

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

PJM Interconnection L.L.C.)
) Docket No. ER24-2995-000
)

**PROTEST OF THE ENVIRONMENTAL LAW & POLICY CENTER, THE
SUSTAINABLE FERC PROJECT AND THE NATURAL RESOURCES DEFENSE
COUNCIL**

Pursuant to Rule 211 of the Commission’s Rules of Practice and Procedure,¹ the Environmental Law & Policy Center (ELPC), the Sustainable FERC Project, and the Natural Resources Defense Council (NRDC) (collectively, Public Interest Organizations or PIOs), submit this protest to the proposed tariff revisions and accompanying documents that PJM Interconnection, L.L.C. (PJM) filed with the Commission on September 6, 2024 (Filing).

I. Introduction

Over the past 14 years, energy efficiency has emerged as a key capacity resource in PJM. Since 2010, when PJM first opened its capacity market to energy efficiency resources, the capacity contributions of those resources have grown from less than 100 MW to nearly 8,000 MW.² In 2014, PJM recognized that energy efficiency has had a major effect on load, leading to load forecasts that consistently outpaced actual load growth.³ PJM attempted to correct its

¹ 18 CFR § 385.211 (2024).

² Peter Langbein, “Evaluation of Energy Efficiency Resources,” Presentation to PJM Markets & Reliability Committee (Feb. 22, 2024), *available at* <https://www.pjm.com/-/media/committees-groups/committees/mrc/2024/20240222/20240222-item-03a---1-ee-resource-evaluation-manual-18b-revisions---presentation.ashx>

³ PJM Interconnection, LLC, “Draft 2015 Load Forecast,” (Dec. 4, 2014), *available at* <https://www.pjm.com/-/media/committees-groups/committees/pc/20141204/20141204-item-05-draft-load-forecast-discussion.ashx>. *See also* Ahmad Faruqui et al., “Quantifying the Amount and Economic Impacts of Missing Energy Efficiency in PJM’s Load Forecast,” The Brattle Group (Sept. 2014), *available at* <https://sustainableferc.org/wp-content/uploads/2014/09/Brattle-Study-on-Missing-Energy-Efficiency-in-PJM-Load-Forecast.pdf>

inaccurate load forecast by incorporating data regarding energy efficiency adoption into the load forecast model.⁴

Incorporating energy efficiency into the load forecast created a new problem for PJM. Because energy efficiency reduced the load forecast, it also reduced the reliability requirement—i.e. the amount of capacity that Load Serving Entities (LSEs) must procure through PJM’s capacity market (the Reliability Pricing Model, or RPM). At the same time, Energy Efficiency Resources⁵ could still bid into the RPM as supply. In theory, a single megawatt of energy efficiency could reduce the reliability requirement *and* provide supply into the RPM in order to meet the reliability requirement, essentially doubling its effect on the market.

PJM attempted to address this “double counting” problem with a new rule called the “addback” mechanism. The addback, first implemented in 2015, works as follows: for every megawatt of capacity that an Energy Efficiency Resource sells into the capacity market, PJM adds one megawatt back to the reliability requirement. The upshot of this approach is that PJM pays Energy Efficiency Resources the clearing price, but Energy Efficiency Resources do not directly reduce the reliability requirement or replace any resources that would have otherwise cleared the market.

The addback mechanism has few defenders. In Docket No. EL24-118, a group of Consumer Advocates filed a complaint against PJM asserting that “the addback is unjust, unreasonable, and unduly discriminatory and preferential in violation of the FPA.”⁶ As the Consumer Advocates explained, “[t]he addback directly increases the clearing price and imposes

⁴ PJM Interconnection LLC, *Exploring PJM: Energy Efficiency in Load Forecasting* (June 21, 2016), <https://insidelines.pjm.com/exploring-pjm-energy-efficiency-in-load-forecasting/>.

⁵ Reliability Assurance Agreement Among Load Serving Entities in the PJM Region (RAA), Section I, Definitions.

⁶ *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Docket No. EL24-118, Complaint of the Joint Consumer Advocates at 2 (filed June 20, 2024).

cost on load without providing load the benefit from the resources they are paying for outside of the market.”⁷ The PJM Internal Market Monitor agreed with that assessment, stating in comments that the addback “violates the Federal Power Act and is inconsistent with the tariff definition of EE Resources.”⁸ Energy efficiency providers such as Energy Efficient, LLC likewise asserted that the addback was not just and reasonable.⁹ PIOs agree with those views.¹⁰

Docket No. EL24-118 provided PJM the opportunity to both eliminate the addback and thoughtfully reform its approach to energy efficiency participation in the capacity market. Instead of taking advantage of that opportunity, however, PJM took two contradictory steps. First, in Docket No. EL24-118, PJM defended the addback, asserting that “the addback is illustrative of PJM’s efforts to support the participation of EE Resources in capacity auctions.”¹¹ PJM asked the Commission to reject the Consumer Advocates complaint “without convening a technical conference or an evidentiary hearing.”¹² Now, in this docket, PJM abandons its defense of the addback and its support for energy efficiency participation in capacity auctions and asks the Commission to do away with both.

PJM’s about-face on energy efficiency comes at exactly the wrong time. In PJM’s most recent capacity auction, capacity prices soared to \$269.92 per MW-day.¹³ PJM itself has warned

⁷ *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Docket No. EL24-118, Complaint of the Joint Consumer Advocates at 8-9 (filed June 20, 2024).

⁸ Comments of the Independent Market Monitor for PJM, Docket No. EL24-118-000 (filed July 10, 2024).

⁹ *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Comments of Affirmed Energy LLC in Support of Joint Consumer Advocates’ Complaint, Docket No. EL24-118 (filed July 10, 2024).

¹⁰ See Comments of Natural Resources Defence Council, Docket No. EL24-118 (July 11, 2024), FERC Accession 20240711-5009. See also Comments of the Sierra Club in Support of Complaint Filed by Joint Consumer Advocates, Docket No. EL24-118 (July 10, 2024) FERC Accession 20240710-5170.

¹¹ *Joint Consumer Advocates v. PJM Interconnection, L.L.C.*, Docket No. EL24-118, Answer of PJM at 2 (filed June 20, 2024).

¹² *Id.* At 25.

¹³ See *2025/2026 Base Residual Auction Report*, PJM (July 30, 2024), available at <https://pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2025-2026/2025-2026-base-residual-auction-report.ashx>; Claire Lang-Ree, *PJM’s Capacity Auction: the Real Story* (Aug. 22, 2024), available at <https://www.nrdc.org/bio/claire-lang-ree/pjms-capacity-auction-real-story>.

of capacity shortages in the coming decade.¹⁴ In a time of tightening supply, PJM should be looking for ways to encourage more capacity resources to enter the market and to accurately account for existing resources. With this filing, PJM does precisely the opposite, seeking to close the capacity market to a resource with a track record of success over the past fifteen years.

Excluding energy efficiency resources from the RPM would almost certainly lead to uncounted energy efficiency in PJM's capacity market, and corresponding unjust and unreasonable costs. As we discuss below, PJM's load forecast does *not* capture every type of energy efficiency resource in PJM and in fact excludes important technologies. An important function of supply side energy efficiency is mobilizing merchant energy efficiency providers to document savings PJM does not model in its load forecast and commit to delivering those savings.¹⁵ PJM's filing does not even attempt to quantify these problems.¹⁶ As a result, the Commission has no way to know whether PJM's proposal would leave one megawatt of energy efficiency capacity on the table or one thousand.

Instead of accepting PJM's chainsaw approach to energy efficiency, the Commission should direct PJM to pick up a scalpel. The technical conference (or evidentiary hearing) requested in Docket No. EL24-118 would provide PJM, stakeholders, and the Commission itself with a robust record regarding energy efficiency in PJM. A technical conference would enable

¹⁴ *Energy Transition in PJM: Resource Retirements, Replacements & Risks*, PJM (Feb. 24, 2023), available at <https://www.pjm.com/-/media/library/reports-notice/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx>

¹⁵ See Kathleen Spees et al., *The Benefits of Energy Efficiency Participation in Capacity Markets*, The Brattle Group, at 1 (Apr. 1, 2021), <https://www.aee.net/hubfs/The%20Benefits%20of%20Energy%20Efficiency%20Participation%20in%20Capacity%20Markets1.pdf> (“If merchant EE did not receive supply-side treatment, the EE providers would have little incentive to present the market operator with accurate estimates—and certainly not with financially binding forward commitments—for their anticipated peak load reductions.”).

¹⁶ As discussed in further detail below, in Docket No. EL24-118, PJM has admitted that the load forecast is not 100% accurate and does not capture all Energy Efficiency Resources, but has not otherwise quantified the accuracy of the forecast as it pertains to energy efficiency. See Response of PJM, L.L.C., Docket No. 24-118, at 2-3 (July 29, 2024), accession no. 20240729-5130.

PJM and the Commission to develop a smart, targeted policy for energy efficiency participation in the RPM—one that avoids double counting specific energy efficiency investments while continuing to provide incentives for cost-effective capacity resources.

II. Background

A. Energy Efficiency plays a key role in maintaining just and reasonable rates for capacity in PJM and other RTOs.

As this Commission explained when it first approved PJM’s proposal to allow Energy Efficiency Resources to bid into RPM, treating energy efficiency as a capacity resource “corrects a mismatch between EE-related load reductions and capacity requirement levels.”¹⁷ Investments in Energy Efficiency Resources reduce an end-use customer’s peak demand. Those reductions, in turn, can obviate otherwise-necessary investments in generating capacity. Accordingly, the capacity value that one megawatt of Energy Efficiency Resource provides is indistinguishable from the capacity value that one megawatt of generation provides. PJM’s filing recognizes that reality, stating that energy efficiency “provides value by reducing the need for load serving entities to procure capacity and the attendant costs of maintaining capacity levels.”¹⁸

The Commission has long recognized that energy efficiency is a “critical part of efficient energy markets.”¹⁹ In PJM, the Commission’s support for energy efficiency as a capacity resource goes back to 2007, when the Commission first directed the ISO to enable the participation of energy efficiency in RPM.²⁰ The Commission found that PJM’s tariff did “not treat investment in energy efficiency as a type of capacity resource eligible to participate in the capacity market and, that to the extent possible, energy efficiency solutions should be able to

¹⁷ *PJM Interconnection, L.L.C.*, 126 FERC ¶ 61,275, at P 132 (2009) (Original EE Order).

¹⁸ Filing at 2.

¹⁹ Original EE Order ¶ 130.

²⁰ *PJM Interconnection, L.L.C.*, 119 FERC ¶ 61,318, at P 203 (2007).

compete on an equal footing with demand response, generation, and transmission solutions.”²¹

The Commission noted that ISO-NE had recently proposed rules to incorporate energy efficiency into the capacity market and directed PJM to consider “whether a similar means of incorporating energy efficient applications into the capacity market . . . could be applicable to PJM.”²²

Following that order, PJM proposed tariff changes to incorporate energy efficiency into the RPM, which the Commission approved in 2009.²³ The Commission explained that,

We commend PJM for developing a proposal to incorporate energy efficiency into its capacity markets. We believe that energy efficiency is a critical part of efficient energy markets, and should be treated comparably to other types of resources, by being allowed to participate in base residual auctions and be paid the auction clearing price when they are accepted in the auction.²⁴

Since approving those tariff changes in 2009, the Commission continued to support the inclusion of energy efficiency as a capacity resource in PJM and other ISOs. For example, in a 2017 case, the Commission considered a challenge to its jurisdiction over the participation of energy efficiency resources (EERs), including those located at the retail level, in wholesale markets.²⁵ In affirming that it had “exclusive jurisdiction over the participation of EERs in wholesale markets,” the Commission also made sure to reassert its earlier order “requiring and approving the participation of EERs” in PJM’s capacity market.²⁶ The Commission again explained that “to the extent possible, energy efficiency solutions should be able to compete on an equal footing with demand response, generation, and transmission solutions.”²⁷

²¹ *Id.*

²² *Id.* (citing *ISO New England*, 119 FERC ¶ 61,045 (2007)).

²³ Original EE Order, at ¶ 130.

²⁴ *Id.*

²⁵ *Advanced Energy Economy*, 161 FERC ¶ 61,245 (2017).

²⁶ *Id.* ¶¶ 57, 60 (citing Original EE Order, at ¶ 130).

²⁷ *Id.* ¶ 60.

The Commission has also supported energy efficiency participation in the capacity constructs of other ISOs, including MISO and ISO-NE.²⁸ In ISO-NE, demand resources (which include energy efficiency) accounted for more than 8% of total capacity in the most recent capacity auction. Notably, MISO’s approach to energy efficiency allows load-serving entities (LSEs) to either incorporate them into load forecasts specific to each LSE’s footprint or identify them as supply-side capacity resources.²⁹

In the fifteen years since the Commission’s 2009 order, energy efficiency has grown to be a significant component of the PJM region’s capacity. The EIA reports that utility energy efficiency programs contributed over 5,000 MW in peak demand savings in PJM in 2022, the most recent year for which data is available.³⁰ Similarly, more than 7,600 MW of energy efficiency cleared the PJM capacity market for the 2024/25 delivery year.³¹ That represents two orders of magnitude growth over the past fifteen years, as just 78 MW of energy efficiency cleared the auction for the 2011/2012 delivery year.³²

In fact, PJM chose to begin including energy efficiency in its load forecast in 2015 specifically *because* energy efficiency had been so effective at reducing load.³³ PJM specifically identified “the gains from the use of more efficient lighting, air conditioning/heating, [and] electronics and industrial processes” as a key reason load had been consistently lower than

²⁸ *Midwest Indep. Transmission Sys. Operator, Inc.*, 139 FERC ¶ 61,199, at P 233 (2012); *ISO-New England, Inc.*, 119 FERC ¶ 61,045, PP 151-52 (2007).

²⁹ *Midwest Indep. Transmission Sys. Operator, Inc.*, 142 FERC ¶ 61,149, at PP 25-28 (2013).

³⁰ Energy Information Administration, “Annual Electric Power Industry Report, Form EIA-861 detailed data files,” 2022 Final Data Set, *available at* <https://www.eia.gov/electricity/data/eia861/>

³¹ Peter Langbein, “Evaluation of Energy Efficiency Resources,” Presentation to PJM Markets & Reliability Committee (Feb. 22, 2024), *available at* <https://www.pjm.com/-/media/committees-groups/committees/mrc/2024/20240222/20240222-item-03a---1-ee-resource-evaluation-manual-18b-revisions---presentation.ashx>

³² *Id.*

³³ PJM Interconnection LLC, *Exploring PJM: Energy Efficiency in Load Forecasting* (June 21, 2016), <https://insidelines.pjm.com/exploring-pjm-energy-efficiency-in-load-forecasting/>.

forecast several years in a row.³⁴ A Brattle Group report published shortly before PJM changed its approach to the load forecast found that energy efficiency would lead to an uncounted 2.5% reduction in peak demand in PJM by 2022.³⁵

In sum, the Commission's 2007 directive that "energy efficiency solutions should be able to compete on an equal footing with demand response, generation, and transmission solutions" has yielded results. While most energy efficiency resources deployed in PJM over the past 15 years are no longer eligible to bid into the RPM, many continue to provide load reductions.³⁶ As a result, those investments continue to reduce the amount of generation that Load-Serving Entities (LSEs) must procure through the RPM, resulting in lower capacity costs for customers, and rates that are just and reasonable.

B. The Commission has established that RTO/ISO markets should include any resource that is "technically capable" of providing a service.

The Commission's support for energy efficiency reflects a commitment to open, technology-neutral markets. Over the past fifteen years, the Commission has repeatedly expressed support for the broader principle that energy, capacity, and ancillary services market rules should enable competition between disparate resource types. The Commission has explained that competition induces innovation and results in just and reasonable rates.

Order No. 2222, which removed barriers to the participation of distributed energy resource (DER) aggregations in ISO markets, provides a clear enunciation of that principle.³⁷ In

³⁴ *Id.*

³⁵ Ahmad Faruqui et al., "Quantifying the Amount and Economic Impacts of Missing Energy Efficiency in PJM's Load Forecast," The Brattle Group (Sept. 2014), available at <https://sustainableferc.org/wp-content/uploads/2014/09/Brattle-Study-on-Missing-Energy-Efficiency-in-PJM-Load-Forecast.pdf>

³⁶ See Ian Hoffman, et al., *Energy Savings Lifetimes and Persistence: Practices, Issues, and Data*, Lawrence Berkeley National Lab (May 2015) (finding that average lifetime for energy efficiency investments is 13 years), available at <https://live-lbl-eta-publications.pantheonsite.io/sites/default/files/savings-lifetime-persistence-brief.pdf>

³⁷ *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 172 FERC ¶ 61,247 (2020) (Order No. 2222).

Order No. 2222, the Commission found that existing RTO rules created barriers to the participation of DER aggregations in capacity and energy markets, and that those barriers “reduce competition and fail to ensure just and reasonable rates.”³⁸ The Commission explained:

Where such barriers exist, resources that are technically capable of providing some services on their own or through aggregation are precluded from competing with resources that are already participating in the RTO/ISO markets. These restrictions on competition can reduce the efficiency of the RTO/ISO markets, potentially leading an RTO/ISO to dispatch more expensive resources to meet its system needs. By removing barriers to the participation of distributed energy resource aggregations in the RTO/ISO markets, this final rule will enhance competition and, in turn, help to ensure that the RTO/ISO markets produce just and reasonable rates.³⁹

The Commission also noted several beneficial attributes of DERs that apply equally to energy efficiency, including “their ability to co-locate with load and provide associated benefits” and “their relatively short development lead time [which] allows distributed energy resources to respond rapidly to near-term generation or transmission reliability-related requirements.”⁴⁰

The Commission similarly demonstrated its commitment to ensuring ISO market rules do not prevent the participation of non-traditional resources in Order 841, which addressed energy storage.⁴¹ The Commission explained that when barriers to participation exist, “resources that are technically capable of providing services are precluded from competing with resources that are already participating in the RTO/ISO markets.”⁴² As with Order No. 2222, the Commission noted that removing barriers to market participation “will enhance competition and, in turn, help to ensure that the RTO/ISO markets produce just and reasonable rates.”⁴³

³⁸ *Id.* ¶ 1.

³⁹ *Id.* ¶ 3 (footnotes omitted).

⁴⁰ *Id.* ¶ 4.

⁴¹ *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 162 FERC ¶ 61,127 (2018) (Order No. 841).

⁴² *Id.* ¶ 2.

⁴³ *Id.*

Orders No. 2222 and 841 demonstrate the Commission’s commitment to competition and open markets. They establish a general rule that ISOs should enable resources that are “technically capable of providing services” to participate in ISO markets for those services. The Commission has further explained that “[a] resource is “technically capable” of providing a service if the resource can meet all of the technical, operational, and/or performance requirements that are necessary to reliably provide that service.”⁴⁴ When ISOs exclude technically capable resources from markets, the Commission has explained, they stifle competition, creating a risk that the market will produce rates that are not just and reasonable.

PJM now asks the Commission to end its two-decade embrace of open, technology-neutral markets by singling out energy efficiency for exclusion from the PJM capacity market.

III. Argument

As discussed above, over the past two decades the Commission has established that ISOs should open their markets to any resource that is “technically capable of providing a service.”⁴⁵ In seeking to single out energy efficiency for exclusion from the capacity market, PJM does *not* argue that energy efficiency lacks the technical capability to provide capacity. Instead, PJM relies on the following three arguments:

(1) PJM’s peak load forecast . . . already includes the projected net impacts of energy efficiency actions . . . (2) there is no evidence of any causal link between capacity market payments . . . and the deployment of energy efficiency projects; and (3) consumers that install energy efficiency measures already reap the economic benefit of lower capacity costs through a lower peak load obligation from reductions in energy consumption.⁴⁶

These arguments misstate the facts regarding energy efficiency in PJM while establishing a brand-new causation standard that PJM applies to energy efficiency alone.

⁴⁴ *ISO New England Inc.*, 169 FERC ¶ 61,140, at P 65 (2019).

⁴⁵ Order No. 841, at ¶ 2.

⁴⁶ Filing at 2-3.

As the party filing for a change to its tariff, PJM “bears the burden of proving the adjustment is lawful.”⁴⁷ PJM’s filing falls well short of that burden. The result of PJM’s proposal would be capacity market rules that unduly discriminate against a single resource, and rates that are not just and reasonable.

A. PJM’s proposal excludes energy efficiency resources that the load forecast does not reflect, leading to rates that are not just and reasonable.

The primary justification for PJM’s request to exclude energy efficiency from the capacity market is that, according to PJM, the PJM Load Forecast already reflects the participation of Energy Efficiency Resources. PJM asserts that “[s]ince 2016, PJM’s peak load forecast[] has accounted for the projected deployment of energy efficiency in aggregate within the PJM Region.”⁴⁸ PJM argues that, by including EE in the load forecast, “the PJM Region directly realizes the benefits of energy efficiency projects as they reduce the amount of capacity that PJM must procure.”⁴⁹ PJM concludes that “[i]t 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.”⁵⁰

To support this argument, PJM provides the affidavit of Andrew Gledhill, a Resource Adequacy Planning manager at PJM.⁵¹ Mr. Gledhill provides an overview of the PJM Load Forecast in an attempt to demonstrate how it captures energy efficiency resources. Mr. Gledhill explains that the PJM Load Forecast relies on “end-use intensity modeling,” stating that “the more energy efficiency projects reduce the load forecast, the lower the end-use intensity.”⁵² Mr. Geldhill notes that data from the Energy Information Administration (EIA) provides the

⁴⁷ *Alabama Power Co. v. FERC*, 993 F.2d 1557, 1571 (D.C. Cir. 1993).

⁴⁸ Filing at 4.

⁴⁹ *Id.* at 5.

⁵⁰ *Id.* at 32.

⁵¹ Filing Attachment C (Gledhill Affidavit).

⁵² Gledhill Aff. ¶¶ 19-20.

foundation for the end-use intensity modeling, and explains that “EIA captures energy efficiency impacts on load in several ways.”⁵³ Mr. Gledhill concludes that the “end-use intensity methodology does an effective job of accurately estimating energy efficiency impacts.”⁵⁴

Contrary to PJM’s position and Mr. Gledhill’s affidavit, the PJM Load Forecast—and the EIA data on which it relies—excludes significant categories of energy efficiency measures. Mike Cham, CTO of Encentiv Energy, a company that tracks energy efficiency rebates across the United States, recently identified some of the shortcomings of the load forecast in a letter to PJM.⁵⁵ As Mr. Cham explained, incomplete EIA data means that “PJM load forecasts are missing load reductions for higher efficiency equipment that are sold with midstream/upstream rebates.”⁵⁶ The load forecast also excludes specific technologies like commercial outdoor lighting and chillers, “which are very significant sources of electrical demand.”⁵⁷ The EIA data also excludes or understates certain rebate programs in the PJM footprint, including rebate programs in Virginia, Pennsylvania, Indiana, and Illinois.⁵⁸ The upshot of the inaccuracies of the EIA data, according to Mr. Cham, is to underrepresent the overall amount of energy efficiency.

The Gledhill Affidavit attempts to sweep deficiencies in the PJM Load Forecast under the rug by pointing out that the peak load forecast in recent years has generally been lower than actual results. Mr. Gledhill asserts, for example, that, “[a]ll 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

⁵³ Gledhill Aff. ¶¶ 24-26.

⁵⁴ Gledhill Aff. ¶ 30.

⁵⁵ Mr. Cham’s letter is attached to this Protest as Exhibit A. The contents of the letter are also available at <https://blog.encentivenergy.com/news/pjm-utility-rebates>

⁵⁶ Exhibit A at 5.

⁵⁷ *Id.*

⁵⁸ *Id.* at 4.

peak load for that year.” Gledhill Aff. P 33. In essence, Mr. Gledhill believes that a single instance of load being above forecast is evidence that PJM is overestimating energy efficiency.

A single cherry picked data point should not be mistaken for evidence, and does not meet the standard to demonstrate PJM’s proposed rate is just and reasonable. A more systematic review of load forecast vs. actual load casts doubt on Mr. Gledhill’s conclusion. PJM’s recent review⁵⁹ of loads and forecast for the summer of 2024 establishes multiple facts consistent with PJM underforecasting energy efficiency:

- The NOAA reports that summer of 2024 was the fourth hottest summer⁶⁰ in its 174- year climate record,⁶¹ placing it at the 98th percentile. However, PJM reports, load was only around the 60th percentile of forecasts, and that PJM had forecasted peak load in a 98th percentile to be more than 10%, or 15GW higher than what was observed.⁶² To be sure, NOAA weather summaries do not directly correspond to PJM load percentiles, but 15GW is a huge discrepancy, easily large enough to call any claims of “overestimating” energy efficiency into question.
- When PJM tests its load model with actual weather, the model very consistently forecasts load 1% - 3% higher than actual.⁶³
- Load on every peak day in the summer of 2024 was lower than the model forecast when tested with actual weather conditions.⁶⁴

In response to critiques of the PJM Load Forecast’s treatment of energy efficiency in Docket No. EL24-118, PJM has admitted that the PJM Load Forecast may not reflect all energy

⁵⁹ Mooney, Molly, Review of Preliminary Summer 2024 Loads (Sept. 19, 2024) (2024 Forecast Review), available at <https://www.pjm.com/-/media/committees-groups/subcommittees/las/2024/20240919/20240919-item-03---review-preliminary-summer-2024-loads.ashx>.

⁶⁰ National Oceanic and Atmospheric Administration, *U.S. sweltered through its 4th-hottest summer on record: Intense heat broke multiple records across the nation* (Sept. 10, 2024), available at <https://www.noaa.gov/news/us-sweltered-through-its-4th-hottest-summer-on-record>

⁶¹ NOAA, “2023 was the world’s warmest year on record, by far” (Jan. 2024). Available at <https://www.noaa.gov/news/2023-was-worlds-warmest-year-on-record-by-far>.

⁶² 2024 Forecast Review at 2.

⁶³ *Id.* at 8. Note the counterintuitive sign convention: negative errors mean actual load is lower than forecast load. *See id.* at 9 (explaining error calculation).

⁶⁴ *Id.* at 9.

efficiency investments in the PJM region.⁶⁵ PJM argues that expecting the load forecast to have “100% perfect foresight” or “100% accuracy” is an “unreasonable premise.” *Id.*

PJM’s straw man argument in that docket dances around the reality that PJM has not even attempted to quantify the load forecast’s accuracy as it pertains to energy efficiency. Does the load forecast capture 90% of energy efficiency investments? Does it capture 50%? PJM does not say. Indeed, PJM’s filing in this docket and the Gledhill Affidavit both studiously avoid any language that might imply the proportion of energy efficiency reflected in the PJM Load Forecast. PJM does not claim, for example, that the load forecast reflects “most” energy efficiency resources or a “majority” of energy efficiency. Instead, PJM and Mr. Gledhill hold the line at stating that the load forecast has captured “significant energy efficiency reductions to load.”⁶⁶

PJM cannot meet its evidentiary burden in this 205 proceeding with such broad and unsubstantiated assertions. PIOs do not dispute the premise that the RPM should not “double count” capacity resources by including them as both demand- and supply-side resources. But when PJM claims that double counting has occurred, PJM itself should identify with *some* level of specificity the extent of the double counting. To exclude an entire resource class from the market because an unknown amount of double counting has occurred is to throw the baby out with the bathwater. The result of such a sweeping approach is less competition and rates that are not just and reasonable.

Ultimately, the problem is that PJM simply does not know how to accurately measure EE to the tariff standard of as reductions “not reflected in the peak load forecast.”⁶⁷ PJM presently

⁶⁵ Response of PJM, L.L.C., Docket No. 24-118, at 2-3 (July 29, 2024), accession no. 20240729-5130.

⁶⁶ Filing at 20 (quoting Gledhill Aff. ¶ 33).

⁶⁷ RAA Schedule 6 § L.1.

cannot determine if the RPM double-counts any particular EER, and so PJM resorts to the blunt instruments of the addback and, now, the instant filing.

Nothing PJM offers meaningfully challenges the Commission's conclusion from fifteen years ago: energy efficiency measures that reduce load below the forecast have capacity value. Failure to recognize that value increases capacity prices unnecessarily, resulting in unjust and unreasonable rates. When the region is tight on capacity, small variations in the supply/demand balance can result in very large price swings, making this issue even more critical now. PJM's claims that their load forecasts will capture all energy efficiency defy reason, as it is always possible that events occur after the load forecast is prepared that are not captured in the models.

B. PJM's proposal unduly discriminates against an important capacity resource by selectively applying a strict causation standard to only EE Resources.

PJM's second argument in favor of its request to exclude energy efficiency from the RPM is that "[t]here is no causal link between the growth in actual energy efficiency capability and the revenue received from the PJM capacity market."⁶⁸ PJM asserts, without providing any evidentiary support, that "the proliferation of energy efficiency projects in the PJM Region is entirely unrelated to capacity payments."⁶⁹ PJM argues that "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."⁷⁰

As an initial matter, PJM provides almost no evidence in support of its broad claims regarding the connection between capacity payments and energy efficiency deployment. PJM states that "several utility members that currently offer Energy Efficiency Resources into PJM's capacity market indicated that they will continue to incentivize energy efficiency projects

⁶⁸ Filing at 38.

⁶⁹ *Id.*

⁷⁰ *Id.* at 37.

through state-sponsored retail programs.”⁷¹ To support that statement, PJM provides a citation to a presentation from a single utility, Exelon, which makes no claims about how exclusion of energy efficiency resources from the RPM would affect deployment of those resources.⁷² PJM again falls well short of meeting its burden of proof.

PJM’s assertion that capacity payments have no effect on energy efficiency deployment ignores basic economics. Energy efficiency resources are not uniquely immune to financial incentives, and energy efficiency providers react to price signals just like any other market participant. Surely PJM would recognize, for example, that a capacity price of \$1,000,000 per MW-day would incent additional energy efficiency deployment. Higher prices draw new, untapped resources—including energy efficiency resources—into the marketplace. That is how markets work.⁷³

Moreover, PJM’s position that energy efficiency resources must provide evidence of a “causal link” between capacity payments and energy efficiency deployment contradicts Commission Orders 841 and 2222. As discussed above, those orders established a general rule that energy markets should not exclude resources that are “technically capable of providing a service.” Conversely, the Commission has *never* said that a resource’s eligibility to participate in a market depends on whether market payments will affect the resource’s deployment. Among

⁷¹ Filing at 39.

⁷² 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.”).

⁷³ In Docket No. EL24-113, one energy efficiency provider, CPower, has explained how capacity market payments allow distributors of energy efficiency products to reduce prices for consumers. CPower’s Answer and Motion to Dismiss or Summarily Dispose of Complaint and Request for Confidential Treatment, Docket No. EL24-113-000, at 21-25 (July 22, 2024).

other problems, such a rule would perversely penalize the most cost-effective resources—i.e., those resources that can provide a service for no cost at all by relying on other revenue sources.

Indeed, PJM’s own words in its 2021 Minimum Offer Price Rule (MOPR) filing reflect a very different understanding of the capacity market.⁷⁴ In that filing, PJM explained that “the fundamental purpose of a centralized capacity market [is] to provide, among other things, market efficiencies and an accurate price signal both for investment and retirement decisions so that capacity can be provided at least cost to consumers.”⁷⁵ PJM had previously attempted to negate state subsidies for certain resources by requiring those resources to bid higher prices. In changing course on that policy, PJM recognized that state support for certain resources was a “reality,” and that ignoring that reality would distort the market:

If that higher offer price does not clear the auction, the resource is not committed to provide capacity to the PJM Region, and its capacity is not counted towards meeting reliability requirements in PJM. But if the resource is installed (or remains in service) and effectively provides a reliability service notwithstanding denial of capacity revenues, the auction presents an incorrect view of both the price and quantity of providing reliability service in PJM.⁷⁶

Hence, the key issue, according to PJM itself, is not whether capacity payments have a “causal link” to a resource’s market participation, but whether the resource will “effectively provide[] a reliability service”—the very same rule that Commission Orders 841 and 2222 establish. In this proceeding, PJM does an about face and ignores that rule.

In fact, there is no “causal link” between capacity payments and being in service for the majority of all capacity resources. For generators, PJM’s Independent Market Monitor calculates an “Avoidable Cost Rate” (ACR), which is the loss (or gain) the generator can expect absent the

⁷⁴ Revisions to Application of Minimum Offer Price Rule, PJM Interconnection L.L.C., Docket No. ER21-2582-000, at 6 (July 30, 2021).

⁷⁵ *Id.*

⁷⁶ *Id.* at 8.

capacity market. A positive ACR indicates the generator would operate at a loss absent capacity payments, and so establishes a causal link between the capacity market and that generator's continued operation. A zero or negative ACR indicates the generator is profitable even without capacity payments, indicative that there is no causal link between the capacity market and the generator's continued operation.

The IMM's analysis of unit ACRs in PJM shows that nearly all technologies deployed in PJM, including gas CT, gas CC, multi-unit nuclear, coal, onshore wind, and solar have an ACR of zero or less.⁷⁷ This is borne out by the supply curves published by PJM after each RPM auction, which indicate that at least half of all capacity resources offer at zero.⁷⁸ These offers demonstrate that much of PJM's generation fleet will continue to operate absent any capacity revenues. Consistent application of a "causal link" standard would dictate that these resources receive no capacity payments.

PJM argues in favor of eliminating EE payments because they do not cause an "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."⁷⁹ Non-discriminatory application of this standard would eliminate capacity payments to any generators that do not cause an incremental increase in supply over and above actions that (1) generation owners would have taken regardless of capacity revenues or (2) are already funded through existing revenue streams. The IMM's ACR calculations and PJM data demonstrate that this would apply to over half of PJM's generation fleet.

⁷⁷ Monitoring Analytics, *CONE and ACR Values – Preliminary* (Jan. 2020). As a practice matter, the IMM reports negative ACRs as zero. Available at https://www.monitoringanalytics.com/reports/Reports/2020/IMM_CONE_ACR_Preliminary_Report_20200121.pdf To our knowledge, no non-preliminary version of this report has been published.

⁷⁸ See, e.g., *2024/2025 Supply Curves for Base Residual Auction*, p1. Available at <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2024-2025/2024-2025-supply-curves-for-bra.ashx>.

⁷⁹ Filing at 3.

PJM’s proposal would unduly discriminate against energy efficiency by applying the novel “causal link” requirement to energy efficiency alone. PJM’s approach would exclude an entire class of cost-effective capacity resources on a flawed factual premise, resulting in rates that are not just and reasonable.

C. PJM incorrectly assumes that end-use customers receive the benefit of reduced load obligations.

PJM’s third justification for excluding energy efficiency from the capacity market is that “consumers that install energy efficiency measures already reap the economic benefit of lower capacity costs through a lower peak load obligation.”⁸⁰ PJM asserts that “load serving entities and their consumers accrue the benefits of lower capacity costs . . . 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.”⁸¹

The Commission resolved this issue over fifteen years ago when it first approved inclusion of Energy Efficiency Resources in the RPM. At that time, FERC found that “many retail customers who install energy efficiency measures do not capture the capacity benefit of the resources they install.”⁸² The relevant rules for capacity cost allocation have not changed since FERC made that finding, and PJM offers no evidence that they have.

The Commission’s original explanation that EE payments to retail customers do not duplicate their bill savings relied heavily on the “four year lag after an EE resource is initially installed before its load-reducing effects are reflected in PJM’s load forecast.”⁸³ This results in a corresponding delay in the retail customer seeing the full bill reduction of their EE measures.

⁸⁰ Filing at 2-3.

⁸¹ Filing at 39.

⁸² Original EE Order at ¶ 131.

⁸³ *Id.* ¶ 132.

PJM does not engage this issue, much less offer any changed circumstances that would lead the Commission to reverse its conclusion. Indeed, other than changes in auction timing, the only materially changed circumstance is the revelation that it can take as long as eighteen years for load reductions to be fully reflected in forecasts.⁸⁴

Moreover, as with PJM's first two arguments, PJM's position relies on a flawed factual premise—in this case, that end-use customers who reduce their peak load contribution receive the benefit of lower capacity costs. In reality, most retail bills consist of two basic charges—a volumetric rate that varies one-for-one with electricity usage, and a fixed monthly charge that is the same across an entire customer class. Retail rates typically do *not* provide any economic benefit to customers who reduce their peak load contributions.⁸⁵

PJM's position that reduced load obligations provide an adequate incentive for energy efficiency amounts to an argument against *all* demand-side capacity resources. The mechanism by which energy efficiency provides capacity—by reducing an end-use customer's peak load—is identical to the mechanism on which resources like demand response rely. If the economic benefit of reduced capacity obligations provides sufficient compensation for energy efficiency, the same should be true of demand response. Of course, as PJM itself recognizes, demand response resources that provide load reductions below their prior peak load should—and do—receive compensation for those reductions through the RPM.⁸⁶

PJM's argument highlights an important rationale for allowing energy efficiency to participate in capacity markets as a supply-side resource: capacity market payments enable

⁸⁴ See Tom Falin, *Peak Load Shaving Analysis: Impact on Zonal Load Forecast & Capacity Allocation* (May 2016), p2-3. Available at <https://www.pjm.com/-/media/committees-groups/task-forces/scrstf/20160506/20160506-item-01a-effect-of-load-reductions-10cp-version.ashx>

⁸⁵ Even "time-of-use" rate designs, which encourage reduced usage with higher prices during high-demand times of day, typically do not provide customers with the full benefit of the capacity value of their peak load reductions.

⁸⁶ Filing at 34 (quoting *PJM Interconnection, L.L.C.*, 137 FERC ¶ 61,108, at P 66 (2011)).

market signals to a broader cross-section of energy efficiency providers. If PJM relies on the load forecast alone to capture energy efficiency investments, only Load-Serving Entities will receive a direct market signal in the form of their reduced capacity obligation. But LSEs have very little incentive to innovate to reduce peak load, as they can pass capacity costs onto end-use customers in the form of higher rates. As discussed above, those rates typically hide the true cost of a customer's peak load contribution. The market signal is muted.

In contrast, the market signal rings loud and clear when providers can bid energy efficiency resources into the capacity market as supply.⁸⁷ Among other benefits, the supply-side approach creates an incentive for merchant energy efficiency providers to enter the market. As the Brattle Group's Kathleen Spees has explained, "[e]nabling additional competition by merchant EE in the capacity market facilitates competition and innovation."⁸⁸ Fostering competition and innovation is exactly why the Commission has repeatedly endorsed open markets over the past 15 years. PJM now asks the Commission to turn-away from that time-honored principle.

IV. The Commission should reject PJM's Filing and comprehensively address reforms needed to maximize consumer benefit from EE participation in capacity market in a separate 206 proceeding.

PJM's filing would unduly discriminate against energy efficiency and results in rates that are not just and reasonable. We accordingly urge the Commission to reject PJM's filing. At the same time, we recognize that the RPM's treatment of energy efficiency needs improvement. In particular, we share the concerns expressed by the Consumer Advocates under Docket No.

⁸⁷ Kathleen Spees et al., *The Benefits of Energy Efficiency Participation in Capacity Markets*, The Brattle Group, at 1 (Apr. 1, 2021), <https://www.aee.net/hubfs/The%20Benefits%20of%20Energy%20Efficiency%20Participation%20in%20Capacity%20Markets1.pdf>

⁸⁸ *Id.* at 8.

EL24-118 that PJM's approach to the load forecast and the addback results in double counting, and excessive costs for customers.

For that reason, we encourage the Commission to pursue a broader solution to the double-counting issue by directing a technical conference pursuant to the request of the Consumer Advocates under Docket No. EL24-118. Such a technical conference should, at a minimum, seek to identify which types of resources the PJM Load Forecast captures so that resources not reflected in the load forecast may continue to participate as supply-side resources in the RPM. Such a technical conference should also consider whether it is more efficient as a general matter to compensate energy efficiency providers as supply-side resources or to include them as part of the load forecast. The technical conference may also evaluate the models that other ISOs use to incorporate energy efficiency into their capacity constructs, including MISO and ISO-NE.

Ultimately, by pursuing a broader solution based on a complete record developed through a technical conference, the Commission can make an informed decision. PJM's filing, which elides or misstates important facts, does not provide a basis to do so.

V. Conclusion

PJM asks the Commission to break from its embrace of open markets by singling out energy efficiency for exclusion from the PJM capacity market. The primary factual basis for PJM's request—that the load forecast already reflects Energy Efficiency Resources—is incorrect, as PJM's forecast and the EIA data on which it relies in fact do not include important categories of energy efficiency. Moreover, PJM's proposal would establish a new requirement, applicable only to energy efficiency, that capacity resources may only participate in capacity markets if they can show a "causal link" between capacity payments and market participation.

Taken as a whole, PJM's proposal unduly discriminates against energy efficiency and would result in rates that are not just and reasonable.

The Commission should accordingly reject PJM's filing. In order to address the widely-recognized problems with PJM's current approach to Energy Efficiency Resources, the Commission should accept the Consumer Advocates' request for a technical conference under Docket No. EL24-118. That approach would allow the Commission to fully evaluate the myriad factual questions at issue, and ultimately find a path to maximize energy efficiency's value as a capacity resource in PJM.

Respectfully submitted this 27th of September, 2024,

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Chicago, Illinois, this 27th day of September, 2024.

/s/ Nicholas Wallace

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EXHIBIT A



September 26, 2024

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Andrew Gledhill
Manager, Resource Adequacy Planning
PJM

Dear Mr. Gledhill,

My name is Mike Cham. I am CTO of Encentiv Energy, a company that tracks all utility energy efficiency commercial rebates for the US and Canada. I've been working in the energy efficiency industry for 10 years. Many of our customers are the energy efficient product manufacturers whose products are purchased with energy efficiency incentives. One of our software products is deployed publicly on many manufacturer websites. A few examples:

- <https://www.acuitybrands.com/resources/retrofit-and-renovation/energy-efficient-products>
- <https://www.trane.com/commercial/north-america/us/en/decarbonization/rebate-finder.html>

We also publish a free public version of our database at <https://app.utilitygenius.com/>

I'm bringing to your attention that deficiencies in how the US Energy Information Administration(EIA) accounts for state and utility energy efficiency programs in the Annual Energy Outlook(AEO) limits and underrepresents the impact of energy efficiency activity in your load forecast. To be clear, I don't believe there is any issue with your forecast methodology. It seems sound and reasonable. And most of the 3rd party information feeding your forecast model is excellent. However, the AEO has some issues regarding energy efficiency incentives. The AEO is an excellent product and the staff at the EIA should be commended for the hard work and insightful model they have put together with NEMS, it is truly an invaluable resource. But, utility energy efficiency incentives are an arcane and difficult to collect and standardize

data set that are independently created by hundreds of unique utility entities under the jurisdiction of 51 different governing authorities and legislatures.

My research indicates that the AEO does not adequately account for these state and utility energy efficiency incentives to a substantial degree and since the AEO is such a fundamental part of your analysis, it has a concerning impact on the accuracy of your forecast. An accurate load forecast is obviously very important to you and to your constituents so I want to share my findings and see if there is a way I can help. I've reached out to several PJM stakeholders and energy efficiency organizations to review my research and they all suggested to reach out directly to PJM to share the results.

PJM's recent re-evaluation of energy efficiency resources in the capacity market sparked my curiosity on how utility energy efficiency incentive activity was captured in the load forecast and caused me to initiate research into that topic.

Research & Analysis

I reviewed the following related documentation, primarily:

- PJM Model Review Final Report From Itron - <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/pjm-model-review-final-report-from-itron.ashx>
- PJM 2024 Load Forecast Supplement: <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/load-forecast-supplement.ashx>
- PJM Interconnection, L.L.C. submits response to the 06/20/2024 Complaint of Joint Consumer Advocates under EL24-118. <https://www.pjm.com/-/media/documents/ferc/filings/2024/20240710-el24-118-000.ashx>
- PJM Interconnection, L.L.C. supplements its 07/10/2024 response to the 06/20/2024 complaint of Joint Consumer Advocates under EL24-118. <https://www.pjm.com/-/media/documents/ferc/filings/2024/20240729-el24-118-000.ashx>
- The National Energy Modeling System: An Overview - [https://www.eia.gov/outlooks/aeo/nems/overview/pdf/0581\(2023\).pdf](https://www.eia.gov/outlooks/aeo/nems/overview/pdf/0581(2023).pdf)
- Commercial Demand Module - NEMS Documentation <https://www.eia.gov/analysis/pdfpages/m066index.php>
- Residential Demand Module - NEMS Documentation <https://www.eia.gov/analysis/pdfpages/m067index.php>

- Assumptions to the Annual Energy Outlook 2023: Commercial Demand Module https://www.eia.gov/outlooks/aeo/assumptions/pdf/CDM_Assumptions.pdf
- Assumptions to the Annual Energy Outlook 2023: Residential Demand Module: https://www.eia.gov/outlooks/aeo/assumptions/pdf/RDM_Assumptions.pdf

The key activity here is that in the residential and commercial demand modules the EIA conducts a technology decision analysis for when a building decides to do an upgrade. They use prices and efficiencies of various product types to determine the economic factors that decision makers would rely on to determine whether to purchase average efficient products or higher efficient products, typically using a lifetime cost or payback analysis. This cost/benefit analysis is where utility energy efficiency incentives are utilized. The EIA computes what percentage an average utility rebate makes up of a higher efficiency product's cost which in turn is used in the Residential and Commercial Demand Module's technology choice algorithm. So the higher the rebate, the more likely a buyer is going to choose a higher efficiency product. The EIA uses several data sources to compute an average utility rebate per various product categories in each of their census zones. An example of those tables are included in the "Assumptions to the..." publications.

The EIA's published average rebate as a % of product cost in the EIA documentation did not seem right to me based on our product experience with rebates and product manufacturers, so I began a conversation with the economists at the EIA. Over several weeks and various conversation threads my conversations with the EIA economists pointed me to their data sources and revealed several policy misunderstandings about how utility rebates affect the market.

I'll start with the data sources. The EIA primarily depends on the following sources for nationwide incentive information:

- CEE Program Summaries - <https://cee1.org/program-resources/>
- ENERGY STAR Program Summaries(DIME) - <https://www.energystar.gov/DIME>

Both the CEE and ENERGY STAR are providing a great service to the community. But both initiatives are reliant on voluntary contributions of incentive information from busy utility program personnel. There isn't a national standard for how to design energy efficiency incentives, so each utility is submitting as they see fit.

I examined both source closely and compared them to our database of incentives. I found the following deficiencies:

- Age- CEE in particular is always 2-3 years behind the publication of the AEO forecast. Here in September 2024, as the EIA works on the 2025 AEO, the CEE data is for utility incentives as of 2022.
 - Does this matter? Yes. Utility rebates have gotten more volatile especially for common measures like Lighting and HVAC.
 - My company, Encentiv Energy, produces an annual webinar and report for changes in commercial energy efficiency programs. It indicates common changes in programs rates of 50% or more. A link to the most recent one:<https://blog.encentivenergy.com/news/analysis-2024-utility-business-commercial-industrial-rebate-trends>
- Quality/Consistency– Both CEE and ENERGYSTAR sources are updated voluntarily by utilities. While admirable, it leads to errors and inconsistencies. Examples:
 - ComEd - Only providing midstream incentives for lighting
 - PECO HVAC - Incentive levels are too low by 80%
 - BGE HVAC - Incentive levels are too low by 40%
- Omissions – There is a lot of missing information. Some measures, utilities and some whole states are not represented in the data. Examples:
 - Commercial Outdoor lighting - Missing
 - Chillers - Missing
 - Virginia utilities(Dominion and AEP) - Missing
 - First Energy PA - Missing
 - PPL - No data
 - Potomac Edison - Missing
 - AEP Indiana Michigan Power - Missing

As to the policy misunderstandings, I learned the following:

- Midstream/Upstream programs are not accounted for. In the EIA's view, their Residential and Commercial choice models do not allow for the introduction of other actors in the rebate process. It assumes a direct interaction between the buyer and the utility in terms of whether a rebate can be introduced into the upgrade economics or not. The EIA considered the fact that midstream or upstream programs introduce a 3rd party, a retailer or distributor, meant that those incentives have to be ignored in their analysis.
 - Does this matter? Yes, a lot. The midstream and upstream program designs have been a staple of residential programs and increasingly commercial programs. Additionally, many utilities have been and continue to move to using these models as their sole or primary means for dispersing incentive dollars. This policy represent an existing and increasingly important issue for energy efficiency data accuracy

- An EIA assumption that midstream incentives are included in the public pricing that distributors display on their websites. The EIA checks its product cost assumption by comparing them to distributor public sites. It is NOT the standard practice for distributors to include net rebate pricing in their public site since midstream programs have a customer eligibility requirement to receive the incentive and distributors don't want to reduce product prices for ineligible transactions that they can't be reimbursed for.
 - Does this matter? Similar to the previous point, yes, a lot. To the outsider it would be logical to assume that a distributor would publish the lowest price possible, until you learn about the deeper workings of these programs and the risk of loss that distributors would have to take on to publish net rebate prices
- PJM's EER program. The EIA was unaware that PJM and other grid operators are operating energy efficiency programs, so those savings are also not accounted for in their model.

In the subsequent discussions with the EIA, they are examining how they can update the documentation to more explicitly describe their treatment of midstream and upstream programs.

Impacts:

My research and investigation leads me to find the following impacts:

- PJM load forecasts are missing load reductions for higher efficiency equipment that are sold with midstream/upstream rebates. This would cause there to be an underrepresentation of the amount of higher efficient equipment installed and lead to the EIA to publish higher energy use intensities than is correct across all geographies.
- PJM load forecasts are distorted by misrepresentations of product incentives by downstream rebates. This would lead to mostly underrepresentation of higher efficient product sales in specific utility territories for specific product types.
- PJM load forecasts are deficient with regards specific categories of products, like commercial outdoor lighting and chillers which are very significant sources of electrical demand

I'd like to offer a number of potential solutions, some of which are already in progress:

- Short-term work with EIA. The EIA has received permission from Encenriv to start examining our UtilityGenius site to help address some shortcomings in their data set.
- Longer term with EIA. The EIA published an RFI (<https://sam.gov/opp/60ca5c649bb943cab33a66871575b458/view>) and will move to an

RFP eventually to hire a contractor to improve the energy efficiency incentive collection process

- Allowing qualified energy efficiency measures to participate in capacity market. Both options for the EIA will take some time and may be years before fully addressed. It is possible to identify energy efficiency measures by type and geography that explicitly couldn't have been included in the EIA use intensities. For example:
 - The measures above that have been omitted from analysis like commercial outdoor lighting
 - Where a utility's rebate as a percentage of product cost is higher than the EIA's census average
 - Projects where midstream rebates would be qualified
 - Others
- I've been trying to think of a way you could adjust your load forecast to account for these deficiencies, but the way the EIA aggregates and averages these values into census regions and then runs their technology choice algorithms would make that mathematically impossible.

Conclusion

I hope this research and analysis is helpful to you. Utility energy efficiency incentives are difficult to work with in aggregate because each utility program can design them independently, so we have run into issues like this in other business areas. I am more than happy to answer any questions that you have. We are also happy to work with PJM to help determine solutions that can resolve these deficiencies.

Michael Cham

Mike Cham
CTO, Encentiv Energy

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