its RPM obligations in any Delivery Year due to the prohibition of participation by a Relevant Electric Retail Regulatory Authority authorized by FERC to prohibit participation of such resources may be relieved of its Capacity Resource Deficiency Charge by notifying the Office of the Interconnection by no later than seven (7) calendar days prior to the posting of the planning parameters for the Third Incremental Auction of that Delivery Year. After providing such notice, the affected Capacity Market Seller may elect to be relieved of its RPM commitment, and shall not be required to obtain replacement capacity for the resource, and no charges shall be assessed by the Office of the Interconnection for the Capacity Market Seller's deficiency in satisfying its RPM obligation for the resource for such Delivery Year. In such case, however, the Capacity Market Seller shall not be entitled to, nor be paid, any RPM revenues for such resource for that Delivery Year. The Office of the Interconnection will apply corresponding adjustments to the quantity of Buy Bids or Sell Offers in the Incremental Auctions for such Delivery Years in accordance with Tariff, Attachment DD, sections 5.12(b)(ii) and 5.12(b)(iii).

PJM Reliability Assurance Agreement
(Marked/Redline Format)

SCHEDULE 6

PROCEDURES FOR DEMAND RESOURCES AND ENERGY EFFICIENCY

A. Parties can partially or wholly offset the amounts payable for the Locational Reliability Charge with Demand Resources that are operated under the direction of the Office of the Interconnection. FRR Entities may reduce their capacity obligations with Demand Resources that are operated under the direction of the Office of the Interconnection and detailed in such entity's FRR Capacity Plan. Demand Resources qualifying under the criteria set forth below may be offered for sale or designated as Self-Supply in the Base Residual Auction, included in an FRR Capacity Plan, or offered for sale in any Incremental Auction, for any Delivery Year for which such resource qualifies. Qualified Demand Resources generally fall in one of two categories, i.e., Guaranteed Load Drop or Firm Service Level, as further specified in section G below and the PJM Manuals. Qualified Demand Resources may be provided by a Curtailment Service Provider, notwithstanding that such Curtailment Service Provider is not a Party to this Agreement. Such Curtailment Service Providers must satisfy the requirements hereof and the PJM Manuals.

1. A Party must formally notify, in accordance with the requirements of the PJM Manuals and section F hereof, as applicable, the Office of the Interconnection of the Demand Resource Registration that it is placing under the direction of the Office of the Interconnection. A Party must further notify the Office of the Interconnection whether the Demand Resource Registration is linked to a Summer-Period Demand Resource or an Annual Demand Resource.

2. A Demand Resource Registration must achieve its full load reduction within the following time period:

(a) For the 2015/2016 Delivery Year and subsequent Delivery Years, a Demand Resource Registration must be able to fully respond to a Load Management Event within 30 minutes of notification from the Office of the Interconnection. This default 30 minute prior notification shall apply unless a Curtailment Service Provider obtains an exception from the Office of the Interconnection due to physical operational limitations that prevent the Demand Resource Registration from reducing load within that timeframe. In such case, the Curtailment Service Provider shall submit a request for an exception to the 30 minute prior notification requirement to the Office of the Interconnection, at the time the Registration Form for that Demand Resource Registration is submitted in accordance with Tariff, Attachment K-Appendix. The only alternative notification times that the Office of Interconnection will permit, upon approval of an exception request, are 60 minutes and 120 minutes prior to a Load Management Event. The Curtailment Service Provider shall indicate in writing, in the appropriate application, that it seeks an exception to permit a prior notification time of 60 minutes or 120 minutes, and the reason(s) for the requested exception. A Curtailment Service Provider shall not submit a request for an exception to the default 30 minute notification period unless it has done its due diligence to confirm that the Demand

Resource Registration is physically incapable of responding within that timeframe based on one or more of the reasons set forth below and as may be further defined in the PJM Manuals and has obtained detailed data and documentation to support this determination.

In order to establish that a Demand Resource Registration is reasonably expected to be physically unable to reduce load in that timeframe, the Curtailment Service Provider that submitted the Demand Resource Registration must demonstrate that:

- (i) The manufacturing processes for the Demand Resource Registration require gradual reduction to avoid damaging major industrial equipment used in the manufacturing process, or damage to the product generated or feedstock used in the manufacturing process;
- (ii) Transfer of load to back-up generation requires time-intensive manual process taking more than 30 minutes;
- (iii) On-site safety concerns prevent location from implementing reduction plan in less than 30 minutes; or,
- (iv) The Demand Resource Registration is comprised of mass market residential customers or Small Commercial Customers which collectively cannot be notified of a Load Management Event within a 30-minute timeframe due to unavoidable communications latency, in which case the requested notification time shall be no longer than 120 minutes.

The Office of the Interconnection may request data and documentation from the Curtailment Service Provider and such Curtailment Service Provider shall provide to the Office of the Interconnection within three (3) Business Days of a request therefor, a copy of all of the data and documentation supporting the exception request. Failure to provide a timely response to such request shall cause the exception to terminate the following Operating Day.

At its sole option and discretion, the Office of the Interconnection may review the data and documentation provided by the Curtailment Service Provider to determine if the Demand Resource Registration has met one or more of the criteria above. The Office of the Interconnection will notify the Curtailment Service Provider in writing of its determination by no later than ten (10) Business Days after receipt of the data and documentation.

The Curtailment Service Provider shall provide written notification to the Office of the Interconnection of a material change to the facts that supported its exception request within three (3) Business Days of becoming aware of such material change in facts, and, if the Office of Interconnection determines that the physical limitation criteria above are no longer being met, the Demand Resource Registration shall be subject to the default notification period of 30 minutes immediately upon such determination.

3. The initiation of load reduction, upon the request of the Office of the Interconnection, must be within the authority of the dispatchers of the Party. No additional approvals should be required.

4. The initiation of load reduction upon the request of the Office of the Interconnection is considered a pre-emergency or emergency action and must be implementable prior to a voltage reduction.

5. A Curtailment Service Provider intending to offer for sale or designate for self-supply, a Demand Resource in any RPM Auction, or intending to include a Demand Resource in any FRR Capacity Plan must demonstrate, to PJM's satisfaction, that such resource shall have the capability to provide a reduction in demand, or otherwise control load, on or before the start of the Delivery Year for which such resource is committed. As part of such demonstration, each such Curtailment Service Provider shall submit a Demand Resource Sell Offer Plan in accordance with the standards and procedures set forth in RAA, Schedule 6, section A-1; RAA, Schedule 8.1 (as to FRR Capacity Plans) and the PJM Manuals, no later than 30 days prior to, as applicable, the RPM Auction in which such resource is to be offered, or the deadline for submission of the FRR Capacity Plan in which such resource is to be included. PJM may verify the Curtailment Service Provider's adherence to the Demand Resource Sell Offer Plan at any time. A Curtailment Service Provider with a PJM-approved Demand Resource Sell Offer Plan will be permitted to offer up to the approved Demand Resource quantity into the subject RPM Auction or include such resource in its FRR Capacity Plan.

6. Selection of a Demand Resource in an RPM Auction results in commitment of capacity to the PJM Region. Demand Resources that are so committed must be linked to registrations participating in the Full Program Option or Capacity Only Option of the Emergency Load Response and Pre-Emergency Load Response Program and thus available for dispatch during PJM-declared pre-emergency events and emergency events.

A-1. A Demand Resource Sell Offer Plan shall consist of a completed template document in the form posted on the PJM website, requiring the information set forth below and in the PJM Manuals, and a Demand Resource Officer Certification Form signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification. The Demand Resource Sell Offer Plan must provide information that supports the Demand Resource Provider's intended Demand Resource Sell Offers and demonstrates that the Demand Resources are being offered with the intention that the MW quantity that clears the auction is reasonably expected to be physically delivered through Demand Resource registrations for the relevant Delivery Year. The Demand Resource Sell Offer Plan shall include all Existing Demand Resources and all Planned Demand Resources that the Demand Resource Provider intends to offer into an RPM Auction or include in an FRR Capacity Plan.

1. Demand Resource Sell Offer Plan Template. The Demand Resource Sell Offer Plan template, in the form provided on the PJM website, shall require the

Demand Resource Provider to provide the following information and such other information as specified in the PJM Manuals:

(a) Summary Information. The completed template shall include the Demand Resource Provider's company name, contact information, and the Nominated DR Value in ICAP MWs by Zone/sub-Zone that the Demand Resource Provider intends to offer, stated separately for Existing Demand Resources and Planned Demand Resources. The total Nominated DR Value in MWs for each Zone/sub-Zone shall be the sum of the Nominated DR Value of Existing Demand Resources and the Nominated DR Value of Planned Demand Resources, and shall be the maximum MW amount the Provider intends to offer in the RPM Auction for the indicated Zone/sub-Zone, provided that nothing herein shall preclude the Demand Resource Provider from offering in the auction a lesser amount than the total Nominated DR Value shown in its Demand Resource Sell Offer Plan.

(b) Existing Demand Resources. The Demand Resource Provider shall identify all Existing Demand Resources by identifying end-use customer sites that are currently registered with PJM (even if not registered by such Demand Resource Provider) and that the Demand Resource Provider reasonably expects to have under a contract to reduce load based on PJM dispatch instructions by the start of the auction Delivery Year.

(c) Planned Demand Resources. The Demand Resource Provider shall provide the details of, and key assumptions underlying, the Planned Demand Resource quantities (i.e., all Demand Resource quantities in excess of Existing Demand Resource quantities) contained in the Demand Resource Sell Offer Plan, including:

(i) key program attributes and assumptions used to develop the Planned Demand Resource quantities, including, but not limited to, discussion of:

- method(s) of achieving load reduction at customer site(s);
- equipment to be controlled or installed at customer site(s), if any;
- plan and ability to acquire customers;
- types of customer targeted;
- support of market potential and market share for the target customer base, with adjustments for Existing Demand Resource customers within this market and the potential for other Demand Resource Providers targeting the same customers; and
- assumptions regarding regulatory approval of program(s), if applicable.

(ii) Zone/sub-Zone information by end-use customer segment for all Nominated DR Values for which an end-use customer site is not identified, to include the number in each segment of end-use customers expected to be registered for the subject Delivery Year, the average Peak Load Contribution per end-use customer for such segment, and the average Nominated DR Value per customer for such segment. End-use customer segments may include residential, commercial, small industrial, medium industrial, and large industrial, as identified and defined in the PJM Manuals, provided that nothing herein or in the Manuals shall preclude the Provider from identifying more specific customer segments within the commercial and industrial categories, if known.

(iii) Information by end-use customer site to the extent required by subsection A-1(1)(c)(iv) or, if not required by such subsection, to the extent known at the time of the submittal of the Demand Resource Sell Offer Plan, to include: customer EDC account number (if known), customer name, customer premise address, Zone/sub-Zone in which the customer is located, end-use customer segment, current Peak Load Contribution value (or an estimate if actual value not known) and an estimate of expected Peak Load Contribution for the subject Delivery Year, and an estimated Nominated DR Value.

(iv) End-use customer site-specific information shall be required for any Zones or sub-Zones identified by PJM pursuant to this subsection for the portion, if any, of a Demand Resource Provider's intended offer in such Zones or sub-Zones that exceeds a Sell Offer threshold determined pursuant to this subsection, as any such excess quantity under such conditions should reflect Planned Demand Resources from end-use customer sites that the Provider has a high degree of certainty it will physically deliver for the subject Delivery Year. In accordance with the procedures in subsection A-1(3) below, PJM shall identify, as requiring site-specific information, all Zones and sub-Zones that comprise any LDA group (from a list of LDA groups stated in the PJM Manuals) in which [the quantity of cleared Demand Resources from the most recent Base Residual Auction] plus [the quantity of Demand Resources included in FRR Capacity Plans for the Delivery Year addressed by the most recent Base Residual Auction] in any Zone or sub-Zone of such LDA group exceeds the greater of:

- the maximum Demand Resources quantity registered with PJM for such Zone for any Delivery Year from the current (at time of plan submission) Delivery Year and the two preceding Delivery Years; and

- the potential Demand Resource quantity for such Zone estimated by PJM based on an independent published assessment of demand response potential that is reasonably applicable to such Zone, as identified in the PJM Manuals.

For each such Zone and sub-Zone, the Sell Offer threshold for each Demand Resource Provider shall be the higher of:

- the Demand Resource Provider's maximum Demand Resource quantity registered with PJM for such Zone/sub-Zone over the current Delivery Year (at the time of plan submission) and two preceding Delivery Years;
- the Demand Resource Provider's maximum for any single Delivery Year of [such provider's cleared Demand Resource quantity] plus [such provider's quantity of Demand Resources included in FRR Capacity Plans] from the three forward Delivery Years addressed by the three most recent Base Residual Auctions for such Zone/sub-Zone; and
- 10 MW.

(d) Schedule. The Demand Resource Provider shall provide an approximate timeline for procuring end-use customer sites as needed to physically deliver the total Nominated DR Value (for both Existing Demand Resources and Planned Demand Resources) by Zone/sub-Zone in the Demand Resource Sell Offer Plan. The Demand Resource Provider must specify the cumulative number of customers and the cumulative Nominated DR Value associated with each end-use customer segment within each Zone/sub-Zone that the Demand Resource Provider expects (at the time of plan submission) to have under contract as of June 1 each year between the time of the auction and the subject Delivery Year.

2. Demand Resource Officer Certification Form. Each Demand Resource Sell Offer Plan must include a Demand Resource Officer Certification, signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification, in the form shown in the PJM Manuals, which form shall include the following certifications:

(a) that the signing officer has reviewed the Demand Resource Sell Offer Plan and the information supplied to PJM in support of the Plan is true and correct as of the date of the certification;

(b) that the Sell Offer Plan does not include any Critical Natural Gas Infrastructure facilities, and

(c) that the Demand Resource Provider is submitting the Plan with the reasonable expectation, based upon its analyses as of the date of the certification, to physically deliver all megawatts that clear the RPM Auction through Demand Resource registrations by the specified Delivery Year.

As set forth in the form provided in the PJM Manuals, the certification shall specify that it does not in any way abridge, expand, or otherwise modify the current provisions of the PJM Tariff, Operating Agreement and/or RAA, or the Demand Resource Provider's rights and obligations thereunder, including the Demand Resource Provider's ability to adjust capacity obligations through participation in PJM incremental auctions and bilateral transactions.

3. Procedures. No later than December 1 prior to the Base Residual Auction for a Delivery Year, PJM shall post to the PJM website a list of Zones and sub-Zones, if any, for which end-use customer site-specific information shall be required under the conditions specified in subsection A-1(1)(c)(iv) above for all RPM Auctions conducted for such Delivery Year. Once so identified, a Zone or sub-Zone shall remain on the list for future Delivery Years until the threshold determined under subsection A-1(1)(c)(iv) above is not exceeded for three consecutive Delivery Years. No later than 30 days prior to the RPM Auction in which a Demand Resource Provider intends to offer a Demand Resource, the Demand Resource Provider shall submit to PJM a completed Demand Resource Sell Offer Plan template and a Demand Resource Officer Certification Form signed by a duly authorized officer of the Provider. PJM will review all submitted DR Sell Offer Plans. No later than 10 Business Days prior to the subject RPM Auction, PJM shall notify any Demand Resource Providers that have identified the same end-use customer site(s) in their respective DR Sell Offer Plans for the same Delivery Year. In such event, the MWs associated with such site(s) will not be approved for inclusion in a Sell Offer in an RPM Auction by any of the Demand Resource Providers, unless a Demand Resource Provider provides a letter of support from the end-use customer indicating that it is likely to execute a contract with that Demand Resource Provider for the relevant Delivery Year, or provides other comparable evidence of likely commitment. Such letter of support or other supporting evidence must be provided to PJM no later than 7 Business Days prior to the subject RPM Auction. If an end-use customer provides letters of support for the same site for the same Delivery Year to multiple Demand Resource Providers, the MWs associated with such end-use customer site shall not be approved as a Demand Resource for any of the Demand Resource Providers. No later than 5 Business Days prior to the subject RPM Auction, PJM will notify each Demand Resource Provider of the approved Demand Resource quantity, by Zone/sub-Zone, that such Demand Resource Provider is permitted to offer into such RPM Auction.

B. The Unforced Capacity value of a Demand Resource will be determined:

(1) for Delivery Years through the 2024/2025 Delivery Year, as the product of the Nominated Value of the Demand Resource times the Forecast Pool Requirement. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.

(2) for the 2025/2026 Delivery Year and subsequent Delivery Years, in accordance with RAA, Schedule 9.2. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.

- C. Demand Resources offered and cleared in a Base Residual or Incremental Auction shall receive the corresponding Capacity Resource Clearing Price as determined in such auction, in accordance with Tariff, Attachment DD. For Delivery Years beginning with the Delivery Year that commences on June 1, 2013, any Demand Resources located in a Zone with multiple LDAs shall receive the Capacity Resource Clearing Price applicable to the location of such resource within such Zone, as identified in such resource's offer. Further, the Curtailment Service Provider shall register its resource in the same location within the Zone as specified in its cleared sell offer, and shall be subject to deficiency charges under Tariff, Attachment DD to the extent it fails to provide the resource in such location consistent with its cleared offer.
- D. The Party, Electric Distributor, or Curtailment Service Provider that establishes a contractual relationship (by contract or tariff rate) with a customer for load reductions is entitled to receive the compensation specified in section C for a committed Demand Resource, notwithstanding that such provider is not the customer's energy supplier.
- E. Any Party hereto shall demonstrate that its Demand Resources performed during periods when load management procedures were invoked by the Office of the Interconnection. The Office of the Interconnection shall adopt and maintain rules and procedures for verifying the performance of such resources, as set forth in section K hereof and the PJM Manuals. In addition, committed Demand Resources that do not comply with the directions of the Office of the Interconnection to reduce load during an emergency shall be subject to the penalty charge set forth in Tariff, Attachment DD.
- F. Parties may elect to place Demand Resources associated with Behind The Meter Generation under the direction of the Office of the Interconnection for a Delivery Year by submitting a Sell Offer for such resource (as Self Supply, or with an offer price) in the Base Residual Auction for such Delivery Year. This election shall remain in effect for the entirety of such Delivery Year. In the event such an election is made, such Behind The Meter Generation will not be netted from load for the purposes of calculating the Daily Unforced Capacity Obligations under this Agreement.
- G. PJM measures Demand Resource Registrations in the following ways:
 - Firm Service Level (FSL) – Load management achieved by an end-use customer reducing its load to a pre-determined level (the Firm Service Level), upon notification from the Curtailment Service Provider's market operations center or its agent.

Guaranteed Load Drop (GLD) – Load management achieved by an end-use customer reducing its load by a pre-determined amount (the Guaranteed Load Drop), upon notification from the Curtailment Service Provider’s market operations center or its agent. Typically, the load reduction is achieved through running customer-owned backup generators, or by shutting down process equipment.

H. Each Curtailment Service Provider must satisfy (or contract with another LSE, Curtailment Service Provider, or electric distribution company to provide) the following requirements:

- A point of contact with appropriate backup to ensure single call notification from PJM and timely execution of the notification process;
- Supplemental status reports, detailing Demand Resources available, as requested by PJM;
- Entry of customer-specific Demand Resource Registration information, for planning and verification purposes, into the designated PJM electronic system.
- Customer-specific compliance and verification information for each PJM-initiated Demand Resource event or test event, as well as aggregated Provider load drop data for Provider-initiated events, in accordance with established reporting guidelines.
- Load drop estimates for all Load Management events and test events, prepared in accordance with the PJM Manuals.

I. The Nominated Values (summer or winter) for each Demand Resource Registration shall be determined consistent with the process described below.

The summer Nominated Value for Firm Service Level customer(s) on a registration will be based on the peak load contribution for the customer(s), as typically determined by the 5CP methodology utilized by the electric distribution company to determine ICAP obligation values. The summer Nominated Value for a registration shall equal the total peak load contribution for the customers on the registration minus the summer Firm Service Level multiplied by the loss factor. The winter Nominated Value for Firm Service Level customer(s) on a registration shall equal the total Winter Peak Load for customers on the registration multiplied by Zonal Winter Weather Adjustment Factor minus winter Firm Service level and then the result is multiplied by the loss factor.

The summer Nominated Value for a Guaranteed Load Drop customer on a registration shall equal the summer guaranteed load drop amount, adjusted for system losses and shall not exceed the customer’s Peak Load Contribution, as established by the customer’s contract with the Curtailment Service Provider. The winter Nominated Value for a Guaranteed Load Drop customer on a registration shall be the winter guaranteed load drop amount, adjusted for system losses, and shall not exceed the customer’s Winter

Peak Load multiplied by Zonal Winter Weather Adjustment Factor multiplied by the loss factor, as established by the customer's contract with the Curtailment Service Provider.

Customer-specific Demand Resource Registration information (EDC account number, peak load contribution, Winter Peak Load, notification period, etc.) will be entered into the designated PJM electronic system to establish nominated values. Each Demand Resource Registration should be linked to a Demand Resource. Additional data may be required, as defined in sections J and K and the PJM Manuals.

- J. Nominated Values shall be reviewed based on documentation of customer-specific data and Demand Resource Registration information, to verify the amount of load management available and to set a summer or winter, Nominated Value. Data is provided by both the zone EDC and the Curtailment Service Provider in the designated PJM electronic system, and must include the EDC meter number or other unique customer identifier, Peak Load Contribution (5CP), Winter Peak Load, contract firm service level or guaranteed load drop values, applicable loss factor, zone/area location of the load drop, number of active participants, etc. Such data must be uploaded and approved prior to the first day of the Delivery Year for which such Demand Resource Registration is effective. Curtailment Service Providers must provide this information concurrently to host EDCs.

For Firm Service Level and Guaranteed Load Drop customers, the 5CP values, for the zone and affected customers, will be adjusted to reflect an "unrestricted" peak for a zone, based on information provided by the Curtailment Service Provider. Load drop levels shall be estimated in accordance with guidelines in the PJM Manuals.

The daily Nominated Value of a Demand Resource with a Capacity Performance commitment (which may consist of an Annual Demand Resource with a Capacity Performance commitment and/or Summer Period Demand Resource with a Capacity Performance commitment) shall equal the sum of the summer Nominated Values of the registrations linked to such Demand Resource for the summer period of June through October and May of the Delivery Year, and shall equal the lesser of (i) the sum of the summer Nominated Values of the registrations linked to such Demand Resource or (ii) the sum of the winter Nominated Values of the registrations linked to such Demand Resource for the non-summer period of November through April of the Delivery Year.

- K. Compliance is the process utilized to review Provider performance during PJM-initiated Load Management events and tests. Compliance will be established for each Provider on an event specific basis for the Curtailment Service Provider's Demand Resource Registrations dispatched by the Office of the Interconnection during such event. PJM will establish and communicate reasonable deadlines for the timely submittal of event data to expedite compliance reviews. Compliance reviews will be completed as soon after the event as possible, with the expectation that reviews of a single event will be completed within two months of the end of the month in which the event took place. Curtailment Service Providers are responsible for the submittal of compliance information to PJM for each PJM-initiated event and test during the compliance period.

Compliance is measured for Market Participant Bonus Performance, as applicable, and Non-Performance Charges. Non-Performance Charges are assessed for the defined obligation period of each Demand Resource as defined in RAA, Article 1, subject to the following requirements:

Compliance is checked on an individual customer basis for Firm Service Level, by comparing actual load during the event to the firm service level. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Curtailment Service Providers must submit actual customer load levels (for the event period) for the compliance report. Compliance for FSL will be based on:

Summer (June through October and the following May of a Delivery Year)- End use customer's current Delivery Year peak load contribution ("PLC") minus the metered load ("Load") multiplied by the loss factor ("LF"). The calculation is represented by:

$$(PLC) - (Load * LF)$$

Winter (November through April of a Delivery Year)- End use customer's Winter Peak Load ("WPL") multiplied by Zonal Winter Weather Adjustment Factor ("ZWWAF") multiplied by LF, minus the metered load ("Load") multiplied by the LF. The calculation is represented by:

$$(WPL * ZWWAF * LF) - (Load * LF)$$

Compliance is checked on an individual customer basis for Guaranteed Load Drop. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Guaranteed Load Drop compliance will be based on:

- (i) the lesser of (a) comparison load used to best represent what the load would have been if PJM did not declare a Load Management Event or the CSP did not initiate a test as outlined in the PJM Manuals, minus the Load and then multiplied by the LF, or (b) For a summer event, the PLC minus the Load multiplied by the LF. A summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the PLC. For a non-summer event, the WPL multiplied the ZWWAF multiplied by LF, minus the Load multiplied by the LF. A non-summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the WPL multiplied by the ZWWAF multiplied by LF.
- (ii) Curtailment Service Providers must submit actual loads and comparison loads for all hours during the day of the Load Management Event or the Load Management performance test, and for all hours during any other days as required by the Office

of the Interconnection to calculate the load reduction. Comparison loads must be developed from the guidelines in the PJM Manuals, and note which method was employed.

- (iii) Methodologies for establishing comparison load for Guaranteed Load Drop end-use customers are described in greater detail in Manual M-19, PJM Manual for Load Forecasting and Analysis, at Attachment A: Load Drop Estimate Guidelines.

Load reduction compliance is determined on an hourly basis for a Demand Resource Registration linked to an Annual Demand Resource with a Capacity Performance commitment, for each FSL and GLD customer dispatched by the Office of the Interconnection for at least 30 minutes of the clock hour (i.e., “partial dispatch compliance hour”). Curtailment Service Provider may submit 1 minute load data for use in capacity compliance calculations for partial dispatch compliance hours subject to PJM approval and in accordance with the PJM Manuals where: (a) metering meets all Tariff and Manual requirements, (b) 1 minute load data shall be submitted to PJM for all locations on the registration, and (c) 1 minute load data measures energy consumption over the minute. The registered capacity commitment for a Demand Resource Registration with a Base or Capacity Performance commitment is not prorated based on the number of minutes dispatched during the clock hours. The actual hourly load reduction for the hour ending that includes a Performance Assessment Interval(s) is flat-profiled over the set of dispatch intervals in the hour in accordance with the PJM Manuals.

A Demand Resource Registration may not reduce their load below zero (i.e., export energy into the system). No compliance credit will be given for an incremental load drop below zero.

For a Performance Assessment Interval, compliance will be totaled over all dispatched registrations for FSL and GLD customers linked to a Provider’s Annual Demand Resource with a Capacity Performance commitment to determine the Actual Performance for such Demand Resource in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals. The Expected Performance for such Demand Resource shall be equal to the Provider’s committed capacity on the Demand Resource, adjusted to account for any linked registrations that were not dispatched by PJM. A Provider’s Demand Resources’ initial Performance Shortfalls shall be netted for all the seller’s Demand Resources in the Emergency Action Area to determine a net Emergency Action Area Performance Shortfall which is then allocated to the Capacity Market Seller’s Demand Resources in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals.

- L. Energy Efficiency Resources – all provisions in RAA, Schedule 6, section L and Tariff, Attachment DD-1, section L shall be effective only through the 2025/2026 Delivery Year. Thereafter, no Energy Efficiency Resources shall qualify to be offered into the RPM Auctions beginning with the 2026/2027 Delivery Year.

1. An Energy Efficiency Resource is a project, including installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards, designed to achieve a continuous (during peak summer and winter periods as described herein) reduction in electric energy consumption at the end-use customer's retail site that is not reflected in the peak load forecast prepared for the Delivery Year for which the Energy Efficiency Resource is proposed, and that is fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.
2. An Energy Efficiency Resource may be offered as a Capacity Resource in the Base Residual or Incremental Auctions for any Delivery Year beginning on or after June 1, 2011. No later than 30 days prior to the auction in which the resource is to be offered, the Capacity Market Seller shall submit to the Office of the Interconnection a notice of intent to offer the resource into such auction and a measurement and verification plan. The notice of intent shall include all pertinent project design data, including but not limited to the peak-load contribution of affected customers, a full description of the equipment, device, system or process intended to achieve the load reduction, the load reduction pattern, the project location, the project development timeline, and any other relevant data. Such notice also shall state the seller's proposed Nominated Energy Efficiency Value.
 - For the 2018/2019 Delivery Year and subsequent Delivery Years and for any Annual Energy Efficiency Resource committed as a Capacity Performance Resource, the seller's proposed Nominated Energy Efficiency Value for any Annual Energy Efficiency Resources, shall be the expected average load reduction, for all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 15:00 EPT and the hour ending 18:00 EPT. In addition, the expected average load reduction for all days from January 1 through February 28, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 8:00 EPT and the hour ending 9:00 EPT and between the hour ending 19:00 EPT and the hour ending 20:00 EPT shall not be less than the Nominated Energy Efficiency Value; and
 - For the 2020/2021 Delivery Year and subsequent Delivery Years, the seller's proposed Nominated Energy Efficiency Value for any Summer-Period Energy Efficiency Resource shall be the expected average load reduction between the hour ending 15:00 EPT and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday.

The measurement and verification plan shall describe the methods and procedures, consistent with the PJM Manuals, for determining the amount of the load reduction and confirming that such reduction is achieved. The Office

of the Interconnection shall determine, upon review of such notice, the Nominated Energy Efficiency Value that may be offered in the Reliability Pricing Model Auction.

3. An Energy Efficiency Resource may be offered with a price offer or as Self-Supply. If an Energy Efficiency Resource clears the auction, it shall receive the applicable Capacity Resource Clearing Price, subject to section 5 below. A Capacity Market Seller offering an Energy Efficiency Resource must comply with all applicable credit requirements as set forth in Tariff, Attachment Q. The Unforced Capacity value of an Energy Efficiency Resource offered into an RPM Auction or committed in a FRR Capacity Plan shall be the Nominated Energy Efficiency Value times the Forecast Pool Requirement.
4. An Energy Efficiency Resource that clears an auction for a Delivery Year may be offered in auctions for up to three additional consecutive Delivery Years, but shall not be assured of clearing in any such auction; provided, however, an Energy Efficiency Resource may not be offered for any Delivery Year in which any part of the peak season is beyond the expected life of the equipment, device, system, or process providing the expected load reduction; and provided further that a Capacity Market Seller that offers and clears an Energy Efficiency Resource in a BRA may elect a New Entry Price Adjustment on the same terms as set forth in Tariff, Attachment DD, section 5.14(c).
5. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than 30 days prior to each Auction an updated project status and measurement and verification plan subject to the criteria set forth in the PJM Manuals.
6. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than the start of such Delivery Year, an updated project status and detailed measurement and verification data meeting the standards for precision and accuracy set forth in the PJM Manuals. The final value of the Energy Efficiency Resource during such Delivery Year shall be as determined by the Office of the Interconnection based on the submitted data.
7. The Office of the Interconnection may audit, at the Capacity Market Seller's expense, any Energy Efficiency Resource committed to the PJM Region. The audit may be conducted any time including the Performance Hours of the Delivery Year.
8. For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, if a Relevant Electric Retail Regulatory Authority receives FERC authorization to qualify or prohibit Energy Efficiency Resource participation in a specific area(s) of the PJM Region, the following process applies:

(a) The Office of the Interconnection will publicly post a reference to the FERC authorization of a Relevant Electric Retail Regulatory Authority order, ordinance or resolution that qualifies or prohibits Energy Efficiency Resource participation, the applicable electric distribution company(ies), and the applicable auction(s) and/or Delivery Year(s).

(b) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all resources that are located in the jurisdiction of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation within the Zone or LDA, as required, and those outside of the area but within the Zone or LDA, as required.

(c) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all Energy Efficiency Resources to be offered as part of its Energy Efficiency measurement and verification plan and certified post-installation measurement and verification report. The Office of Interconnection will provide a list to the relevant electric distribution company for the specific area(s) to review for compliance with the Relevant Electric Retail Regulatory Authority of Capacity Market Sellers that are:

- (i) offering Energy Efficiency Resources in an RPM Auction within two (2) Business Days after the deadline for submitting an energy efficiency measurement and verification plan for such RPM Auction; and
- (ii) certifying Energy Efficiency Resources with a Delivery Year post-installation measurement and verification report, within two (2) Business Days of receipt of such Delivery Year post-installation measurement and verification report. The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource.

(d) The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation and provide a response to the Office of the Interconnection within five (5) Business Days after receiving the list of Capacity Market Sellers offering Energy Efficiency Resources. The Office of the Interconnection will not allow a Capacity Market Seller to offer or certify Energy Efficiency Resources if an electric distribution company denies such Capacity Market Seller to deliver

Energy Efficiency Resources in compliance with rules of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation.

- (9) For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, a Capacity Market Seller of Energy Efficiency Resources that cannot satisfy its RPM obligations in any Delivery Year due to the prohibition of participation by a Relevant Electric Retail Regulatory Authority authorized by FERC to prohibit participation of such resources may be relieved of its Capacity Resource Deficiency Charge by notifying the Office of the Interconnection by no later than seven (7) calendar days prior to the posting of the planning parameters for the Third Incremental Auction of that Delivery Year. After providing such notice, the affected Capacity Market Seller may elect to be relieved of its RPM commitment, and shall not be required to obtain replacement capacity for the resource, and no charges shall be assessed by the Office of the Interconnection for the Capacity Market Seller's deficiency in satisfying its RPM obligation for the resource for such Delivery Year. In such case, however, the Capacity Market Seller shall not be entitled to, nor be paid, any RPM revenues for such resource for that Delivery Year. The Office of the Interconnection will apply corresponding adjustments to the quantity of Buy Bids or Sell Offers in the Incremental Auctions for such Delivery Years in accordance with Tariff, Attachment DD, sections 5.12(b)(ii) and 5.12(b)(iii).

Attachment B

Revisions to the
PJM Open Access Transmission Tariff and
PJM Reliability Assurance Agreement
(Identified by Additional Cover Pages)
(Clean Format)

PJM Open Access Transmission Tariff
(Clean Format)

ATTACHMENT DD-1

Preface: The provisions of this Attachment incorporate into the Tariff for ease of reference the provisions of Schedule 6 of the Reliability Assurance Agreement among Load Serving Entities in the PJM Region. As a result, this Attachment will be modified, subject to FERC approval, so that the terms and conditions set forth herein remain consistent with the corresponding terms and conditions of RAA, Schedule 6. Capitalized terms used herein that are not otherwise defined in Tariff, Attachment DD or elsewhere in this Tariff have the meaning set forth in the RAA.

PROCEDURES FOR DEMAND RESOURCES AND ENERGY EFFICIENCY

A. Parties can partially or wholly offset the amounts payable for the Locational Reliability Charge with Demand Resources that are operated under the direction of the Office of the Interconnection. FRR Entities may reduce their capacity obligations with Demand Resources that are operated under the direction of the Office of the Interconnection and detailed in such entity's FRR Capacity Plan. Demand Resources qualifying under the criteria set forth below may be offered for sale or designated as Self-Supply in the Base Residual Auction, included in an FRR Capacity Plan, or offered for sale in any Incremental Auction, for any Delivery Year for which such resource qualifies. Qualified Demand Resources generally fall in one of two categories, i.e., Guaranteed Load Drop or Firm Service Level, as further specified in section G below and the PJM Manuals. Qualified Demand Resources may be provided by a Curtailment Service Provider, notwithstanding that such Curtailment Service Provider is not a Party to this Agreement. Such Curtailment Service Providers must satisfy the requirements hereof and the PJM Manuals.

1. A Party must formally notify, in accordance with the requirements of the PJM Manuals and section F hereof, as applicable, the Office of the Interconnection of the Demand Resource Registration that it is placing under the direction of the Office of the Interconnection. A Party must further notify the Office of the Interconnection whether the Demand Resource Registration is linked to a Summer-Period Demand Resource or an Annual Demand Resource.

2. A Demand Resource Registration must achieve its full load reduction within the following time period:

- (a) For the 2015/2016 Delivery Year and subsequent Delivery Years, a Demand Resource Registration must be able to fully respond to a Load Management Event within 30 minutes of notification from the Office of the Interconnection. This default 30 minute prior notification shall apply unless a Curtailment Service Provider obtains an exception from the Office of the Interconnection due to physical operational limitations that prevent the Demand Resource Registration from reducing load within that timeframe. In such case, the Curtailment Service Provider shall submit a request for an exception to the 30 minute prior notification requirement to the Office of the Interconnection, at the time the Registration Form for that Demand Resource Registration is submitted in accordance with Tariff, Attachment K-Appendix. The only alternative notification times that the Office

of Interconnection will permit, upon approval of an exception request, are 60 minutes and 120 minutes prior to a Load Management Event. The Curtailment Service Provider shall indicate in writing, in the appropriate application, that it seeks an exception to permit a prior notification time of 60 minutes or 120 minutes, and the reason(s) for the requested exception. A Curtailment Service Provider shall not submit a request for an exception to the default 30 minute notification period unless it has done its due diligence to confirm that the Demand Resource Registration is physically incapable of responding within that timeframe based on one or more of the reasons set forth below and as may be further defined in the PJM Manuals and has obtained detailed data and documentation to support this determination.

In order to establish that a Demand Resource Registration is reasonably expected to be physically unable to reduce load in that timeframe, the Curtailment Service Provider that submitted the Demand Resource Registration must demonstrate that:

- (i) The manufacturing processes for the Demand Resource Registration require gradual reduction to avoid damaging major industrial equipment used in the manufacturing process, or damage to the product generated or feedstock used in the manufacturing process;
- (ii) Transfer of load to back-up generation requires time-intensive manual process taking more than 30 minutes;
- (iii) On-site safety concerns prevent location from implementing reduction plan in less than 30 minutes; or,
- (iv) The Demand Resource Registration is comprised of mass market residential customers or Small Commercial Customers which collectively cannot be notified of a Load Management Event within a 30-minute timeframe due to unavoidable communications latency, in which case the requested notification time shall be no longer than 120 minutes.

The Office of the Interconnection may request data and documentation from the Curtailment Service Provider and such Curtailment Service Provider shall provide to the Office of the Interconnection within three (3) Business Days of a request therefor, a copy of all of the data and documentation supporting the exception request. Failure to provide a timely response to such request shall cause the exception to terminate the following Operating Day.

At its sole option and discretion, the Office of the Interconnection may review the data and documentation provided by the Curtailment Service Provider to determine if the Demand Resource Registration has met one or more of the criteria above. The Office of the Interconnection will notify the Curtailment Service Provider in writing of its determination by no later than ten (10) Business Days after receipt of the data and documentation.

The Curtailment Service Provider shall provide written notification to the Office of the Interconnection of a material change to the facts that supported its exception request within three

(3) Business Days of becoming aware of such material change in facts, and, if the Office of Interconnection determines that the physical limitation criteria above are no longer being met, the Demand Resource Registration shall be subject to the default notification period of 30 minutes immediately upon such determination.

3. The initiation of load reduction, upon the request of the Office of the Interconnection, must be within the authority of the dispatchers of the Party. No additional approvals should be required.

4. The initiation of load reduction upon the request of the Office of the Interconnection is considered a pre-emergency or emergency action and must be implementable prior to a voltage reduction.

5. A Curtailment Service Provider intending to offer for sale or designate for self-supply, a Demand Resource in any RPM Auction, or intending to include a Demand Resource in any FRR Capacity Plan must demonstrate, to PJM's satisfaction, that such resource shall have the capability to provide a reduction in demand, or otherwise control load, on or before the start of the Delivery Year for which such resource is committed. As part of such demonstration, each such Curtailment Service Provider shall submit a Demand Resource Sell Offer Plan in accordance with the standards and procedures set forth in RAA, Schedule 6, section A-1; RAA, Schedule 8.1 (as to FRR Capacity Plans) and the PJM Manuals, no later than 30 days prior to, as applicable, the RPM Auction in which such resource is to be offered, or the deadline for submission of the FRR Capacity Plan in which such resource is to be included. PJM may verify the Curtailment Service Provider's adherence to the Demand Resource Sell Offer Plan at any time. A Curtailment Service Provider with a PJM-approved Demand Resource Sell Offer Plan will be permitted to offer up to the approved Demand Resource quantity into the subject RPM Auction or include such resource in its FRR Capacity Plan.

6. Selection of a Demand Resource in an RPM Auction results in commitment of capacity to the PJM Region. Demand Resources that are so committed must be linked to registrations participating in the Full Program Option or Capacity Only Option of the Emergency Load Response and Pre-Emergency Load Response Program and thus available for dispatch during PJM-declared pre-emergency events and emergency events.

A-1. A Demand Resource Sell Offer Plan shall consist of a completed template document in the form posted on the PJM website, requiring the information set forth below and in the PJM Manuals, and a Demand Resource Officer Certification Form signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification. The Demand Resource Sell Offer Plan must provide information that supports the Demand Resource Provider's intended Demand Resource Sell Offers and demonstrates that the Demand Resources are being offered with the intention that the MW quantity that clears the auction is reasonably expected to be physically delivered through Demand Resource registrations for the relevant Delivery Year. The Demand Resource Sell Offer Plan shall include all Existing Demand Resources and all Planned

Demand Resources that the Demand Resource Provider intends to offer into an RPM Auction or include in an FRR Capacity Plan.

1. Demand Resource Sell Offer Plan Template. The Demand Resource Sell Offer Plan template, in the form provided on the PJM website, shall require the Demand Resource Provider to provide the following information and such other information as specified in the PJM Manuals:

(a) Summary Information. The completed template shall include the Demand Resource Provider's company name, contact information, and the Nominated DR Value in ICAP MWs by Zone/sub-Zone that the Demand Resource Provider intends to offer, stated separately for Existing Demand Resources and Planned Demand Resources. The total Nominated DR Value in MWs for each Zone/sub-Zone shall be the sum of the Nominated DR Value of Existing Demand Resources and the Nominated DR Value of Planned Demand Resources, and shall be the maximum MW amount the Provider intends to offer in the RPM Auction for the indicated Zone/sub-Zone, provided that nothing herein shall preclude the Demand Resource Provider from offering in the auction a lesser amount than the total Nominated DR Value shown in its Demand Resource Sell Offer Plan.

(b) Existing Demand Resources. The Demand Resource Provider shall identify all Existing Demand Resources by identifying end-use customer sites that are currently registered with PJM (even if not registered by such Demand Resource Provider) and that the Demand Resource Provider reasonably expects to have under a contract to reduce load based on PJM dispatch instructions by the start of the auction Delivery Year.

(c) Planned Demand Resources. The Demand Resource Provider shall provide the details of, and key assumptions underlying, the Planned Demand Resource quantities (i.e., all Demand Resource quantities in excess of Existing Demand Resource quantities) contained in the Demand Resource Sell Offer Plan, including:

(i) key program attributes and assumptions used to develop the Planned Demand Resource quantities, including, but not limited to, discussion of:

- method(s) of achieving load reduction at customer site(s);
- equipment to be controlled or installed at customer site(s), if any;
- plan and ability to acquire customers;
- types of customer targeted;
- support of market potential and market share for the target customer base, with adjustments for Existing Demand Resource customers within this market and the potential for

other Demand Resource Providers targeting the same customers; and

- assumptions regarding regulatory approval of program(s), if applicable.

(ii) Zone/sub-Zone information by end-use customer segment for all Nominated DR Values for which an end-use customer site is not identified, to include the number in each segment of end-use customers expected to be registered for the subject Delivery Year, the average Peak Load Contribution per end-use customer for such segment, and the average Nominated DR Value per customer for such segment. End-use customer segments may include residential, commercial, small industrial, medium industrial, and large industrial, as identified and defined in the PJM Manuals, provided that nothing herein or in the Manuals shall preclude the Provider from identifying more specific customer segments within the commercial and industrial categories, if known.

(iii) Information by end-use customer site to the extent required by subsection A-1(1)(c)(iv) or, if not required by such subsection, to the extent known at the time of the submittal of the Demand Resource Sell Offer Plan, to include: customer EDC account number (if known), customer name, customer premise address, Zone/sub-Zone in which the customer is located, end-use customer segment, current Peak Load Contribution value (or an estimate if actual value not known) and an estimate of expected Peak Load Contribution for the subject Delivery Year, and an estimated Nominated DR Value.

(iv) End-use customer site-specific information shall be required for any Zones or sub-Zones identified by PJM pursuant to this subsection for the portion, if any, of a Demand Resource Provider's intended offer in such Zones or sub-Zones that exceeds a Sell Offer threshold determined pursuant to this subsection, as any such excess quantity under such conditions should reflect Planned Demand Resources from end-use customer sites that the Provider has a high degree of certainty it will physically deliver for the subject Delivery Year. In accordance with the procedures in subsection A-1(3) below, PJM shall identify, as requiring site-specific information, all Zones and sub-Zones that comprise any LDA group (from a list of LDA groups stated in the PJM Manuals) in which [the quantity of cleared Demand Resources from the most recent Base Residual Auction] plus [the quantity of Demand Resources included in FRR Capacity Plans for the Delivery Year addressed by the most recent Base Residual Auction] in any Zone or sub-Zone of such LDA group exceeds the greater of:

- the maximum Demand Resources quantity registered with PJM for such Zone for any Delivery Year from the current

(at time of plan submission) Delivery Year and the two preceding Delivery Years; and

- the potential Demand Resource quantity for such Zone estimated by PJM based on an independent published assessment of demand response potential that is reasonably applicable to such Zone, as identified in the PJM Manuals.

For each such Zone and sub-Zone, the Sell Offer threshold for each Demand Resource Provider shall be the higher of:

- the Demand Resource Provider's maximum Demand Resource quantity registered with PJM for such Zone/sub-Zone over the current Delivery Year (at the time of plan submission) and two preceding Delivery Years;
- the Demand Resource Provider's maximum for any single Delivery Year of [such provider's cleared Demand Resource quantity] plus [such provider's quantity of Demand Resources included in FRR Capacity Plans] from the three forward Delivery Years addressed by the three most recent Base Residual Auctions for such Zone/sub-Zone; and
- 10 MW.

(d) Schedule. The Demand Resource Provider shall provide an approximate timeline for procuring end-use customer sites as needed to physically deliver the total Nominated DR Value (for both Existing Demand Resources and Planned Demand Resources) by Zone/sub-Zone in the Demand Resource Sell Offer Plan. The Demand Resource Provider must specify the cumulative number of customers and the cumulative Nominated DR Value associated with each end-use customer segment within each Zone/sub-Zone that the Demand Resource Provider expects (at the time of plan submission) to have under contract as of June 1 each year between the time of the auction and the subject Delivery Year.

2. Demand Resource Officer Certification Form. Each Demand Resource Sell Offer Plan must include a Demand Resource Officer Certification, signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification, in the form shown in the PJM Manuals, which form shall include the following certifications:

(a) that the signing officer has reviewed the Demand Resource Sell Offer Plan and the information supplied to PJM in support of the Plan is true and correct as of the date of the certification;

(b) that the Sell Offer Plan does not include any Critical Natural Gas Infrastructure facilities, and

(c) that the Demand Resource Provider is submitting the Plan with the reasonable expectation, based upon its analyses as of the date of the certification, to physically deliver all megawatts that clear the RPM Auction through Demand Resource registrations by the specified Delivery Year.

As set forth in the form provided in the PJM Manuals, the certification shall specify that it does not in any way abridge, expand, or otherwise modify the current provisions of the PJM Tariff, Operating Agreement and/or RAA, or the Demand Resource Provider's rights and obligations thereunder, including the Demand Resource Provider's ability to adjust capacity obligations through participation in PJM incremental auctions and bilateral transactions.

3. Procedures. No later than December 1 prior to the Base Residual Auction for a Delivery Year, PJM shall post to the PJM website a list of Zones and sub-Zones, if any, for which end-use customer site-specific information shall be required under the conditions specified in subsection A-1(1)(c)(iv) above for all RPM Auctions conducted for such Delivery Year. Once so identified, a Zone or sub-Zone shall remain on the list for future Delivery Years until the threshold determined under subsection A-1(1)(c)(iv) above is not exceeded for three consecutive Delivery Years. No later than 30 days prior to the RPM Auction in which a Demand Resource Provider intends to offer a Demand Resource, the Demand Resource Provider shall submit to PJM a completed Demand Resource Sell Offer Plan template and a Demand Resource Officer Certification Form signed by a duly authorized officer of the Provider. PJM will review all submitted DR Sell Offer Plans. No later than 10 Business Days prior to the subject RPM Auction, PJM shall notify any Demand Resource Providers that have identified the same end-use customer site(s) in their respective DR Sell Offer Plans for the same Delivery Year. In such event, the MWs associated with such site(s) will not be approved for inclusion in a Sell Offer in an RPM Auction by any of the Demand Resource Providers, unless a Demand Resource Provider provides a letter of support from the end-use customer indicating that it is likely to execute a contract with that Demand Resource Provider for the relevant Delivery Year, or provides other comparable evidence of likely commitment. Such letter of support or other supporting evidence must be provided to PJM no later than 7 Business Days prior to the subject RPM Auction. If an end-use customer provides letters of support for the same site for the same Delivery Year to multiple Demand Resource Providers, the MWs associated with such end-use customer site shall not be approved as a Demand Resource for any of the Demand Resource Providers. No later than 5 Business Days prior to the subject RPM Auction, PJM will notify each Demand Resource Provider of the approved Demand Resource quantity, by Zone/sub-Zone, that such Demand Resource Provider is permitted to offer into such RPM Auction.

- B. The Unforced Capacity value of a Demand Resource will be determined as:
- (1) for Delivery Years through the 2024/2025 Delivery Year, as the product of the Nominated Value of the Demand Resource times the Forecast Pool Requirement. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.
- (2) for the 2025/2026 Delivery Year and subsequent Delivery Years, in accordance with RAA, Schedule 9.2. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.
- C. Demand Resources offered and cleared in a Base Residual or Incremental Auction shall receive the corresponding Capacity Resource Clearing Price as determined in such auction, in accordance with Tariff, Attachment DD. For Delivery Years beginning with the Delivery Year that commences on June 1, 2013, any Demand Resources located in a Zone with multiple LDAs shall receive the Capacity Resource Clearing Price applicable to the location of such resource within such Zone, as identified in such resource's offer. Further, the Curtailment Service Provider shall register its resource in the same location within the Zone as specified in its cleared sell offer, and shall be subject to deficiency charges under Tariff, Attachment DD to the extent it fails to provide the resource in such location consistent with its cleared offer.
- D. The Party, Electric Distributor, or Curtailment Service Provider that establishes a contractual relationship (by contract or tariff rate) with a customer for load reductions is entitled to receive the compensation specified in section C for a committed Demand Resource, notwithstanding that such provider is not the customer's energy supplier.
- E. Any Party hereto shall demonstrate that its Demand Resources performed during periods when load management procedures were invoked by the Office of the Interconnection. The Office of the Interconnection shall adopt and maintain rules and procedures for verifying the performance of such resources, as set forth in section K hereof and the PJM Manuals. In addition, committed Demand Resources that do not comply with the directions of the Office of the Interconnection to reduce load during an emergency shall be subject to the penalty charge set forth in Tariff, Attachment DD.
- F. Parties may elect to place Demand Resources associated with Behind The Meter Generation under the direction of the Office of the Interconnection for a Delivery Year by submitting a Sell Offer for such resource (as Self Supply, or with an offer price) in the Base Residual Auction for such Delivery Year. This election shall remain in effect for the entirety of such Delivery Year. In the event such an election is made, such Behind The Meter Generation will not be netted from load for the purposes of calculating the Daily Unforced Capacity Obligations under this Agreement.
- G. PJM measures Demand Resource Registrations in the following ways:

Firm Service Level (FSL) – Load management achieved by an end-use customer reducing its load to a pre-determined level (the Firm Service Level), upon notification from the Curtailment Service Provider’s market operations center or its agent.

Guaranteed Load Drop (GLD) – Load management achieved by an end-use customer reducing its load by a pre-determined amount (the Guaranteed Load Drop), upon notification from the Curtailment Service Provider’s market operations center or its agent. Typically, the load reduction is achieved through running customer-owned backup generators, or by shutting down process equipment.

H. Each Curtailment Service Provider must satisfy (or contract with another LSE, Curtailment Service Provider, or electric distribution company to provide) the following requirements:

- A point of contact with appropriate backup to ensure single call notification from PJM and timely execution of the notification process;
- Supplemental status reports, detailing Demand Resources available, as requested by PJM;
- Entry of customer-specific Demand Resource Registration information, for planning and verification purposes, into the designated PJM electronic system.
- Customer-specific compliance and verification information for each PJM-initiated Demand Resource event or test event, as well as aggregated Provider load drop data for Provider-initiated events, in accordance with established reporting guidelines.
- Load drop estimates for all Load Management events and test events, prepared in accordance with the PJM Manuals.

I. The Nominated Values (summer or winter) for each Demand Resource Registration shall be determined consistent with the process described below.

The summer Nominated Value for Firm Service Level customer(s) on a registration will be based on the peak load contribution for the customer(s), as typically determined by the 5CP methodology utilized by the electric distribution company to determine ICAP obligation values. The summer Nominated Value for a registration shall equal the total peak load contribution for the customers on the registration minus the summer Firm Service Level multiplied by the loss factor. The winter Nominated Value for Firm Service Level customer(s) on a registration shall equal the total Winter Peak Load for customers on the registration multiplied by Zonal Winter Weather Adjustment Factor minus winter Firm Service level and then the result is multiplied by the loss factor.

The summer Nominated Value for a Guaranteed Load Drop customer on a registration shall equal the summer guaranteed load drop amount, adjusted for system losses and shall not exceed the customer’s Peak Load Contribution, as established by the

customer's contract with the Curtailment Service Provider. The winter Nominated Value for a Guaranteed Load Drop customer on a registration shall be the winter guaranteed load drop amount, adjusted for system losses, and shall not exceed the customer's Winter Peak Load multiplied by Zonal Winter Weather Adjustment Factor multiplied by the loss factor, as established by the customer's contract with the Curtailment Service Provider.

Customer-specific Demand Resource Registration information (EDC account number, peak load contribution, Winter Peak Load, notification period, etc.) will be entered into the designated PJM electronic system to establish nominated values. Each Demand Resource Registration should be linked to a Demand Resource. Additional data may be required, as defined in sections J and K and the PJM Manuals.

- J. Nominated Values shall be reviewed based on documentation of customer-specific data and Demand Resource Registration information, to verify the amount of load management available and to set a summer or winter Nominated Value. Data is provided by both the zone EDC and the Curtailment Service Provider in the designated PJM electronic system, and must include the EDC meter number or other unique customer identifier, Peak Load Contribution (5CP), Winter Peak Load, contract firm service level or guaranteed load drop values, applicable loss factor, zone/area location of the load drop, number of active participants, etc. Such data must be uploaded and approved prior to the first day of the Delivery Year for which such Demand Resource Registration is effective. Curtailment Service Providers must provide this information concurrently to host EDCs.

For Firm Service Level and Guaranteed Load Drop customers, the 5CP values, for the zone and affected customers, will be adjusted to reflect an "unrestricted" peak for a zone, based on information provided by the Curtailment Service Provider. Load drop levels shall be estimated in accordance with guidelines in the PJM Manuals.

The daily Nominated Value of a Demand Resource with a Capacity Performance commitment (which may consist of an Annual Demand Resource with a Capacity Performance commitment and/or Summer Period Demand Resource with a Capacity Performance commitment) shall equal the sum of the summer Nominated Values of the registrations linked to such Demand Resource for the summer period of June through October and May of the Delivery Year, and shall equal the lesser of (i) the sum of the summer Nominated Values of the registrations linked to such Demand Resource or (ii) the sum of the winter Nominated Values of the registrations linked to such Demand Resource for the non-summer period of November through April of the Delivery Year.

- K. Compliance is the process utilized to review Provider performance during PJM-initiated Load Management events and tests. Compliance will be established for each Provider on an event specific basis for the Curtailment Service Provider's Demand Resource Registrations dispatched by the Office of the Interconnection during such event. PJM will establish and communicate reasonable deadlines for the timely submittal of event data to expedite compliance reviews. Compliance reviews will be completed as soon after the event as possible, with the expectation that reviews of a single event will be completed within two months of the end of the month in which the event took place.

Curtailed Service Providers are responsible for the submittal of compliance information to PJM for each PJM-initiated event and test during the compliance period.

Compliance is measured for Market Participant Bonus Performance, as applicable, and Non-Performance Charges. Non-Performance Charges are assessed for the defined obligation period of each Demand Resource as defined in RAA, Article 1, subject to the following requirements:

Compliance is checked on an individual customer basis for Firm Service Level, by comparing actual load during the event to the firm service level. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Curtailed Service Providers must submit actual customer load levels (for the event period) for the compliance report. Compliance for FSL will be based on:

Summer (June through October and the following May of a Delivery Year)- End use customer's current Delivery Year peak load contribution ("PLC") minus the metered load ("Load") multiplied by the loss factor ("LF"). The calculation is represented by:

$$(PLC) - (Load * LF)$$

Winter (November through April of a Delivery Year)- End use customer's Winter Peak Load ("WPL") multiplied by Zonal Winter Weather Adjustment Factor ("ZWWAF") multiplied by LF, minus the metered load ("Load") multiplied by the LF. The calculation is represented by:

$$(WPL * ZWWAF * LF) - (Load * LF)$$

Compliance is checked on an individual customer basis for Guaranteed Load Drop. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Guaranteed Load Drop compliance will be based on:

- (i) the lesser of (a) comparison load used to best represent what the load would have been if PJM did not declare a Load Management Event or the CSP did not initiate a test as outlined in the PJM Manuals, minus the Load and then multiplied by the LF, or (b) For a summer event, the PLC minus the Load multiplied by the LF. A summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the PLC. For a non-summer event, the WPL multiplied the ZWWAF multiplied by LF, minus the Load multiplied by the LF. A non-summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the WPL multiplied by the ZWWAF multiplied by LF.

- (ii) Curtailment Service Providers must submit actual loads and comparison loads for all hours during the day of the Load Management Event or the Load Management performance test, and for all hours during any other days as required by the Office of the Interconnection to calculate the load reduction. Comparison loads must be developed from the guidelines in the PJM Manuals, and note which method was employed.
- (iii) Methodologies for establishing comparison load for Guaranteed Load Drop end-use customers are described in greater detail in Manual M-19, PJM Manual for Load Forecasting and Analysis, at Attachment A: Load Drop Estimate Guidelines.

Load reduction compliance is determined on an hourly basis for a Demand Resource Registration linked to an Annual Demand Resource with a Capacity Performance commitment, for each FSL and GLD customer dispatched by the Office of the Interconnection for at least 30 minutes of the clock hour (i.e., “partial dispatch compliance hour”). Curtailment Service Provider may submit 1 minute load data for use in capacity compliance calculations for partial dispatch compliance hours subject to PJM approval and in accordance with the PJM Manuals where: (a) metering meets all Tariff and Manual requirements, (b) 1 minute load data shall be submitted to PJM for all locations on the registration, and (c) 1 minute load data measures energy consumption over the minute. The registered capacity commitment for a Demand Resource Registration with a Base or Capacity Performance commitment is not prorated based on the number of minutes dispatched during the clock hours. The actual hourly load reduction for the hour ending that includes a Performance Assessment Interval(s) is flat-profiled over the set of dispatch intervals in the hour in accordance with the PJM Manuals.

A Demand Resource Registration may not reduce their load below zero (i.e., export energy into the system). No compliance credit will be given for an incremental load drop below zero.

For a Performance Assessment Interval, compliance will be totaled over all dispatched registrations for FSL and GLD customers linked to a Provider’s Annual Demand Resource with a Capacity Performance commitment to determine the Actual Performance for such Demand Resource in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals. The Expected Performance for such Demand Resource shall be equal to the Provider’s committed capacity on the Demand Resource, adjusted to account for any linked registrations that were not dispatched by PJM. A Provider’s Demand Resources’ initial Performance Shortfalls shall be netted for all the seller’s Demand Resources in the Emergency Action Area to determine a net Emergency Action Area Performance Shortfall which is then allocated to the Capacity Market Seller’s Demand Resources in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals.

- L. Energy Efficiency Resources – all provisions in RAA, Schedule 6, section L and Tariff, Attachment DD-1, section L shall be effective only through the 2025/2026 Delivery Year. Thereafter, no Energy Efficiency Resources shall qualify to be offered into the RPM Auctions beginning with the 2026/2027 Delivery Year.

1. An Energy Efficiency Resource is a project, including installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards, designed to achieve a continuous (during peak summer and winter periods as described herein) reduction in electric energy consumption at the end-use customer's retail site that is not reflected in the peak load forecast prepared for the Delivery Year for which the Energy Efficiency Resource is proposed, and that is fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.
2. An Energy Efficiency Resource may be offered as a Capacity Resource in the Base Residual or Incremental Auctions for any Delivery Year beginning on or after June 1, 2011. No later than 30 days prior to the auction in which the resource is to be offered, the Capacity Market Seller shall submit to the Office of the Interconnection a notice of intent to offer the resource into such auction and a measurement and verification plan. The notice of intent shall include all pertinent project design data, including but not limited to the peak-load contribution of affected customers, a full description of the equipment, device, system or process intended to achieve the load reduction, the load reduction pattern, the project location, the project development timeline, and any other relevant data. Such notice also shall state the seller's proposed Nominated Energy Efficiency Value.
 - For the 2018/2019 Delivery Year and subsequent Delivery Years and for any Annual Energy Efficiency Resource committed as a Capacity Performance Resource, the seller's proposed Nominated Energy Efficiency Value for any Annual Energy Efficiency Resources, shall be the expected average load reduction, for all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 15:00 EPT and the hour ending 18:00 EPT. In addition, the expected average load reduction for all days from January 1 through February 28, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 8:00 EPT and the hour ending 9:00 EPT and between the hour ending 19:00 EPT and the hour ending 20:00 EPT shall not be less than the Nominated Energy Efficiency Value; and
 - For the 2020/2021 Delivery Year and subsequent Delivery Years, the seller's proposed Nominated Energy Efficiency Value for any Summer-Period Energy Efficiency Resource shall be the expected average load reduction between the hour ending 15:00 EPT and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday.

The measurement and verification plan shall describe the methods and procedures, consistent with the PJM Manuals, for determining the amount of

the load reduction and confirming that such reduction is achieved. The Office of the Interconnection shall determine, upon review of such notice, the Nominated Energy Efficiency Value that may be offered in the Reliability Pricing Model Auction.

3. An Energy Efficiency Resource may be offered with a price offer or as Self-Supply. If an Energy Efficiency Resource clears the auction, it shall receive the applicable Capacity Resource Clearing Price, subject to section 5 below. A Capacity Market Seller offering an Energy Efficiency Resource must comply with all applicable credit requirements as set forth in Tariff, Attachment Q. The Unforced Capacity value of an Energy Efficiency Resource offered into an RPM Auction or committed in a FRR Capacity Plan shall be the Nominated Energy Efficiency Value times the Forecast Pool Requirement.
4. An Energy Efficiency Resource that clears an auction for a Delivery Year may be offered in auctions for up to three additional consecutive Delivery Years, but shall not be assured of clearing in any such auction; provided, however, an Energy Efficiency Resource may not be offered for any Delivery Year in which any part of the peak season is beyond the expected life of the equipment, device, system, or process providing the expected load reduction; and provided further that a Capacity Market Seller that offers and clears an Energy Efficiency Resource in a BRA may elect a New Entry Price Adjustment on the same terms as set forth in Tariff, Attachment DD, section 5.14(c).
5. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than 30 days prior to each Auction an updated project status and measurement and verification plan subject to the criteria set forth in the PJM Manuals.
6. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than the start of such Delivery Year, an updated project status and detailed measurement and verification data meeting the standards for precision and accuracy set forth in the PJM Manuals. The final value of the Energy Efficiency Resource during such Delivery Year shall be as determined by the Office of the Interconnection based on the submitted data.
7. The Office of the Interconnection may audit, at the Capacity Market Seller's expense, any Energy Efficiency Resource committed to the PJM Region. The audit may be conducted any time including the Performance Hours of the Delivery Year.
8. For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, if a Relevant Electric Retail Regulatory Authority receives FERC authorization to qualify or prohibit Energy Efficiency Resource participation in a specific area(s) of the PJM Region, the following process applies:

(a) The Office of the Interconnection will publicly post a reference to the FERC authorization of a Relevant Electric Retail Regulatory Authority order, ordinance or resolution that qualifies or prohibits Energy Efficiency Resource participation, the applicable electric distribution company(ies), and the applicable auction(s) and/or Delivery Year(s).

(b) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all resources that are located in the jurisdiction of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation within the Zone or LDA, as required, and those outside of the area but within the Zone or LDA, as required.

(c) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all Energy Efficiency Resources to be offered as part of its Energy Efficiency measurement and verification plan and certified post-installation measurement and verification report. The Office of Interconnection will provide a list to the relevant electric distribution company for the specific area(s) to review for compliance with the Relevant Electric Retail Regulatory Authority of Capacity Market Sellers that are:

- (i) offering Energy Efficiency Resources in an RPM Auction within two (2) Business Days after the deadline for submitting an energy efficiency measurement and verification plan for such RPM Auction; and
- (ii) certifying Energy Efficiency Resources with a Delivery Year post-installation measurement and verification report, within two (2) Business Days of receipt of such Delivery Year post-installation measurement and verification report. The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource.

(d) The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation and provide a response to the Office of the Interconnection within five (5) Business Days after receiving the list of Capacity Market Sellers offering Energy Efficiency Resources. The Office of the Interconnection will not allow a

Capacity Market Seller to offer or certify Energy Efficiency Resources if an electric distribution company denies such Capacity Market Seller to deliver Energy Efficiency Resources in compliance with rules of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation.

- (9) For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, a Capacity Market Seller of Energy Efficiency Resources that cannot satisfy its RPM obligations in any Delivery Year due to the prohibition of participation by a Relevant Electric Retail Regulatory Authority authorized by FERC to prohibit participation of such resources may be relieved of its Capacity Resource Deficiency Charge by notifying the Office of the Interconnection by no later than seven (7) calendar days prior to the posting of the planning parameters for the Third Incremental Auction of that Delivery Year. After providing such notice, the affected Capacity Market Seller may elect to be relieved of its RPM commitment, and shall not be required to obtain replacement capacity for the resource, and no charges shall be assessed by the Office of the Interconnection for the Capacity Market Seller's deficiency in satisfying its RPM obligation for the resource for such Delivery Year. In such case, however, the Capacity Market Seller shall not be entitled to, nor be paid, any RPM revenues for such resource for that Delivery Year. The Office of the Interconnection will apply corresponding adjustments to the quantity of Buy Bids or Sell Offers in the Incremental Auctions for such Delivery Years in accordance with Tariff, Attachment DD, sections 5.12(b)(ii) and 5.12(b)(iii).

PJM Reliability Assurance Agreement
(Clean Format)

SCHEDULE 6

PROCEDURES FOR DEMAND RESOURCES AND ENERGY EFFICIENCY

A. Parties can partially or wholly offset the amounts payable for the Locational Reliability Charge with Demand Resources that are operated under the direction of the Office of the Interconnection. FRR Entities may reduce their capacity obligations with Demand Resources that are operated under the direction of the Office of the Interconnection and detailed in such entity's FRR Capacity Plan. Demand Resources qualifying under the criteria set forth below may be offered for sale or designated as Self-Supply in the Base Residual Auction, included in an FRR Capacity Plan, or offered for sale in any Incremental Auction, for any Delivery Year for which such resource qualifies. Qualified Demand Resources generally fall in one of two categories, i.e., Guaranteed Load Drop or Firm Service Level, as further specified in section G below and the PJM Manuals. Qualified Demand Resources may be provided by a Curtailment Service Provider, notwithstanding that such Curtailment Service Provider is not a Party to this Agreement. Such Curtailment Service Providers must satisfy the requirements hereof and the PJM Manuals.

1. A Party must formally notify, in accordance with the requirements of the PJM Manuals and section F hereof, as applicable, the Office of the Interconnection of the Demand Resource Registration that it is placing under the direction of the Office of the Interconnection. A Party must further notify the Office of the Interconnection whether the Demand Resource Registration is linked to a Summer-Period Demand Resource or an Annual Demand Resource.

2. A Demand Resource Registration must achieve its full load reduction within the following time period:

(a) For the 2015/2016 Delivery Year and subsequent Delivery Years, a Demand Resource Registration must be able to fully respond to a Load Management Event within 30 minutes of notification from the Office of the Interconnection. This default 30 minute prior notification shall apply unless a Curtailment Service Provider obtains an exception from the Office of the Interconnection due to physical operational limitations that prevent the Demand Resource Registration from reducing load within that timeframe. In such case, the Curtailment Service Provider shall submit a request for an exception to the 30 minute prior notification requirement to the Office of the Interconnection, at the time the Registration Form for that Demand Resource Registration is submitted in accordance with Tariff, Attachment K-Appendix. The only alternative notification times that the Office of Interconnection will permit, upon approval of an exception request, are 60 minutes and 120 minutes prior to a Load Management Event. The Curtailment Service Provider shall indicate in writing, in the appropriate application, that it seeks an exception to permit a prior notification time of 60 minutes or 120 minutes, and the reason(s) for the requested exception. A Curtailment Service Provider shall not submit a request for an exception to the default 30 minute notification period unless it has done its due diligence to confirm that the Demand

Resource Registration is physically incapable of responding within that timeframe based on one or more of the reasons set forth below and as may be further defined in the PJM Manuals and has obtained detailed data and documentation to support this determination.

In order to establish that a Demand Resource Registration is reasonably expected to be physically unable to reduce load in that timeframe, the Curtailment Service Provider that submitted the Demand Resource Registration must demonstrate that:

- (i) The manufacturing processes for the Demand Resource Registration require gradual reduction to avoid damaging major industrial equipment used in the manufacturing process, or damage to the product generated or feedstock used in the manufacturing process;
- (ii) Transfer of load to back-up generation requires time-intensive manual process taking more than 30 minutes;
- (iii) On-site safety concerns prevent location from implementing reduction plan in less than 30 minutes; or,
- (iv) The Demand Resource Registration is comprised of mass market residential customers or Small Commercial Customers which collectively cannot be notified of a Load Management Event within a 30-minute timeframe due to unavoidable communications latency, in which case the requested notification time shall be no longer than 120 minutes.

The Office of the Interconnection may request data and documentation from the Curtailment Service Provider and such Curtailment Service Provider shall provide to the Office of the Interconnection within three (3) Business Days of a request therefor, a copy of all of the data and documentation supporting the exception request. Failure to provide a timely response to such request shall cause the exception to terminate the following Operating Day.

At its sole option and discretion, the Office of the Interconnection may review the data and documentation provided by the Curtailment Service Provider to determine if the Demand Resource Registration has met one or more of the criteria above. The Office of the Interconnection will notify the Curtailment Service Provider in writing of its determination by no later than ten (10) Business Days after receipt of the data and documentation.

The Curtailment Service Provider shall provide written notification to the Office of the Interconnection of a material change to the facts that supported its exception request within three (3) Business Days of becoming aware of such material change in facts, and, if the Office of Interconnection determines that the physical limitation criteria above are no longer being met, the Demand Resource Registration shall be subject to the default notification period of 30 minutes immediately upon such determination.

3. The initiation of load reduction, upon the request of the Office of the Interconnection, must be within the authority of the dispatchers of the Party. No additional approvals should be required.

4. The initiation of load reduction upon the request of the Office of the Interconnection is considered a pre-emergency or emergency action and must be implementable prior to a voltage reduction.

5. A Curtailment Service Provider intending to offer for sale or designate for self-supply, a Demand Resource in any RPM Auction, or intending to include a Demand Resource in any FRR Capacity Plan must demonstrate, to PJM's satisfaction, that such resource shall have the capability to provide a reduction in demand, or otherwise control load, on or before the start of the Delivery Year for which such resource is committed. As part of such demonstration, each such Curtailment Service Provider shall submit a Demand Resource Sell Offer Plan in accordance with the standards and procedures set forth in RAA, Schedule 6, section A-1; RAA, Schedule 8.1 (as to FRR Capacity Plans) and the PJM Manuals, no later than 30 days prior to, as applicable, the RPM Auction in which such resource is to be offered, or the deadline for submission of the FRR Capacity Plan in which such resource is to be included. PJM may verify the Curtailment Service Provider's adherence to the Demand Resource Sell Offer Plan at any time. A Curtailment Service Provider with a PJM-approved Demand Resource Sell Offer Plan will be permitted to offer up to the approved Demand Resource quantity into the subject RPM Auction or include such resource in its FRR Capacity Plan.

6. Selection of a Demand Resource in an RPM Auction results in commitment of capacity to the PJM Region. Demand Resources that are so committed must be linked to registrations participating in the Full Program Option or Capacity Only Option of the Emergency Load Response and Pre-Emergency Load Response Program and thus available for dispatch during PJM-declared pre-emergency events and emergency events.

A-1. A Demand Resource Sell Offer Plan shall consist of a completed template document in the form posted on the PJM website, requiring the information set forth below and in the PJM Manuals, and a Demand Resource Officer Certification Form signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification. The Demand Resource Sell Offer Plan must provide information that supports the Demand Resource Provider's intended Demand Resource Sell Offers and demonstrates that the Demand Resources are being offered with the intention that the MW quantity that clears the auction is reasonably expected to be physically delivered through Demand Resource registrations for the relevant Delivery Year. The Demand Resource Sell Offer Plan shall include all Existing Demand Resources and all Planned Demand Resources that the Demand Resource Provider intends to offer into an RPM Auction or include in an FRR Capacity Plan.

1. Demand Resource Sell Offer Plan Template. The Demand Resource Sell Offer Plan template, in the form provided on the PJM website, shall require the

Demand Resource Provider to provide the following information and such other information as specified in the PJM Manuals:

(a) Summary Information. The completed template shall include the Demand Resource Provider's company name, contact information, and the Nominated DR Value in ICAP MWs by Zone/sub-Zone that the Demand Resource Provider intends to offer, stated separately for Existing Demand Resources and Planned Demand Resources. The total Nominated DR Value in MWs for each Zone/sub-Zone shall be the sum of the Nominated DR Value of Existing Demand Resources and the Nominated DR Value of Planned Demand Resources, and shall be the maximum MW amount the Provider intends to offer in the RPM Auction for the indicated Zone/sub-Zone, provided that nothing herein shall preclude the Demand Resource Provider from offering in the auction a lesser amount than the total Nominated DR Value shown in its Demand Resource Sell Offer Plan.

(b) Existing Demand Resources. The Demand Resource Provider shall identify all Existing Demand Resources by identifying end-use customer sites that are currently registered with PJM (even if not registered by such Demand Resource Provider) and that the Demand Resource Provider reasonably expects to have under a contract to reduce load based on PJM dispatch instructions by the start of the auction Delivery Year.

(c) Planned Demand Resources. The Demand Resource Provider shall provide the details of, and key assumptions underlying, the Planned Demand Resource quantities (i.e., all Demand Resource quantities in excess of Existing Demand Resource quantities) contained in the Demand Resource Sell Offer Plan, including:

(i) key program attributes and assumptions used to develop the Planned Demand Resource quantities, including, but not limited to, discussion of:

- method(s) of achieving load reduction at customer site(s);
- equipment to be controlled or installed at customer site(s), if any;
- plan and ability to acquire customers;
- types of customer targeted;
- support of market potential and market share for the target customer base, with adjustments for Existing Demand Resource customers within this market and the potential for other Demand Resource Providers targeting the same customers; and
- assumptions regarding regulatory approval of program(s), if applicable.

(ii) Zone/sub-Zone information by end-use customer segment for all Nominated DR Values for which an end-use customer site is not identified, to include the number in each segment of end-use customers expected to be registered for the subject Delivery Year, the average Peak Load Contribution per end-use customer for such segment, and the average Nominated DR Value per customer for such segment. End-use customer segments may include residential, commercial, small industrial, medium industrial, and large industrial, as identified and defined in the PJM Manuals, provided that nothing herein or in the Manuals shall preclude the Provider from identifying more specific customer segments within the commercial and industrial categories, if known.

(iii) Information by end-use customer site to the extent required by subsection A-1(1)(c)(iv) or, if not required by such subsection, to the extent known at the time of the submittal of the Demand Resource Sell Offer Plan, to include: customer EDC account number (if known), customer name, customer premise address, Zone/sub-Zone in which the customer is located, end-use customer segment, current Peak Load Contribution value (or an estimate if actual value not known) and an estimate of expected Peak Load Contribution for the subject Delivery Year, and an estimated Nominated DR Value.

(iv) End-use customer site-specific information shall be required for any Zones or sub-Zones identified by PJM pursuant to this subsection for the portion, if any, of a Demand Resource Provider's intended offer in such Zones or sub-Zones that exceeds a Sell Offer threshold determined pursuant to this subsection, as any such excess quantity under such conditions should reflect Planned Demand Resources from end-use customer sites that the Provider has a high degree of certainty it will physically deliver for the subject Delivery Year. In accordance with the procedures in subsection A-1(3) below, PJM shall identify, as requiring site-specific information, all Zones and sub-Zones that comprise any LDA group (from a list of LDA groups stated in the PJM Manuals) in which [the quantity of cleared Demand Resources from the most recent Base Residual Auction] plus [the quantity of Demand Resources included in FRR Capacity Plans for the Delivery Year addressed by the most recent Base Residual Auction] in any Zone or sub-Zone of such LDA group exceeds the greater of:

- the maximum Demand Resources quantity registered with PJM for such Zone for any Delivery Year from the current (at time of plan submission) Delivery Year and the two preceding Delivery Years; and

- the potential Demand Resource quantity for such Zone estimated by PJM based on an independent published assessment of demand response potential that is reasonably applicable to such Zone, as identified in the PJM Manuals.

For each such Zone and sub-Zone, the Sell Offer threshold for each Demand Resource Provider shall be the higher of:

- the Demand Resource Provider's maximum Demand Resource quantity registered with PJM for such Zone/sub-Zone over the current Delivery Year (at the time of plan submission) and two preceding Delivery Years;
- the Demand Resource Provider's maximum for any single Delivery Year of [such provider's cleared Demand Resource quantity] plus [such provider's quantity of Demand Resources included in FRR Capacity Plans] from the three forward Delivery Years addressed by the three most recent Base Residual Auctions for such Zone/sub-Zone; and
- 10 MW.

(d) Schedule. The Demand Resource Provider shall provide an approximate timeline for procuring end-use customer sites as needed to physically deliver the total Nominated DR Value (for both Existing Demand Resources and Planned Demand Resources) by Zone/sub-Zone in the Demand Resource Sell Offer Plan. The Demand Resource Provider must specify the cumulative number of customers and the cumulative Nominated DR Value associated with each end-use customer segment within each Zone/sub-Zone that the Demand Resource Provider expects (at the time of plan submission) to have under contract as of June 1 each year between the time of the auction and the subject Delivery Year.

2. Demand Resource Officer Certification Form. Each Demand Resource Sell Offer Plan must include a Demand Resource Officer Certification, signed by an officer of the Demand Resource Provider that is duly authorized to provide such a certification, in the form shown in the PJM Manuals, which form shall include the following certifications:

(a) that the signing officer has reviewed the Demand Resource Sell Offer Plan and the information supplied to PJM in support of the Plan is true and correct as of the date of the certification;

(b) that the Sell Offer Plan does not include any Critical Natural Gas Infrastructure facilities, and

(c) that the Demand Resource Provider is submitting the Plan with the reasonable expectation, based upon its analyses as of the date of the certification, to physically deliver all megawatts that clear the RPM Auction through Demand Resource registrations by the specified Delivery Year.

As set forth in the form provided in the PJM Manuals, the certification shall specify that it does not in any way abridge, expand, or otherwise modify the current provisions of the PJM Tariff, Operating Agreement and/or RAA, or the Demand Resource Provider's rights and obligations thereunder, including the Demand Resource Provider's ability to adjust capacity obligations through participation in PJM incremental auctions and bilateral transactions.

3. Procedures. No later than December 1 prior to the Base Residual Auction for a Delivery Year, PJM shall post to the PJM website a list of Zones and sub-Zones, if any, for which end-use customer site-specific information shall be required under the conditions specified in subsection A-1(1)(c)(iv) above for all RPM Auctions conducted for such Delivery Year. Once so identified, a Zone or sub-Zone shall remain on the list for future Delivery Years until the threshold determined under subsection A-1(1)(c)(iv) above is not exceeded for three consecutive Delivery Years. No later than 30 days prior to the RPM Auction in which a Demand Resource Provider intends to offer a Demand Resource, the Demand Resource Provider shall submit to PJM a completed Demand Resource Sell Offer Plan template and a Demand Resource Officer Certification Form signed by a duly authorized officer of the Provider. PJM will review all submitted DR Sell Offer Plans. No later than 10 Business Days prior to the subject RPM Auction, PJM shall notify any Demand Resource Providers that have identified the same end-use customer site(s) in their respective DR Sell Offer Plans for the same Delivery Year. In such event, the MWs associated with such site(s) will not be approved for inclusion in a Sell Offer in an RPM Auction by any of the Demand Resource Providers, unless a Demand Resource Provider provides a letter of support from the end-use customer indicating that it is likely to execute a contract with that Demand Resource Provider for the relevant Delivery Year, or provides other comparable evidence of likely commitment. Such letter of support or other supporting evidence must be provided to PJM no later than 7 Business Days prior to the subject RPM Auction. If an end-use customer provides letters of support for the same site for the same Delivery Year to multiple Demand Resource Providers, the MWs associated with such end-use customer site shall not be approved as a Demand Resource for any of the Demand Resource Providers. No later than 5 Business Days prior to the subject RPM Auction, PJM will notify each Demand Resource Provider of the approved Demand Resource quantity, by Zone/sub-Zone, that such Demand Resource Provider is permitted to offer into such RPM Auction.

B. The Unforced Capacity value of a Demand Resource will be determined:

(1) for Delivery Years through the 2024/2025 Delivery Year, as the product of the Nominated Value of the Demand Resource times the Forecast Pool Requirement. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.

(2) for the 2025/2026 Delivery Year and subsequent Delivery Years, in accordance with RAA, Schedule 9.2. Nominated Values shall be determined and reviewed in accordance with sections I and J, respectively, and the PJM Manuals.

- C. Demand Resources offered and cleared in a Base Residual or Incremental Auction shall receive the corresponding Capacity Resource Clearing Price as determined in such auction, in accordance with Tariff, Attachment DD. For Delivery Years beginning with the Delivery Year that commences on June 1, 2013, any Demand Resources located in a Zone with multiple LDAs shall receive the Capacity Resource Clearing Price applicable to the location of such resource within such Zone, as identified in such resource's offer. Further, the Curtailment Service Provider shall register its resource in the same location within the Zone as specified in its cleared sell offer, and shall be subject to deficiency charges under Tariff, Attachment DD to the extent it fails to provide the resource in such location consistent with its cleared offer.
- D. The Party, Electric Distributor, or Curtailment Service Provider that establishes a contractual relationship (by contract or tariff rate) with a customer for load reductions is entitled to receive the compensation specified in section C for a committed Demand Resource, notwithstanding that such provider is not the customer's energy supplier.
- E. Any Party hereto shall demonstrate that its Demand Resources performed during periods when load management procedures were invoked by the Office of the Interconnection. The Office of the Interconnection shall adopt and maintain rules and procedures for verifying the performance of such resources, as set forth in section K hereof and the PJM Manuals. In addition, committed Demand Resources that do not comply with the directions of the Office of the Interconnection to reduce load during an emergency shall be subject to the penalty charge set forth in Tariff, Attachment DD.
- F. Parties may elect to place Demand Resources associated with Behind The Meter Generation under the direction of the Office of the Interconnection for a Delivery Year by submitting a Sell Offer for such resource (as Self Supply, or with an offer price) in the Base Residual Auction for such Delivery Year. This election shall remain in effect for the entirety of such Delivery Year. In the event such an election is made, such Behind The Meter Generation will not be netted from load for the purposes of calculating the Daily Unforced Capacity Obligations under this Agreement.
- G. PJM measures Demand Resource Registrations in the following ways:
 - Firm Service Level (FSL) – Load management achieved by an end-use customer reducing its load to a pre-determined level (the Firm Service Level), upon notification from the Curtailment Service Provider's market operations center or its agent.

Guaranteed Load Drop (GLD) – Load management achieved by an end-use customer reducing its load by a pre-determined amount (the Guaranteed Load Drop), upon notification from the Curtailment Service Provider’s market operations center or its agent. Typically, the load reduction is achieved through running customer-owned backup generators, or by shutting down process equipment.

H. Each Curtailment Service Provider must satisfy (or contract with another LSE, Curtailment Service Provider, or electric distribution company to provide) the following requirements:

- A point of contact with appropriate backup to ensure single call notification from PJM and timely execution of the notification process;
- Supplemental status reports, detailing Demand Resources available, as requested by PJM;
- Entry of customer-specific Demand Resource Registration information, for planning and verification purposes, into the designated PJM electronic system.
- Customer-specific compliance and verification information for each PJM-initiated Demand Resource event or test event, as well as aggregated Provider load drop data for Provider-initiated events, in accordance with established reporting guidelines.
- Load drop estimates for all Load Management events and test events, prepared in accordance with the PJM Manuals.

I. The Nominated Values (summer or winter) for each Demand Resource Registration shall be determined consistent with the process described below.

The summer Nominated Value for Firm Service Level customer(s) on a registration will be based on the peak load contribution for the customer(s), as typically determined by the 5CP methodology utilized by the electric distribution company to determine ICAP obligation values. The summer Nominated Value for a registration shall equal the total peak load contribution for the customers on the registration minus the summer Firm Service Level multiplied by the loss factor. The winter Nominated Value for Firm Service Level customer(s) on a registration shall equal the total Winter Peak Load for customers on the registration multiplied by Zonal Winter Weather Adjustment Factor minus winter Firm Service level and then the result is multiplied by the loss factor.

The summer Nominated Value for a Guaranteed Load Drop customer on a registration shall equal the summer guaranteed load drop amount, adjusted for system losses and shall not exceed the customer’s Peak Load Contribution, as established by the customer’s contract with the Curtailment Service Provider. The winter Nominated Value for a Guaranteed Load Drop customer on a registration shall be the winter guaranteed load drop amount, adjusted for system losses, and shall not exceed the customer’s Winter

Peak Load multiplied by Zonal Winter Weather Adjustment Factor multiplied by the loss factor, as established by the customer's contract with the Curtailment Service Provider.

Customer-specific Demand Resource Registration information (EDC account number, peak load contribution, Winter Peak Load, notification period, etc.) will be entered into the designated PJM electronic system to establish nominated values. Each Demand Resource Registration should be linked to a Demand Resource. Additional data may be required, as defined in sections J and K and the PJM Manuals.

- J. Nominated Values shall be reviewed based on documentation of customer-specific data and Demand Resource Registration information, to verify the amount of load management available and to set a summer or winter, Nominated Value. Data is provided by both the zone EDC and the Curtailment Service Provider in the designated PJM electronic system, and must include the EDC meter number or other unique customer identifier, Peak Load Contribution (5CP), Winter Peak Load, contract firm service level or guaranteed load drop values, applicable loss factor, zone/area location of the load drop, number of active participants, etc. Such data must be uploaded and approved prior to the first day of the Delivery Year for which such Demand Resource Registration is effective. Curtailment Service Providers must provide this information concurrently to host EDCs.

For Firm Service Level and Guaranteed Load Drop customers, the 5CP values, for the zone and affected customers, will be adjusted to reflect an "unrestricted" peak for a zone, based on information provided by the Curtailment Service Provider. Load drop levels shall be estimated in accordance with guidelines in the PJM Manuals.

The daily Nominated Value of a Demand Resource with a Capacity Performance commitment (which may consist of an Annual Demand Resource with a Capacity Performance commitment and/or Summer Period Demand Resource with a Capacity Performance commitment) shall equal the sum of the summer Nominated Values of the registrations linked to such Demand Resource for the summer period of June through October and May of the Delivery Year, and shall equal the lesser of (i) the sum of the summer Nominated Values of the registrations linked to such Demand Resource or (ii) the sum of the winter Nominated Values of the registrations linked to such Demand Resource for the non-summer period of November through April of the Delivery Year.

- K. Compliance is the process utilized to review Provider performance during PJM-initiated Load Management events and tests. Compliance will be established for each Provider on an event specific basis for the Curtailment Service Provider's Demand Resource Registrations dispatched by the Office of the Interconnection during such event. PJM will establish and communicate reasonable deadlines for the timely submittal of event data to expedite compliance reviews. Compliance reviews will be completed as soon after the event as possible, with the expectation that reviews of a single event will be completed within two months of the end of the month in which the event took place. Curtailment Service Providers are responsible for the submittal of compliance information to PJM for each PJM-initiated event and test during the compliance period.

Compliance is measured for Market Participant Bonus Performance, as applicable, and Non-Performance Charges. Non-Performance Charges are assessed for the defined obligation period of each Demand Resource as defined in RAA, Article 1, subject to the following requirements:

Compliance is checked on an individual customer basis for Firm Service Level, by comparing actual load during the event to the firm service level. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Curtailment Service Providers must submit actual customer load levels (for the event period) for the compliance report. Compliance for FSL will be based on:

Summer (June through October and the following May of a Delivery Year)- End use customer's current Delivery Year peak load contribution ("PLC") minus the metered load ("Load") multiplied by the loss factor ("LF"). The calculation is represented by:

$$(PLC) - (Load * LF)$$

Winter (November through April of a Delivery Year)- End use customer's Winter Peak Load ("WPL") multiplied by Zonal Winter Weather Adjustment Factor ("ZWWAF") multiplied by LF, minus the metered load ("Load") multiplied by the LF. The calculation is represented by:

$$(WPL * ZWWAF * LF) - (Load * LF)$$

Compliance is checked on an individual customer basis for Guaranteed Load Drop. Current load for a statistical sample of end-use customers may be used for compliance for residential non-interval metered registrations in accordance with the PJM Manuals and subject to PJM approval. Guaranteed Load Drop compliance will be based on:

- (i) the lesser of (a) comparison load used to best represent what the load would have been if PJM did not declare a Load Management Event or the CSP did not initiate a test as outlined in the PJM Manuals, minus the Load and then multiplied by the LF, or (b) For a summer event, the PLC minus the Load multiplied by the LF. A summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the PLC. For a non-summer event, the WPL multiplied the ZWWAF multiplied by LF, minus the Load multiplied by the LF. A non-summer load reduction will only be recognized for capacity compliance if the Load multiplied by the LF is less than the WPL multiplied by the ZWWAF multiplied by LF.
- (ii) Curtailment Service Providers must submit actual loads and comparison loads for all hours during the day of the Load Management Event or the Load Management performance test, and for all hours during any other days as required by the Office

of the Interconnection to calculate the load reduction. Comparison loads must be developed from the guidelines in the PJM Manuals, and note which method was employed.

- (iii) Methodologies for establishing comparison load for Guaranteed Load Drop end-use customers are described in greater detail in Manual M-19, PJM Manual for Load Forecasting and Analysis, at Attachment A: Load Drop Estimate Guidelines.

Load reduction compliance is determined on an hourly basis for a Demand Resource Registration linked to an Annual Demand Resource with a Capacity Performance commitment, for each FSL and GLD customer dispatched by the Office of the Interconnection for at least 30 minutes of the clock hour (i.e., “partial dispatch compliance hour”). Curtailment Service Provider may submit 1 minute load data for use in capacity compliance calculations for partial dispatch compliance hours subject to PJM approval and in accordance with the PJM Manuals where: (a) metering meets all Tariff and Manual requirements, (b) 1 minute load data shall be submitted to PJM for all locations on the registration, and (c) 1 minute load data measures energy consumption over the minute. The registered capacity commitment for a Demand Resource Registration with a Base or Capacity Performance commitment is not prorated based on the number of minutes dispatched during the clock hours. The actual hourly load reduction for the hour ending that includes a Performance Assessment Interval(s) is flat-profiled over the set of dispatch intervals in the hour in accordance with the PJM Manuals.

A Demand Resource Registration may not reduce their load below zero (i.e., export energy into the system). No compliance credit will be given for an incremental load drop below zero.

For a Performance Assessment Interval, compliance will be totaled over all dispatched registrations for FSL and GLD customers linked to a Provider’s Annual Demand Resource with a Capacity Performance commitment to determine the Actual Performance for such Demand Resource in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals. The Expected Performance for such Demand Resource shall be equal to the Provider’s committed capacity on the Demand Resource, adjusted to account for any linked registrations that were not dispatched by PJM. A Provider’s Demand Resources’ initial Performance Shortfalls shall be netted for all the seller’s Demand Resources in the Emergency Action Area to determine a net Emergency Action Area Performance Shortfall which is then allocated to the Capacity Market Seller’s Demand Resources in accordance with Tariff, Attachment DD, section 10A, and PJM Manuals.

- L. Energy Efficiency Resources – all provisions in RAA, Schedule 6, section L and Tariff, Attachment DD-1, section L shall be effective only through the 2025/2026 Delivery Year. Thereafter, no Energy Efficiency Resources shall qualify to be offered into the RPM Auctions beginning with the 2026/2027 Delivery Year.

1. An Energy Efficiency Resource is a project, including installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards, designed to achieve a continuous (during peak summer and winter periods as described herein) reduction in electric energy consumption at the end-use customer's retail site that is not reflected in the peak load forecast prepared for the Delivery Year for which the Energy Efficiency Resource is proposed, and that is fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.
2. An Energy Efficiency Resource may be offered as a Capacity Resource in the Base Residual or Incremental Auctions for any Delivery Year beginning on or after June 1, 2011. No later than 30 days prior to the auction in which the resource is to be offered, the Capacity Market Seller shall submit to the Office of the Interconnection a notice of intent to offer the resource into such auction and a measurement and verification plan. The notice of intent shall include all pertinent project design data, including but not limited to the peak-load contribution of affected customers, a full description of the equipment, device, system or process intended to achieve the load reduction, the load reduction pattern, the project location, the project development timeline, and any other relevant data. Such notice also shall state the seller's proposed Nominated Energy Efficiency Value.
 - For the 2018/2019 Delivery Year and subsequent Delivery Years and for any Annual Energy Efficiency Resource committed as a Capacity Performance Resource, the seller's proposed Nominated Energy Efficiency Value for any Annual Energy Efficiency Resources, shall be the expected average load reduction, for all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 15:00 EPT and the hour ending 18:00 EPT. In addition, the expected average load reduction for all days from January 1 through February 28, inclusive, of such Delivery Year that is not a weekend or federal holiday, between the hour ending 8:00 EPT and the hour ending 9:00 EPT and between the hour ending 19:00 EPT and the hour ending 20:00 EPT shall not be less than the Nominated Energy Efficiency Value; and
 - For the 2020/2021 Delivery Year and subsequent Delivery Years, the seller's proposed Nominated Energy Efficiency Value for any Summer-Period Energy Efficiency Resource shall be the expected average load reduction between the hour ending 15:00 EPT and the hour ending 18:00 EPT during all days from June 1 through August 31, inclusive, of such Delivery Year that is not a weekend or federal holiday.

The measurement and verification plan shall describe the methods and procedures, consistent with the PJM Manuals, for determining the amount of the load reduction and confirming that such reduction is achieved. The Office

of the Interconnection shall determine, upon review of such notice, the Nominated Energy Efficiency Value that may be offered in the Reliability Pricing Model Auction.

3. An Energy Efficiency Resource may be offered with a price offer or as Self-Supply. If an Energy Efficiency Resource clears the auction, it shall receive the applicable Capacity Resource Clearing Price, subject to section 5 below. A Capacity Market Seller offering an Energy Efficiency Resource must comply with all applicable credit requirements as set forth in Tariff, Attachment Q. The Unforced Capacity value of an Energy Efficiency Resource offered into an RPM Auction or committed in a FRR Capacity Plan shall be the Nominated Energy Efficiency Value times the Forecast Pool Requirement.
4. An Energy Efficiency Resource that clears an auction for a Delivery Year may be offered in auctions for up to three additional consecutive Delivery Years, but shall not be assured of clearing in any such auction; provided, however, an Energy Efficiency Resource may not be offered for any Delivery Year in which any part of the peak season is beyond the expected life of the equipment, device, system, or process providing the expected load reduction; and provided further that a Capacity Market Seller that offers and clears an Energy Efficiency Resource in a BRA may elect a New Entry Price Adjustment on the same terms as set forth in Tariff, Attachment DD, section 5.14(c).
5. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than 30 days prior to each Auction an updated project status and measurement and verification plan subject to the criteria set forth in the PJM Manuals.
6. For every Energy Efficiency Resource clearing an RPM Auction for a Delivery Year, the Capacity Market Seller shall submit to the Office of the Interconnection, by no later than the start of such Delivery Year, an updated project status and detailed measurement and verification data meeting the standards for precision and accuracy set forth in the PJM Manuals. The final value of the Energy Efficiency Resource during such Delivery Year shall be as determined by the Office of the Interconnection based on the submitted data.
7. The Office of the Interconnection may audit, at the Capacity Market Seller's expense, any Energy Efficiency Resource committed to the PJM Region. The audit may be conducted any time including the Performance Hours of the Delivery Year.
8. For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, if a Relevant Electric Retail Regulatory Authority receives FERC authorization to qualify or prohibit Energy Efficiency Resource participation in a specific area(s) of the PJM Region, the following process applies:

(a) The Office of the Interconnection will publicly post a reference to the FERC authorization of a Relevant Electric Retail Regulatory Authority order, ordinance or resolution that qualifies or prohibits Energy Efficiency Resource participation, the applicable electric distribution company(ies), and the applicable auction(s) and/or Delivery Year(s).

(b) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all resources that are located in the jurisdiction of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation within the Zone or LDA, as required, and those outside of the area but within the Zone or LDA, as required.

(c) A Capacity Market Seller that intends to offer or certify Energy Efficiency Resources must identify and itemize all Energy Efficiency Resources to be offered as part of its Energy Efficiency measurement and verification plan and certified post-installation measurement and verification report. The Office of Interconnection will provide a list to the relevant electric distribution company for the specific area(s) to review for compliance with the Relevant Electric Retail Regulatory Authority of Capacity Market Sellers that are:

- (i) offering Energy Efficiency Resources in an RPM Auction within two (2) Business Days after the deadline for submitting an energy efficiency measurement and verification plan for such RPM Auction; and
- (ii) certifying Energy Efficiency Resources with a Delivery Year post-installation measurement and verification report, within two (2) Business Days of receipt of such Delivery Year post-installation measurement and verification report. The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource.

(d) The relevant electric distribution company for the specific area(s) shall review for compliance with rules from a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation and provide a response to the Office of the Interconnection within five (5) Business Days after receiving the list of Capacity Market Sellers offering Energy Efficiency Resources. The Office of the Interconnection will not allow a Capacity Market Seller to offer or certify Energy Efficiency Resources if an electric distribution company denies such Capacity Market Seller to deliver

Energy Efficiency Resources in compliance with rules of a Relevant Electric Retail Regulatory Authority authorized by FERC to qualify or prohibit Energy Efficiency Resource participation.

- (9) For RPM Auctions for the 2021/2022 Delivery Year and subsequent Delivery Years, a Capacity Market Seller of Energy Efficiency Resources that cannot satisfy its RPM obligations in any Delivery Year due to the prohibition of participation by a Relevant Electric Retail Regulatory Authority authorized by FERC to prohibit participation of such resources may be relieved of its Capacity Resource Deficiency Charge by notifying the Office of the Interconnection by no later than seven (7) calendar days prior to the posting of the planning parameters for the Third Incremental Auction of that Delivery Year. After providing such notice, the affected Capacity Market Seller may elect to be relieved of its RPM commitment, and shall not be required to obtain replacement capacity for the resource, and no charges shall be assessed by the Office of the Interconnection for the Capacity Market Seller's deficiency in satisfying its RPM obligation for the resource for such Delivery Year. In such case, however, the Capacity Market Seller shall not be entitled to, nor be paid, any RPM revenues for such resource for that Delivery Year. The Office of the Interconnection will apply corresponding adjustments to the quantity of Buy Bids or Sell Offers in the Incremental Auctions for such Delivery Years in accordance with Tariff, Attachment DD, sections 5.12(b)(ii) and 5.12(b)(iii).

Attachment C

Affidavit of Andrew Gledhill
on Behalf of PJM Interconnection, L.L.C.

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

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PJM Interconnection, L.L.C.) Docket No. ER24-____-000
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**AFFIDAVIT OF ANDREW GLEDHILL
ON BEHALF OF PJM INTERCONNECTION, L.L.C.**

1. My name is Andrew Gledhill. My business address is 2750 Monroe Blvd., Audubon, Pennsylvania, 19403. I am Manager of the Resource Adequacy Planning department in the System Planning division of PJM Interconnection, L.L.C. (“PJM”). I am submitting this affidavit on behalf of PJM to explain: (1) how PJM prepares the long-term load forecast report (“PJM Load Forecast”), which includes the peak load forecast used in Reliability Pricing Model (“RPM”) auctions; (2) how energy efficiency impacts have been and are currently reflected in the peak load forecast; and (3) the addback and why the addback must also be removed if energy efficiency providers are no longer participants in the RPM.

Qualifications

2. I joined PJM in 2011. As Manager of the Resource Adequacy Planning department, I am responsible for overseeing long-term resource adequacy studies and production of the PJM Load Forecast. Prior to this role, my primary responsibility was the development and production of the PJM Load Forecast.
3. I hold a Bachelor of Science degree in Mathematics from the Pennsylvania State University and a Masters degree in Economics from the North Carolina State University.

Overview of the Load Forecast

4. The PJM Load Forecast is an independent work product of PJM. It is a report consisting of a range of hourly and expected peaks over the next fifteen years under a range of historical weather conditions that is produced on an annual basis. The report includes long-term forecasts of peak loads, net energy, load management,

and other such information for each PJM zone, region, locational deliverability area, and the total PJM Region.¹

5. The purpose of the PJM Load Forecast is to provide an accurate signal of expected load conditions, taking into consideration such factors as economic growth, distributed generation, electric vehicles, and equipment/appliance usage trends. The PJM Load Forecast ultimately supports PJM planning and market functions, and includes the peak load forecast used to determine the amount of capacity that needs to be procured in the RPM to meet PJM’s Reliability Requirements. The peak load forecast reflects, among other things, the impact of energy efficiency projects on load.
6. PJM uses rigorous statistical techniques and procures data from reliable sources to complete its load forecast studies. The PJM Load Forecast uses estimating practices and modeling methods that are widely employed within the utility industry. The PJM Load Forecast is in large part based on publicly available data from Energy Information Administration (“EIA”), which is the statistical and analytical agency within the U.S. Department of Energy that “collects, analyzes, and disseminates *independent and impartial* energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.”²
7. More specifically, PJM relies on Form EIA-861M for historic energy use data and the EIA’s Annual Energy Outlook for forward-looking energy use data. In addition, PJM supplements the EIA data, as needed. For example, in recent years, PJM has contracted with vendors to provide data on behind-the-meter solar and electric vehicle charging trends.
8. Methodological enhancements to the PJM Load Forecast are made frequently to acknowledge ongoing patterns and best align the forecast with actual load trends or anticipated factors. These enhancements include, for example, relying on higher-frequency EIA data by, for example, transitioning to relying on Form EIA-861M data instead of Form EIA-861 data. Improving the PJM Load Forecast is an iterative process aimed at making the forecast as accurate as possible.
9. PJM is not unique in taking advantage of statistical modeling to forecast long-term electric demand. Many of PJM’s techniques are broadly used in electric demand forecasting and independent system operators and regional transmission organizations rely on estimating practices and modeling methods similar to PJM’s.

¹ See, e.g., PJM Resource Adequacy Planning Department, *PJM Load Forecast Report*, PJM Interconnection, L.L.C., 1 (Jan. 2024), <https://www.pjm.com/-/media/library/reports-notice/load-forecast/2024-load-report.ashx> (“PJM Load Forecast Report”).

² *Mission and Overview*, U.S. Energy Information Administration, https://www.eia.gov/about/mission_overview.php (last visited Sept. 4, 2024) (emphasis added).

10. PJM also regularly seeks and incorporates stakeholder feedback on the load forecast. Methodology and results are discussed and reviewed at various stages of the PJM stakeholder process, primarily through the Load Analysis Subcommittee and Planning Committee. To the extent PJM has contracted with vendors to supplement EIA data, such as data on behind-the-meter solar and electric vehicle charging trends, PJM circulates vendor assumptions to stakeholders, including state agencies, and solicits their feedback, which PJM then passes along to the vendors. In this way, PJM facilitates an ongoing dialogue between the vendors providing the data and PJM's stakeholders.
11. PJM also engages with outside consultants for the purposes of promoting transparency and identifying potential enhancements of the load forecast process. For example, in 2022, PJM commissioned a publicly available report on the load forecast process from Itron, Inc. ("Itron Report") to assess then-current forecast models and recommend enhancements.³ The Itron Report included issues identified by market participants regarding the process for capturing the impacts of energy efficiency programs.⁴ Following publication of the report, Itron met with the Load Analysis Subcommittee to provide answers to questions raised by stakeholders.

Developing the PJM Load Forecast

12. The PJM Load Forecast is produced using a series of statistical models.⁵ First, to develop the PJM Load Forecast, PJM starts with models for the residential, commercial, and industrial sectors. These three sectors are defined by EIA and reflected in EIA's energy usage data.⁶ Each sector model has its own set of models and inputs based on historic and forecast data from EIA (i.e., Form EIA-861M (historic energy data) and the EIA Annual Energy Outlook (future/independent drivers)).
13. Second, PJM refines and calibrates the data to make EIA's regional data more specific to the PJM footprint. Using the sector models, PJM incorporates independent assumptions on economic trends and end-use adoption and efficiency into the PJM Load Forecast. Each sector model produces a set of three end-use indices: Heat, Cool, and Other. End-use indices are zonal-calibrated measures that serve as the basis for understanding historical and forecast trends in weather-

³ See Eric Fox, et al., *2022 PJM Model Review*, Itron, Inc. (Sept. 6, 2022), <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/pjm-model-review-final-report-from-itron.ashx> ("Itron Report").

⁴ See *id.* at 46-48.

⁵ Details on the production of the PJM Load Forecast can be found in the Load Forecast Supplement. See PJM Resource Adequacy Planning Department, *2024 Load Forecast Supplement*, PJM Interconnection, L.L.C. (Jan. 2024), <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/load-forecast-supplement.ashx>.

⁶ *Glossary*, U.S. Energy Information Administration, <https://www.eia.gov/tools/glossary/> (last visited Sept. 4, 2024).

sensitive and non-weather-sensitive electric use. The end-use indices are the variables used in the next step of developing the PJM Load Forecast.

14. Third, PJM conducts regression analyses using a series of 24 hourly regression models for each PJM zone. Each regression model has the same specifications, with load modeled against certain input variables, including weather variables, calendar effects, and the end-use indices (Heat, Cool, and Other) from the sector model process.
15. Fourth, PJM produces forecasts for each PJM transmission zone by solving the hourly zonal equations, moving through the year on a daily and hourly basis, applying adjustments for historical weather patterns (including conditions for distributed solar generation), making load forecast adjustments (e.g., data centers and peak shaving), and making adjustments for behind-the-meter battery storage and electric vehicles. To enhance the simulation process, each yearly weather pattern is shifted by each day of the week moving forward six days and backwards six days, providing 13 different weather scenarios for each historical year. For instance, in the 2024 PJM Load Forecast, there are 377 forecast scenarios for every hour related to weather variation (29 historical years times 13 scenarios).⁷ For purposes of supporting PJM planning and market functions, these results may be distilled to an expected median forecast (50th percentile) or an extreme value forecast (90th percentile) for a month, year, or season. PJM relies on the full peak load forecast—all 8,760 hours—and the full range of scenarios produced through weather simulation to determine the amount of capacity that must be procured through RPM Auctions to maintain resource adequacy and system reliability.

Energy Efficiency Modeling in the PJM Load Forecast

16. Before certain modeling enhancements were made in 2015, the PJM Load Forecast was based on a model that relied on the correlation of load with economic factors as the primary driver of movements in the forecast. The model could only capture energy efficiency implicitly, i.e., lower observed loads implied energy efficiency gains.
17. One feature of this model was a four-year lag. Because energy efficiency was only captured in the observed loads, and the Base Residual Auction was held three years prior to the Delivery Year, there was a four-year lag between when energy efficiency projects were installed and when they would appear in the load history of the peak load forecast, which was then used to determine the amount of capacity that would need to be procured through the Base Residual Auction for a given Delivery Year.
18. In 2015, PJM, with stakeholder consultation, developed an end-use intensity modeling methodology that directly captured the impact of energy efficiency projects in the PJM Load Forecast. PJM's end-use intensity modeling methodology

⁷ See PJM Load Forecast Report at 1.

relied on end-use intensity values derived from the EIA Annual Energy Outlook. The end-use intensity modeling methodology is reflected in the residential, commercial, and industrial sector models.

19. Beginning with the 2016 PJM Load Forecast through the present, PJM has used end-use intensity modeling, which more accurately captures the impact of energy efficiency measures on forecasted demand. Reliance on end-use intensities in the PJM Load Forecast eliminated the four-year lag between installation of an energy efficiency project and the reflection of that project's impact on load in the PJM Load Forecast.
20. End-use intensity is the relative use over time of a technology, and includes two key components: (1) penetration or saturation, which represent the share of homes or commercial floorspace that own the end-use technology, and (2) efficiency. For example, all else held equal, the end-use intensity of central air conditioning will increase if more people own central air conditioners (i.e., there is an increase in saturation) but decrease if central air conditioners become more efficient. In other words, the more energy efficiency projects reduce the load forecast, the lower the end-use intensity.
21. End-use intensity values are variables in the statistical models that underlie the PJM Load Forecast. These variables reflect growing efficiency, which is reflected as decreasing or slower growth in end-use intensities in the PJM Load Forecast's model estimation and the final forecast.⁸
22. For PJM's residential and commercial sector models, end-use intensities are direct inputs into statistically adjusted end-use models, which capture economic growth and structural changes reflected in end-use saturation and efficiency trends and building shell improvements. Statistically adjusted end-use models generate strong estimates of cooling, heating, and base-use energy requirements.
23. The industrial sector is more diverse than the residential and commercial sectors. For example, the food, transportation, and metal industries each use energy differently, have different energy intensities, and use different types of energy. Like PJM's residential and commercial sector models, PJM's industrial sector model relies on EIA data and uses an end-use intensity modeling methodology. For PJM's industrial sector model, PJM relies on EIA industrial sector energy forecasts to more accurately account for differences across regions and zones.⁹ In the industrial sector, EIA generates energy-per-dollar output projections by industrial sector. Using a combination of state-level output estimates and regional sector

⁸ The Itron Report further explains the interaction of intensity variables and forecast modeling of efficiency impacts. *See* Itron Report at 48-49.

⁹ *See* Itron Report at 15.

employment data, PJM constructs annual industrial indices that reflect Zonal industrial sector real output, productivity, and efficiency improvements.¹⁰

EIA Data and Analytics Is the Foundation for PJM’s Energy Efficiency Modeling Methodology

24. As previously noted, end-use intensities are derived from the EIA Annual Energy Outlook. The EIA Annual Energy Outlook is a report based on EIA’s National Energy Modeling System (“NEMS”). Beginning with EIA’s 1994 Annual Energy Outlook, EIA has relied on NEMS to develop the report.¹¹ “NEMS is an energy-economy modeling system of U.S. energy markets” and is developed and maintained by analysts in EIA’s Office of Energy Analysis, which performs “policy analyses requested by decision makers in the White House; the U.S. Congress; [and] . . . the U.S. Department of Energy” and other agencies.¹² The EIA, in an effort to increase transparency, has recently released the NEMS source code and input data on GitHub.¹³
25. The PJM Load Forecast is based on pre-calibrated EIA data that assumes that, at a minimum, efficiency standards will be met,¹⁴ and the calibration of these trends in statistical models further reinforces this point.¹⁵
26. EIA captures energy efficiency impacts on load in several ways. For example, as the Itron Report explains, “EIA has made an effort to directly account for state and utility efficiency programs by mapping regional [energy efficiency] program expenditures to end-uses and ‘rebating’ (lowering the cost) of the high-efficient technology options. As a result of the lower cost, more of the high-efficient technology option is adopted.”¹⁶ In addition, “the underlying information on new technologies including number of units sold and associated efficiency information are updated on an on-going basis; this information is derived from annual appliance

¹⁰ Itron represents that it has “developed similar inputs for industrial modeling and believe that the PJM current industrial model process is theoretically strong.” Itron Report at 15.

¹¹ *NEMS – National Energy Modeling System: An Overview*, U.S. Energy Information Administration (May 2023), <https://www.eia.gov/analysis/pdfpages/0581index.php>.

¹² *Id.*

¹³ Joseph DeCarolis, *EIA Releases NEMS Open Source*, U.S. Energy Information Administration (May 14, 2024), <https://groups.google.com/g/openmod-initiative/c/qG8JyG9KheM?pli=1>; *EIAgov*, U.S. Energy Information Administration, <https://github.com/EIAgov> (last visited Sept. 4, 2024).

¹⁴ For instance, the EIA Assumptions to the Annual Energy Outlook 2023 states: “In any given year, several equipment options of varying efficiency are available: minimum standard, some intermediate or ENERGY STAR® level, and highest efficiency.” *Assumptions to the Annual Energy Outlook 2023: Residential Demand Module*, U.S. Energy Information Administration, 6 (Mar. 2023) https://www.eia.gov/outlooks/aeo/assumptions/pdf/RDM_Assumptions.pdf.

¹⁵ See *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Answer of PJM Interconnection, L.L.C., Docket No. EL24-118-000, at Exhibit A, Affidavit of Andrew Gledhill ¶ 6 (July 10, 2024) (discussing residential, commercial, and industrial sector models); *id.* ¶ 7 (discussing hourly regression models).

¹⁶ Itron Report at 49.

shipments data. The impact of programs that encourage adoption of more efficient technology such as the Energy Star program and utility incentive programs are partly reflected in the shipments data that in turn are used in calibrating the [EIA Annual Energy Outlook] end-use models.”¹⁷

27. Furthermore, EIA’s NEMS is currently undergoing a major update this year that will be reflected in the forthcoming 2025 Annual Energy Outlook. The EIA NEMS updates will improve the accuracy of energy efficiency modeling in all three of the end-use sectors.¹⁸ For example, the updates will reflect Inflation Reduction Act refinements and additions to energy efficiency standards, requirements, and the impacts of federal programs such as energy efficiency tax credits, energy efficiency rebates, and the adoption of building energy codes by the states.¹⁹

Forecasted Loads in PJM Reflect the Impacts of Energy Efficiency Measures

28. The PJM Open Access Transmission Tariff (“Tariff”) defines Energy Efficiency Resources as:

a project, including installation of more efficient devices or equipment or implementation of more efficient processes or systems, exceeding then-current building codes, appliance standards, or other relevant standards, designed to achieve a continuous (during peak summer and winter periods as described herein) reduction in electric energy consumption at the end-use customer’s retail site that *is not reflected in the peak load forecast* prepared for the Delivery Year for which the Energy Efficiency Resource is proposed, and that is fully implemented at all times during such Delivery Year, without any requirement of notice, dispatch, or operator intervention.²⁰

29. Energy Efficiency Resources, by definition, only include resources not reflected in the peak load forecast. As I have previously stated, the peak load forecast began reflecting the impact of energy efficiency projects on load in 2016. In addition, EIA data assumes that, at a minimum, efficiency standards will be met.²¹
30. The current end-use intensity methodology does an effective job of accurately estimating energy efficiency impacts.

¹⁷ Itron Report at 49.

¹⁸ See Mala Kline, et al., *Annual Energy Outlook 2025 Modeling Updates*, U.S. Energy Information Administration (Apr. 4, 2024), https://www.eia.gov/outlooks/aeo/workinggroup/modeling/AEO2025_Modeling_Update_Presentation.pdf.

¹⁹ *Id.* at 20.

²⁰ Tariff, Attachment DD-1, section L.1; Reliability Assurance Agreement, Schedule 6, section L.1 (emphasis added).

²¹ See *supra* note 14.

31. Statistical analysis strongly supports the inference that the energy efficiency capability embedded in the peak load forecast exceeds the Energy Efficiency Resources that clear or are offered in the RPM.
32. Previously, in Docket No. EL24-118-000, I submitted a supplemental affidavit on behalf of PJM in response to the suggestion that PJM is systematically failing to account for between 3,000 MW and 6,000 MW of energy efficiency reductions to load occurring within its footprint.²² But an error of that magnitude would have been easily detected and could only happen if PJM's processes or data sources were seriously compromised. The possibility that the Energy Efficiency Resources offering into the RPM Auctions could exceed the energy efficiency capability embedded in the forecast is remote.²³
33. There is no indication that PJM's processes or data sources have been compromised in this manner or that such an error is embedded in the PJM Load Forecast. In fact, in a recent, publicly available document providing written responses to stakeholder questions about energy efficiency, PJM compared the weather normal peak load in against the forecasted peak load.²⁴ In 2023, the weather normal peak load in 2023/2024 Delivery Year *exceeded* the forecasted peak load.²⁵ All else held equal, if the PJM Load Forecast had failed to account for significant energy efficiency reductions to load, the weather normal peak load in 2023/2024 Delivery Year would have been significantly *lower* than the forecasted peak load for that year. But, as the data reflects, the forecasted peak load for 2023/2024 Delivery Year was *higher* than the weather normal peak load in 2023/2024 Delivery Year.
34. Further, if PJM's models were not capturing significant impacts of energy efficiency capability, there would be significant reductions when comparing longer term forecasts and shorter term forecasts. More recent, shorter term forecasts are more accurate, because they are closer in time. The most recent load forecasts for 2024/2025 Delivery Year used for the Third Incremental RPM Auction were actually higher than the older forecast for 2024/2025 Delivery Year used for the Base Residual Auction. For 2024/2025 Delivery Year, the 2023 Load Forecast, including energy efficiency capability, reflected 149,737 MW. The currently anticipated summer peak for 2024/2025 Delivery Year at the time PJM drafted the Q&A responses (in May 2024) was 151,247 MW.²⁶ All else held equal, if the PJM Load Forecast had failed to account for significant energy efficiency reductions to

²² *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Response of PJM Interconnection, L.L.C., Docket No. EL24-118-000, at Exhibit A, Supplemental Affidavit of Andrew Gledhill (July 29, 2024).

²³ *Id.* ¶ 8.

²⁴ *Questions Received/PJM Answers*, PJM Interconnection, L.L.C., 3 (May 1, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240501/20240501-item-07a---energy-efficiency-education---questions-and-answers.ashx>.

²⁵ *Id.*

²⁶ *Id.*

load, the 2023 Peak Load Forecast would have been significantly higher than the anticipated 151,247 MW load, not lower.

35. While PJM's energy efficiency modeling is not so granular as to track individual programs, PJM's methodology reasonably captures the impacts of energy efficiency programs. The EIA data used by PJM incorporates information about many of these programs. In addition, the statistically adjusted end-use models used in PJM's Residential and Commercial Sector models refine the broader EIA measures to more localized trends. Reliance on the end-use intensity methodology has directly contributed to the PJM Load Forecast reflecting lower loads than would have otherwise been observed.

The Addback

36. The definition of Energy Efficiency Resources specifically excludes reductions in electric energy consumption already reflected in the peak load forecast, which is an input to the RPM Auctions.
37. Beginning with the 2016 PJM Load Forecast, the peak load forecast used in the RPM has included forecasted reductions to load resulting from energy efficiency measures. Efficiency gains are reflected as demand-side reductions. But energy efficiency providers have also been permitted to participate as a supply-side resource.
38. All demand-side resources, including Energy Efficiency Resources, have the potential to be counted either as reductions to load *or* as supply-side resources. But an energy efficiency project cannot be counted as both a demand-side resource and as a supply side resource in the same Delivery Year, i.e., "double counting."
39. PJM implemented the addback to avoid double-counting energy efficiency projects as both reductions to load on the demand side and as supply-side resources. Through the addback, the MW by which energy efficiency capability had reduced the peak load forecast was added back to the total MW of capacity that needed to be procured through the RPM. The addback allowed energy efficiency providers to continue to participate in the RPM Auctions, even though the impacts of their energy efficiency projects were already recognized in the peak load forecast.
40. The addback ensured that reliability would not be negatively affected by counting the same energy efficiency project as both reducing demand and as supplying capacity in the same Delivery Year.
41. Allowing the same underlying project to both reduce demand and offer as supply, absent some form of addback, can create a potential reliability issue. This can be seen by considering recent auction results. The 2022 PJM Load Forecast issued January 2022 covered 2022 to 2037. That forecast was used as the basis for the 2024 RPM Base Residual Auction and planning parameters, projected a PJM

summer peak load of 150,640 MW.²⁷ The cleared amount of energy efficiency in the 2024/2025 Base Residual Auction was 7,667 MW.²⁸ Absent an addback, the signal would have been that the market only needs to procure resources to serve 142,973 MW (150,640 MW original forecast less 7,667 MW cleared energy efficiency), effectively shifting the Variable Resource Requirement Curve by 7,667 MW to the left on the x-axis. The most recent peak load forecast, which covered 2024 to 2039 and issued in connection with the Third Incremental Auction prepared for 2024/2025 Delivery Year, was 151,631 MW.²⁹ This indicates that not applying the addback would have resulted in a reliability deficit of 8,658 MW (151,631 MW forecast less 142,973 MW implied reliability requirement if the addback was not used). In short, the addback was necessary to avoid double-counting and creating a reliability issue.

42. If energy efficiency providers are no longer permitted to participate in the RPM, these providers' energy efficiency projects will only be counted as a reduction to demand. These energy efficiency projects will no longer be double-counted as an offer to supply capacity as well. Therefore, the addback would no longer be needed to avoid double-counting.
43. This concludes my affidavit.

²⁷ *2024-2025 RPM Base Residual Auction Planning Parameters*, PJM Interconnection, L.L.C. (May 8, 2024), <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2024-2025/2024-2025-rpm-bra-planning-parameters.ashx>. The 2024-2025 RPM Base Residual Auction Planning Parameters used the 2022 Load Forecast covering 2022 to 2037. See PJM Resource Adequacy Planning Department, *PJM Load Forecast Report*, PJM Interconnection, L.L.C. (Jan. 2022), <https://www.pjm.com/-/media/library/reports-notice/load-forecast/2022-load-report.ashx>.

²⁸ *2024/2025 RPM Base Residual Auction Results*, PJM Interconnection, L.L.C. (June 18, 2024), <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2024-2025/2024-2025-base-residual-auction-report.ashx>.

²⁹ *2024-2025 RPM Third Incremental Auction Planning Parameters*, PJM Interconnection, L.L.C. (June 6, 2024), <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2024-2025/2024-2025-3ia-planning-parameters.ashx>. The 2024-2025 Third Incremental Auction Planning Parameters used the 2024 Load Forecast covering 2024 to 2039. See *PJM Load Forecast Report*.

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

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PJM Interconnection, L.L.C.)	Docket No. ER24-___-000
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VERIFICATION OF ANDREW GLEDHILL

I, Andrew Gledhill, pursuant to 28 U.S.C. § 1746, state, under penalty of perjury, that I am the Andrew Gledhill referred to in the foregoing document entitled “Affidavit of Andrew Gledhill on Behalf of PJM Interconnection, L.L.C.,” that I have read the same and am familiar with the contents thereof, and that the facts set forth therein are true and correct to the best of my knowledge, information, and belief.

/s/ Andrew Gledhill
Andrew Gledhill

Executed on: September 6, 2024