	)	
Hunterstown Gen Holdings, LLC	)	Docket No. EC24-42-000
	)	
Kestrel Acquisition, LLC	)	
	)	

COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to Rule 211 of the Commission's Rules and Regulations,[1] Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor ("Market Monitor") for PJM Interconnection, L.L.C. ("PJM"),[2] submits these comments responding to the applications for approval of a proposed transaction pursuant to Section 203 of the Federal Power Act and Part 33 of the Commission's Regulations in the above proceedings.

In the proposed transaction, Hunterstown Gen Holdings, LLC, an affiliate of LS Power, ("LS Power") will indirectly acquire all of the ownership interests of Kestrel Acquisition, LLC, the owner of the Hunterstown 810 MW combined cycle power plant ("Hunterstown CC"), the proposed "Transaction."

The Market Monitor provides its analysis of the proposed transaction in a report ("Market Monitor Report"). The Market Monitor files a public version of the Market Monitor Report with redactions as an Attachment, and files separately a nonpublic confidential version.

---

[1]   18 CFR § 385.211 (2023).

[2]   Capitalized terms used herein and not otherwise defined have the meaning used in the PJM Open Access Transmission Tariff ("OATT"), the PJM Operating Agreement ("OA") or the PJM Reliability Assurance Agreement ("RAA").

The Market Monitor does not oppose the proposed Transaction, provided that any order approving the Transaction requires three specific behavioral commitments by LS Power, none of which creates a burden on applicants because all are designed to ensure competitive behavior. These behavioral commitments are defined and explained in the Market Monitor Report.

The report provides an assessment of the impact of the proposed Transaction on the structure of the PJM energy and capacity markets and its implications for market power in both markets, using recent constraint defined markets. FERC's approach to merger policy also applies to acquisitions like this one. In conducting this analysis the Market Monitor used market data including market shares and the results from the PJM test for structural market power, the three pivotal supplier test (TPS). The Market Monitor used market data to define the relevant markets and to examine the effects of the proposed acquisitions on those markets using concentration ratios and pivotal supplier indices. The Commission has accepted and considered similar analyses when evaluating proposed mergers and acquisitions in PJM.[3] The proposed Transaction increases structural market power in the aggregate energy market and in local markets defined by transmission constraints, as measured by both HHI results and pivotal supplier scores. The proposed Transaction increases structural market power in the capacity market, as measured by both the HHI and pivotal supplier scores. LS Power currently has market power in the PJM energy and capacity markets, and adding the Hunterstown CC to its fleet will increase its market power. The Market Monitor recommends behavioral remedies to address flaws in PJM's energy market power mitigation rules to

---

[3] *See, e.g., PSEG New Haven LLC, et al.*, 178 FERC ¶ 61,091 (2022); *PPL Corporation, RJS Power Holdings LLC*, 149 FERC ¶ 61,260 (2014); *NRG Energy Holdings, Inc., Edison Mission Energy*, 146 FERC ¶ 61,196 (2014); *Exelon Corporation, Constellation Energy Group, Inc.*, 138 FERC ¶ 61,167 (2012); *see also Analysis of Horizontal Market Power under the Federal Power Act*, 138 FERC ¶ 61,109 (2012) ("We reiterate, however, that the Commission may consider arguments that a proposed transaction raises competitive concerns that have not been captured by the Competitive Analysis Screen. Likewise, while applicants must continue to provide a Competitive Analysis Screen, we will also consider any alternative methods or factors, if adequately supported.").

ensure that LS Power cannot exercise market power as a result of the Hunterstown CC acquisition. Absent a reorganization of the entire market, structural remedies for individual transactions are not likely to be as effective as behavioral remedies because the structural remedies are generally based on an unrealistic, static view of market structure.

The Market Monitor does not oppose approval of the proposed transaction, provided that any order approving the transaction requires four specific behavioral commitments by LS Power to prevent the exercise of market power in the energy and capacity markets.

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as it resolves the issues raised in this proceeding.

Respectfully submitted,

Jeffrey W. Mayes

Joseph E. Bowring
Independent Market Monitor for PJM
President
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8051
joseph.bowring@monitoringanalytics.com

Jeffrey W. Mayes
General Counsel
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8053
jeffrey.mayes@monitoringanalytics.com

Catherine A. Tyler
Deputy Market Monitor
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8050
catherine.tyler@monitoringanalytics.com

Alexandra Salaneck
Senior Analyst
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8050
alexandra.salaneck@monitoringanalytics.com

Dated: February 6, 2024

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 Eagleville, Pennsylvania,
this 6th day of February, 2024.

_____
Jeffrey W. Mayes
General Counsel
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8053
jeffrey.mayes@monitoringanalytics.com

ATTACHMENT

PUBLIC

Market Power Analysis:
LS Power Acquisition
of Hunterstown CC

The Independent Market Monitor for PJM

February 6, 2024

This page intentionally left blank.

Table of Contents

Introduction

This report was prepared by PJM's Independent Market Monitor (IMM). The report provides an assessment of the impact of LS Power's proposed purchase of Kestrel's Hunterstown natural gas combined cycle generation power plant on the structure of the PJM energy and capacity markets and its implications for local and aggregate market power in both markets. FERC's approach to merger policy also applies to acquisitions like this one. In conducting this analysis the IMM used market data including market shares and the results from the PJM test for structural market power, the three pivotal supplier test (TPS). The IMM used market data to define the relevant markets and to examine the effects of the proposed acquisitions on those markets.

The LS Power Hunterstown CC acquisition increases structural market power in the aggregate energy market, as measured by both HHI results and pivotal supplier scores. The LS Power Hunterstown CC acquisition increases structural market power in the capacity market, as measured by both the HHI and the pivotal supplier score. LS Power currently has market power in the PJM energy and capacity markets, and adding Hunterstown CC increases that market power. The IMM recommends behavioral remedies to address flaws in PJM's energy market power mitigation rules to ensure that LS Power cannot exercise market power as a result of the Hunterstown CC acquisition.

LS Power has increased its position in the PJM market through a series of acquisitions over the last twenty years. The Commission's rules evaluate the change in market power one transaction at a time, rather than accumulated market power. This report provides measures of LS Power's market power in the aggregate energy market, for which there are no PJM market power mitigation rules.

The IMM's behavioral remedies also protect against potential exercises of market power in the aggregate energy and capacity markets.

Sufficiency of PJM Market Power Mitigation

In Section 203 applications and market based rate applications, the Commission relies on the sufficiency of the market monitoring and market power mitigation provisions in the RTO's tariff to mitigate local market power within the RTO region.[1] If the market monitoring and market power mitigation provisions in the RTO's tariff are insufficient, detailed analysis of submarkets created by constraints within the RTO is necessary and

---

[1] *See Market-Based Rates for Wholesale Sales of Electric Energy, Capacity and Ancillary Services by Public Utilities*, Order No. 697, FERC Stats. & Regs. ¶ 31,252 at P 241 (2007), *order on reh'g*, Order No. 697-A, 123 FERC ¶ 61,055 (2008).

any market power created or enhanced by the merger or acquisition requires explicit mitigation to ensure market power is not exercised.[2]

As the PJM markets have evolved, the IMM has identified significant flaws in the market power mitigation provisions of the PJM tariff. Some flaws permit market participants to evade the explicit intent of the PJM market power mitigation rules. Other flaws are gaps in the PJM market power mitigation rules. The overstated Market Seller Offer Cap (MSOC) in the capacity market permitted market power to be exercised.[3] The Commission issued an order in Docket EL19-47 to remedy the market power mitigation issues in the capacity market.[4] The capacity market MSOC has been corrected, so that LS Power can appropriately rely on market power mitigation in the capacity market as long as the Commission's decision on MSOC, or its equivalent, remains in force. The Commission initiated a show cause proceeding in Docket EL21-78 to remedy market power mitigation issues in the energy market.[5] The show cause order identified (at PP 16–18) the following issues for investigation: (i) whether "the Tariff provisions that dictate how PJM determines which offer is least cost are not just and reasonable;" (ii) whether the Tariff "fails to contain provisions governing what happens if a seller is unable to meet its unit-specific parameters in real time;" and (iii) whether "discussion of a real-time process … should be outlined in the Tariff." In its November 30, 2023 Order, the Commission remedied issues with real-time parameters, issues (ii) and (iii), but did not address the process by which PJM chooses whether to mitigate the offer of a resource that is found to have market power by the Three Pivotal Suppliers test, issue (i).[6] But even correction of the flaws in the application of local market power mitigation rules would not address aggregate market power in the energy market and the incentives to exercise market power.

Summary

The IMM analyzed the effect of the LS Power purchase of Hunterstown CC on market power in the PJM aggregate energy market and local energy markets using data from

---

[2]   Order No. 697- A at P 111.

[3]   See "Analysis of the 2022/2023 RPM Base Residual Auction,"<http://www.monitoringanalytics.com/reports/Reports/2022/IMM_Analysis_of_the_20222023_RPM_BRA_20220222.pdf> (February 22, 2022). "Analysis of the 2022/2023 RPM Base Residual Auction - Revised," <http://www.monitoringanalytics.com/reports/Reports/2023/IMM_Analysis_of_the_20222023_RPM_BRA_Revised_20230113.pdf> (January 13, 2023).

[4]   *See Independent Market Monitor for PJM v. PJM*, 176 FERC ¶61,137 (2021), *reh'g denied*, 177 FERC ¶ 62,066 (2021), *further order on reh'g*, 178 FERC ¶61,121 (2022), *aff'd*, Vistra Corp. et al. v. FERC, Case No. 21-1214 et al. (D.C. Cir August 15, 2023), *cert. pending*.

[5]   *See* PJM Interconnection, L.L.C., 175 FERC ¶ 61,231 (2021).

[6]   *See* PJM Interconnection, L.L.C., 185 FERC ¶ 61,158 (2023).

2023. The IMM analyzed the effects of the LS Power purchase of Hunterstown CC on market power in the PJM capacity market using auction data for the 2023/2024 and 2024/2025 Base Residual Auctions. The transaction increases structural market power. The IMM does not oppose the transaction, subject to a requirement for defined behavioral commitments by LS Power, all designed to ensure competitive behavior.

Aggregate Energy Market

- **{BEGIN CUI//PRIV}**.
-
- **{END CUI//PRIV}**
- There are no rules in the PJM tariff to address aggregate market power in the energy market.

Local Energy Markets

- **{BEGIN CUI//PRIV}**
- **{END CUI//PRIV}**
- There are identified issues with PJM's market power mitigation rules for local market power that allow suppliers to exercise market power. The IMM's behavioral recommendations address these issues.

Capacity Market

- **{BEGIN CUI//PRIV}**
-
-
- **{END CUI//PRIV}**
- The current PJM market power mitigation rules for the capacity market are sufficient to prevent the exercise of market power within the capacity market auctions.

Behavioral Recommendations

The IMM recommends that LS Power commit to behavioral restrictions to prevent the exercise of market power.

1. A commitment to no crossing price and cost-based offer curves will ensure that a price-based offer curve with a high markup will not be chosen by PJM's least cost offer determination when a resource has local market power as determined by the TPS test.
2. A commitment to only submit operating parameters based on physical limits, as defined in the PJM tariff, will ensure that LS Power cannot use market power to operate inflexibly during weather alerts, emergencies, and periods when its units fail the TPS test.
3. A commitment to offers that do not to exceed the net avoidable cost rate, which is the current Market Seller Offer Cap, will help ensure that capacity market offers are competitive, even if the PJM market rules change.

Behavioral Recommendations

Based on the results of the market power analysis and the insufficiency of PJM market power mitigation, the IMM recommends that behavioral restrictions apply to LS Power's energy and capacity market offers to help ensure that market power mitigation is effective in preventing the exercise of market power.[7]

No Crossing Curves

For energy market offers, LS Power should be prohibited from submitting price-based offers that intersect (or cross) the cost-based offer for the resource.

Given the ability to submit offer curves with different markups at different output levels in the price-based offer, suppliers with market power can evade mitigation by using a low markup at low output levels and a high markup at higher output levels. Even when resources fail the TPS test, PJM frequently selects the price-based offer with the high markup based on its negative markup at low output levels. This occurs because PJM chooses between the price-based offer and the cost-based offer considering only the offers at the economic minimum output level in the real-time market and only the offers up to the projected dispatch point in the day-ahead market. Figure 1 shows an example of offers from a unit that has a negative markup at the economic minimum MW level and a positive markup at the economic maximum MW level. The result would be that a unit that failed the TPS test would be committed on its price-based offer that has a lower dispatch cost, even though the price-based offer is higher than cost-based offer at higher output levels and includes positive markups, inconsistent with the explicit goal of local market power mitigation. Frequently, resources with crossing curves committed on the price-based offer are dispatched into the high markup range of the offer curve, setting prices above marginal cost despite having market power.

---

[7]   *See In the Matter of the Merger of Exelon Corporation and Constellation Energy Group, Inc.*, Order No. 84698, Case No. 9271 (February 17, 2012) at 104–105 ("Order No. 84698"). Exelon and Constellation agreed to behavioral commitments regarding energy offer curves and operating parameters to prevent the exercise of market power, along with other behavioral commitments.

Figure 1 Offers with varying markups at different MW output levels
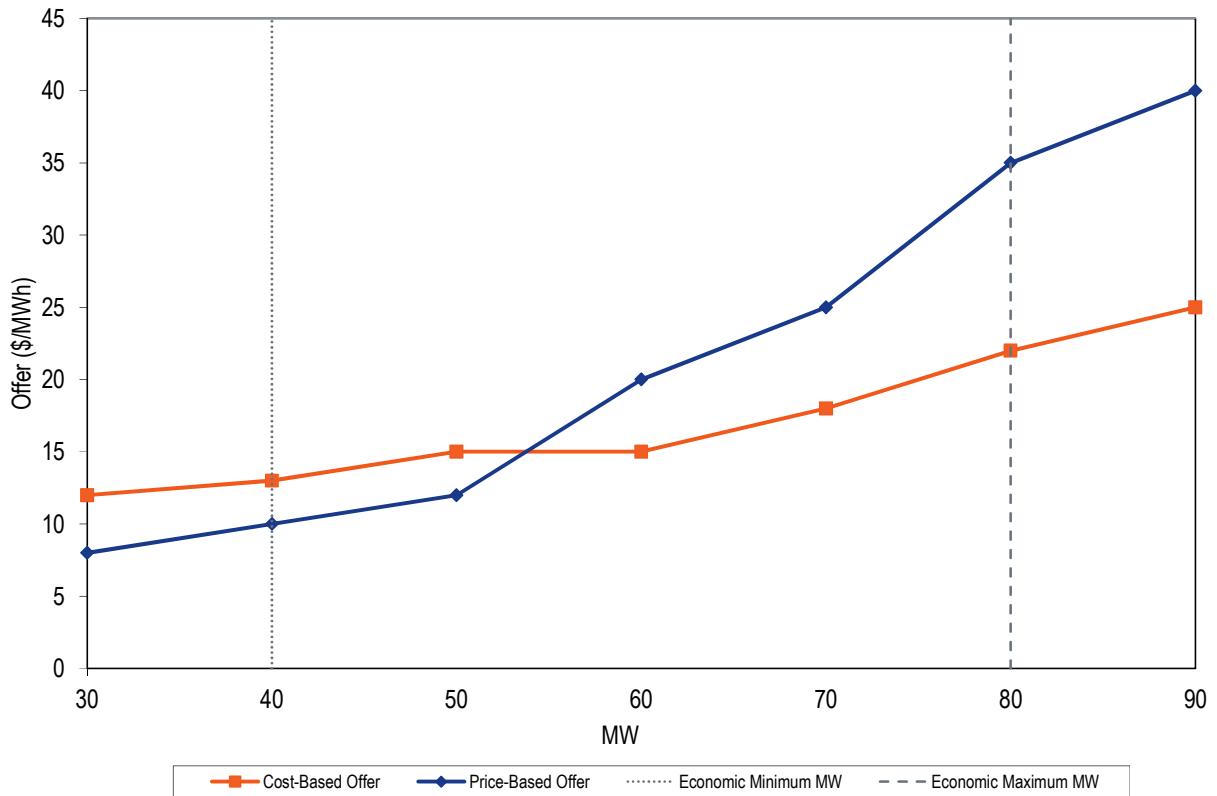
Physical Operating Parameters

For energy market offers, LS Power should be required to include operating parameters for its resources that are identical to their parameter limited schedules.

All resources in PJM are required to submit at least one cost-based offer. Cost-based offers, for a defined set of technologies, must include defined unit specific parameters, termed parameter limited schedules.

All resources that choose to make price-based offers are required to make available at least one price-based parameter limited offer with the same parameters as the cost-based offer (referred to as price-based PLS). For resources that are not capacity resources, the price-based parameter limited schedule is used by PJM for committing generation resources when a maximum emergency generation alert is declared. For capacity resources, the price-based parameter limited schedule is used by PJM for committing generation resources when hot weather alerts and cold weather alerts are declared.[8]

The current implementation is not consistent with the goal of having parameter limited schedules, which is to prevent the use of inflexible operating parameters to exercise

---

[8]   *See* PJM Operating Agreement, Schedule 1, Section 6.6.

market power. Instead of ensuring that parameter limits apply, PJM chooses the lower of the price-based schedule and the price-based parameter limited schedule during hot and cold weather alerts. Instead of ensuring that parameter limits apply, PJM chooses the lower of the price-based schedule and the cost-based parameter limited schedule when a resource fails the TPS test. This occurs because PJM chooses between the price-based offer and the cost-based offer considering only the offers at the economic minimum output level in the real-time market and only the offers up to the projected dispatch point in the day-ahead market, and does not consider all of the physical operating parameters. The result is that PJM frequently selects price-based offer schedules with inflexible parameters for resources that have market power.

Market Seller Offer Cap

For capacity market offers, LS Power should be required to use a market seller offer cap equal to its net Avoidable Cost Rate (ACR).

The net ACR is the marginal cost of capacity and is the competitive offer for a capacity resource. The currently applicable tariff includes this rule as a result of the Commission's ruling on an IMM complaint.[9] Regardless of whether the Court remands this matter to the Commission, the net ACR remains the competitive offer and LS Power should be required to offer net ACR as a condition of this acquisition.

Methods of Analysis

In analyzing whether a proposed merger or acquisition is consistent with the public interest, the Commission considers the "effect of the transaction on competition, rates, and regulation of the applicant by the Commission and state commissions with jurisdiction over any party to the transaction."[10] In this report, the IMM focuses on the first factor, the effect on competition, measured by the impact on the structure of relevant markets based on actual market data. The IMM evaluates the impact of the merger or acquisition using pivotal supplier analysis and concentration thresholds.

Any analysis of market structure depends on an accurate definition of the relevant markets. Market definitions depend on properly identifying and evaluating potential substitutes for a given product. Within organized markets data are available, and should be used, to define markets based on how the units are evaluated and dispatched to meet demand, based on network relationships between resources and load, relative costs, availability and operational parameters. Such an approach provides definitions of the

---

[9]   *See Independent Market Monitor for PJM v. PJM*, 176 FERC ¶61,137 (2021), *reh'g denied*, 177 FERC ¶ 62,066 (2021), *further order on reh'g*, 178 FERC ¶61,121 (2022), *aff'd*, Vistra Corp. v. FERC, Case No. 21-1214 et al. (D.C. Cir. August 15, 2023), *cert. pending*.

[10]   18 CFR § 33.2(g) (2022).

relevant markets based on actual operational data related to the participants and the markets in which they operate.

In the IMM analysis, the definition of the relevant local markets is based on the actual substitutability among available, relevant resources which in turn is based on the physical facts of the system and how the PJM markets defined the substitutability among available resources in the relevant markets over the analysis period. Rather than limit the analysis to a predefined range of load and price levels, the IMM has analyzed every actual relevant market defined by a constraint in the real-time look ahead tool used by PJM to identify structural market power, known as Intermediate Term Security Constrained Economic Dispatch (IT SCED). The relevant PJM submarkets defined in this analysis are those local energy markets created by transmission constraints within the broader PJM market that occurred for one hundred or more hours in 2023. The relevant capacity markets in this analysis are those that resulted from the actual operation of the markets for the 2023/2024 and 2024/2025 Delivery Years, the last two Base Residual Auctions run by PJM.

The IMM analysis of the relevant markets reflects the information available based on the actual operation of the PJM wholesale power markets, rather than static market definitions that ignore dynamic changes in constraints. The information used to prepare the analysis included in this report is highly confidential and market sensitive as it relates to specific market participants.[11]

Merger Standards

For the evaluation of the impact of a merger or acquisition on competition, FERC adopted the 1992 Horizontal Merger Guidelines ("1992 Guidelines") as the analytical framework as described in the Competitive Analysis Screen relied on by the Commission.[12]

The Commission reserves the opportunity to consider alternative approaches for analyzing the impact of proposed mergers and acquisitions, including pivotal supplier analyses similar to the analysis included in this report, when evaluating proposed mergers and acquisitions in PJM.[13]

---

[11] *See* OATT Attachment M–Appendix § I.

[12] *See* Order No. 642 *mimeo* at 4–5; U.S. Dept. of Justice & Federal Trade Commission, "Horizontal Merger Guidelines" (1992), as revised (1997). DOJ and FTC modified their guidelines in 2010, increasing their HHI and market share thresholds and expanding the criteria used to define the relevant market. U.S. Dept. of Justice & Federal Trade Commission, "Horizontal Merger Guidelines" (August 19, 2010). FERC considered whether to revise its policies to follow the DOJ and FTC 2010 modifications, but decided, after notice and inquiry, to retain the 1992 Guidelines. 138 FERC ¶61,109.

[13] *See Id.* at P 38 ("We reiterate, however, that the Commission may consider arguments that a proposed transaction raises competitive concerns that have not been captured by the

The 1992 Guidelines presented the enforcement policy of the Department of Justice and the Federal Trade Commission concerning horizontal mergers subject to section 7 of the Clayton Act, section 1 of the Sherman Act, and Section 5 of the Federal Trade Commission Act. As noted in the 1992 Guidelines, "[t]he unifying theme of the Guidelines is that mergers should not be permitted to create or enhance market power or facilitate its exercise."[14]

The Commissions' Competitive Analysis Screen, based on the 1992 Guidelines, uses market concentration, measured by the HHI, as a basic metric of the structural competitiveness of a market. The 1992 Guidelines define three basic levels of market concentration while recognizing that "[o]ther things being equal, cases falling just above and just below a threshold present comparable competitive issues."[15] A market with an HHI of less than 1000 is considered to be unconcentrated. Mergers and acquisitions resulting in HHI level less than a 1000 are not considered to have adverse competitive effects. A market with an HHI between 1000 and 1800 is considered to be moderately concentrated. A merger or acquisition resulting in a moderately concentrated market is not considered to have an adverse effect on competition if it increases the market's HHI by less than 100 points. A merger or acquisition resulting in a moderately concentrated market is considered to "potentially raise significant competitive concerns" if it increases the market's HHI by 100 points or more.[16] A market with an HHI of 1800 or above is considered to be highly concentrated. A merger or acquisition resulting in a highly concentrated market is not considered to have an adverse effect on competition if it increases the market's HHI by less than 50 points. A merger or acquisition producing an increase in the market HHI of 50 points or more in a highly concentrated market "potentially raises significant competitive concerns."[17]

In a market with an inelastic demand curve, the existence of two, or three, jointly pivotal suppliers, regardless of the amount of excess capacity available, does not provide a market structure that will result in a competitive outcome. An HHI in excess of 2500 does not demonstrate market power if the relevant owners are not jointly pivotal and are unlikely to be able to affect the market price. An HHI less than 2500 does not demonstrate the

---

Competitive Analysis Screen. Likewise, while applicants must continue to provide a Competitive Analysis Screen, we will also consider any alternative methods or factors, if adequately supported."); *Exelon Corporation, Constellation Energy Group, Inc.*, 138 FERC ¶ 61,167 (2012).

[14]   1992 Guidelines at 2.

[15]   1992 Guidelines at 15.

[16]   *Id*. at 16.

[17]   *Id.*

absence of market power if the relevant owners are jointly pivotal and are likely to be able to affect the market price.[18]

Higher concentration ratios indicate that comparatively small numbers of sellers dominate a market while lower concentration ratios mean larger numbers of sellers split market sales more equally. Lower aggregate market concentration ratios establish neither that a market is competitive nor that participants are unable to exercise market power. Higher concentration ratios do, however, indicate an increased potential for participants to exercise market power and an increased incentive to exercise market power. Despite their significant limitations, concentration ratios provide some useful information on market structure.

Notwithstanding the HHI level, a supplier may have the ability to raise market prices. If reliably meeting demand requires a single supplier, that supplier is pivotal and has monopoly power. If a small number of suppliers are jointly required to meet demand, those suppliers are jointly pivotal and have oligopoly power. The number of pivotal suppliers in the market is a more precise measure of structural market power than the HHI. The HHI is not a definitive measure of structural market power.

The residual supply index (RSI) is a measure of the extent to which one or more generation owners are pivotal suppliers in a market. A single generation owner is pivotal if the output of the owner's generation facilities is needed to meet demand. Multiple generation owners are jointly pivotal when the output of the owners' generation facilities, taken together, is needed to meet demand. When a generation owner is pivotal, it has the ability to affect market price. For a given level of market demand, the RSI compares the market supply, net of the supply controlled by one or more generation owners, to the market demand. The RSI value is calculated as a ratio, where total supply minus the supply of the tested suppliers is divided by the market demand. If the RSI is greater than 1.00, the supply of the specific generation owner(s) is not needed to meet market demand and that generation owner(s) has a reduced ability to influence market price. If the RSI is less than 1.00, the supply owned by the specific generation owner(s) is needed to meet market demand and the generation owner(s) is a pivotal supplier with an ability to influence price. When the RSI is reported for a market, the reported RSI is for the largest supplier or identified number of the largest suppliers. As with concentration ratios, the RSI is not a bright line test.

---

[18]   For detailed examples, see Joseph E. Bowring, PJM Market Monitor. "MMU Analysis of Combined Regulation Market," PJM Market Implementation Committee Meeting (December 20, 2006). <http://www.monitoringanalytics.com/reports/Presentations/2006/20061220-combined-regulation-market-mic.pdf>.

FERC indicates that a single supplier RSI of less than 1.0 is an indicator of market power.[19] In the PJM markets a three pivotal supplier RSI of less than 1.0 defines the existence of local market power. The three pivotal supplier test (TPS) defines market power even in the presence of market share and concentration levels that fall below 1992 Guidelines for a competitive market structure.[20] The TPS test uses a broader definition of competitors than FERC's single pivotal supplier approach.

Three Pivotal Supplier Test

In the IMM analysis, the basic metrics used for each market include market share, the Herfindahl-Hirschman Index (HHI), and the three pivotal supplier test (TPS), a residual supplier index used in the PJM markets to define locational market power. Market share measures the proportion of market output contributed by a supplier. Market share is calculated by dividing the output of a supplier by total cleared supply in a market. Concentration ratios are a summary measure of market share. The concentration ratio used here is the Herfindahl-Hirschman Index (HHI), calculated by summing the squares of the market shares of all firms in a market.

The IMM uses the three pivotal supplier test as the key measure of market structure and structural market power. The three pivotal supplier test is used in PJM markets to define the existence of local market power and as a trigger for market power mitigation. A test for local market power based on the number of pivotal suppliers has a solid basis in economics and is clear and unambiguous to apply in practice. There is no perfect test, but the three pivotal supplier test for local market power strikes a reasonable balance between the requirement to limit extreme structural market power and the goal of limiting intervention in markets when competitive forces are adequate.

The three pivotal supplier test, as implemented in PJM markets, is consistent with the Commission's market power tests, encompassed in the Delivered Price Test, which is the central calculation of the Competitive Analysis Screen required by the Commission. The three pivotal supplier test is used in the real-time energy market, the day-ahead energy market, the regulation market, and the capacity market. Like the Delivered Price Test, the three pivotal supplier test considers the interaction between individual participant attributes and features of the relevant market structure. Unlike the Delivered Price Test, the three pivotal supplier test takes into account the incremental ability of resources to affect prices in a constrained area from both the loading and relieve side of the constraint. The three pivotal supplier test is an explicit test for the ability to exercise unilateral market power as well as market power via coordinated action which accounts for market shares and the supply-demand balance in the market.

---

[19]   *See Midwest Independent Transmission System Operator, Inc.*, 121 FERC ¶ 61,190 at P 6 n.5 (2007).

[20]   *See AEP Power Marketing, Inc., et al.*, 107 FERC ¶ 61,018 at P 111 (2004).

The results of the three pivotal supplier test can differ from the results of the HHI and market share tests. The three pivotal supplier test can show the existence of structural market power when the HHI is less than 2500. The three pivotal supplier test can also show the absence of market power when the HHI is greater than 2500. The three pivotal supplier test is more accurate than the HHI and market share tests because it focuses on the relationship between demand and the most significant aspect of the ownership structure of supply available to meet it. An HHI in excess of 2500 does not indicate market power if the relevant owners are not jointly pivotal and are unlikely to be able to affect the market price. An HHI less than 2500 does not indicate the absence of market power if the relevant owners are jointly pivotal and are likely to be able to affect the market price.[21]

The three pivotal supplier test was designed in light of actual elasticity conditions in load pockets in wholesale power markets in PJM. The price elasticity of demand is a critical variable in determining whether a particular market structure is likely to result in a competitive outcome. A market with a specific set of market structure features is likely to have a competitive outcome under one range of demand elasticity conditions and a noncompetitive outcome under another set of elasticity conditions. It is essential that market power tests account for actual elasticity conditions and that evaluation of market power tests neither ignore elasticity nor make counterfactual elasticity assumptions. As the Commission stated, "In markets with very little demand elasticity, a pivotal supplier could extract significant monopoly rents during peak periods because customers have few, if any, alternatives."[22] The Commission also stated:

> In both of these models, the lower the demand elasticity, the higher the mark-up over marginal costs. It must be recognized that demand elasticity is extremely small in electricity markets; in other words, because electricity is considered an essential service, the demand for it is not very responsive to price increases. These models illustrate the need for a conservative approach in order to ensure competitive outcomes for customers because many customers lack one of the key protections against market power: demand response. [23]

The three pivotal supplier test is a reasonable application of the Delivered Price Test to the case of local markets that are defined by actual conditions in a market based on

---

[21] For detailed examples, see Joseph E. Bowring, PJM Market Monitor, "MMU Analysis of Combined Regulation Market," PJM Market Implementation Committee Meeting (December 20, 2006) <http://www.monitoringanalytics.com/reports/Presentations/2006/20061220-combined-regulation-market-mic.pdf> .

[22] AEP Order at P 72.

[23] *Id*. at P 103.

security-constrained, economic dispatch with locational market pricing and extremely inelastic demand. The three pivotal supplier test explicitly incorporates the relationship between supply and demand in the definition of pivotal, and it provides a clear test for whether excess supply is adequate to result in an adequately competitive market structure.

TPS Test: Defining the Relevant Market

The goal of defining the relevant market is to include those producers that actually compete to determine the market price. Conversely, the goal of defining the relevant market is to exclude those units that are not meaningful competitors and therefore do not have an impact on the clearing price. The existence of market power within that defined market depends on the ability of the producer to raise price while continuing to sell its output. A producer cannot successfully increase the market price above the competitive level if competitors would replace its output when it did so.

The Commission definition of the relevant market includes all suppliers with cost-based offers less than or equal to 1.05 times the clearing price. The Commission definition means that, if the marginal unit sets the clearing price based on an offer of $200 per MWh, all units with cost-based offers less than, or equal to, $210 per MWh have a competitive effect on the offer of the marginal unit. These units are all defined to be meaningful competitors in the sense that it is assumed that their behavior constrains the behavior of the marginal and inframarginal units. The TPS definition of the relevant market includes all suppliers with cost-based offers less than or equal to 1.50 times the clearing price. The three pivotal supplier definition means that, if the marginal unit sets the clearing price based on an offer of $200 per MWh, all units with costs less than, or equal to, $300 per MWh have a competitive effect on the offer of the marginal unit. These units are all defined to be meaningful competitors in the sense that it is assumed that their behavior constrains the behavior of the marginal and inframarginal units. The three pivotal supplier test incorporates a definition of meaningful competitors that is at the extreme high end of inclusive. It is questionable whether a unit with a competitive offer price of $300 offer meaningfully constrains the offer of a $200 unit. This broad market definition is combined with the recognition that multiple owners can be jointly pivotal. The three pivotal supplier test includes three pivotal suppliers while the Commission test includes only one pivotal supplier.

The three pivotal supplier test is designed to test the relevant market. For example, in the case of the market for out of merit generation needed to relieve a constraint in real time, the three pivotal supplier test examines the market specifically available to provide that relief. Under these conditions, the three pivotal supplier test measures the degree to which the supply from three generation suppliers is required in order to meet the demand to relieve a constraint, as defined by PJM's market solution software. The market demand

consists of the incremental, effective MW required to relieve the constraint.[24] The market demand is calculated as the difference between the defined MW limit on flow across the constraint and the flow in an economic dispatch solution if the limit did not exist (unconstrained flow). The market supply consists of the incremental, effective MW of supply available to relieve the constraint. This includes resources that can ramp up or start up to provide relief for the constraint as well as resources that can ramp down to provide relief for the constraint. The sign of the distribution factor (dfax) of a resource with respect to the defined constraint indicates whether a resource would relieve the constraint by increasing or decreasing output. A resource with a positive dfax with respect to a constraint provides relief by reducing the output, and a resources with a negative dfax with respect to the same constraint provides relief by increasing its output. For purposes of the test, incremental effective MW are attributed to specific suppliers on the basis of their control of the assets in question. Generation capacity controlled directly or indirectly through affiliates or through contracts with third parties are attributed to a single supplier.

Unlike structural tests that define markets by geographic proximity, the TPS test makes explicit and direct use of the incremental, effective MW of supply available to relieve the constraint at a distribution factor greater than, or equal to, the dfax used by PJM in operations. Only the supply that is part of the market as defined by the reality of the electric network as measured by unit characteristics and distribution factors is included in the three pivotal supplier test, to the extent that it is incremental, effective MW of supply available at a price less than, or equal to, 1.5 times the clearing price that would result from the intersection of demand (constraint relief required) and the incremental supply available to resolve the constraint.

Constraints: Defining the Relevant Market

In its Order Reaffirming the 1992 Guidelines (at P 43), the Commission stated:

> The Commission will remain flexible in its approach and will reevaluate whether a previously recognized submarket continues to exist if the evidence shows that the persistent transmission constraints that led to the recognition of that submarket are no longer present. We clarify that we will not require applicants to submit a DPT for an identified

---

[24] A unit's contribution toward effective, incrementally available supply is based on the dfax of the unit relative to the constraint and the unit's incrementally available capacity over current load levels, if the capacity in question is available within the period that the relief will be needed. Effective, incrementally available MW from an unloaded 100 MW 15-minute start combustion turbine (CT) with a dfax of -0.05 to a constraint would be 5 MW relative to the constraint in question. Effective, incrementally available MW from a 200 MW steam unit, with 100 MW loaded, a 50 MW ramp rate and a dfax of -0.5 to the constraint would be 25 MW.

> submarket if the applicants do not have overlapping
> generation within the submarket and lack firm transmission
> rights to import capacity into that market.

The applicants' Delivered Price Test considers the PJM RTO market and markets created by the 5004/5005 and AP South constraints. The IMM analyzed all potential submarkets. The IMM analysis shows that LS Power has local market power in PJM and that local market power with respect to the Nottingham constraint will increase with the Hunterstown CC acquisition.

The broader point about congestion is that it is dynamic and unpredictable. Submarkets in one period may not be submarkets in subsequent periods. The analysis of market power and of mergers should reflect these basic facts. Local market power may not exist in one period and may exist in the next. Local market power may exist in one period and not exist in the next. It is essential that merger reviews recognize that increased concentration of ownership creates the potential for market power beyond the specific facts of a specific period. It is essential for that reason to have clear, workable and enforceable rules for market power mitigation that can address the dynamic reality of PJM markets.

Energy Market Results

Aggregate Market Power

The IMM analyzed the impact of the proposed transaction on aggregate energy market concentration using actual generation data for 2023.

The concentration metrics are the market share for energy and the HHI for energy in the aggregate PJM market. The IMM also uses a pivotal supplier screen for the day-ahead energy market.

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 1 Increase in LS Power's average hourly market share of PJM generation

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 2 Increase in energy market HHI due to the LS Power/Energy Harbor transaction

{BEGIN CUI//PRIV}

{END CUI//PRIV}

To assess the number of aggregate pivotal suppliers in the day-ahead energy market, the IMM determines, for each supplier, the MW available for economic commitment that were already running or were available to start between the close of the day-ahead energy market and the peak load hour of the operating day. The available supply is defined as MW offered at a price less than 150 percent of the applicable locational marginal price because supply available at higher prices is not competing to meet the demand for energy. Generating units, import transactions, economic demand response, and virtual supply ("INCs"), are included for each supplier. Demand is the total MW required by PJM to meet physical load, cleared load bids, export transactions, and virtual demand ("DECs"). A supplier is pivotal if PJM would require some portion of the supplier's available economic capacity in the peak hour of the operating day in order to meet demand. Suppliers are jointly pivotal if PJM would require some portion of the joint suppliers' available economic capacity in the peak hour of the operating day in order to meet demand.

When LS Power is a pivotal supplier in the energy market, it has the ability to raise prices to the benefit of its inframarginal energy. There are no market power mitigation rules to address aggregate market power in the PJM energy market. Acquiring Hunterstown CC would increase LS Power's aggregate market power, increasing its incentive and ability to raise prices.

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 3 PJM Day-ahead energy market pivotal supplier frequency: 2023

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Local Market Power

The IMM also analyzed the energy market results for the relevant submarkets defined by actual binding constraints for 2023. The analysis identifies constraints for which LS Power has market power, as shown by failures of the TPS test.

The TPS test considers incremental, effective MW available to provide relief to binding constraints in the energy market. LS Power's fleet frequently has incremental, effective MW available to provide constraint relief in PJM's energy market that is measured by TPS test failures. Hunterstown CC also provides incremental, effective MW for constraint relief on some of the same constraints.

Table 4 identifies the constraints on the PJM system that were binding for more than 100 hours during 2023. It provides the number of hours for which LS Power failed the TPS Test and the number of hours for which LS Power would have failed the TPS Test with the Hunterstown CC acquisition.

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 4 Constraints where LS Power has market power as determined by the real-time energy market TPS test: 2023

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Capacity Market Results

The Reliability Pricing Model (RPM) Capacity Market design was implemented in the PJM region on June 1, 2007. The RPM Capacity Market is a forward-looking, annual, locational market, with a must offer requirement for Existing Generation Capacity Resources and mandatory participation by load, with performance incentives, that includes clear market power mitigation rules and that permits the direct participation of demand-side resources.

Under RPM, capacity obligations are annual. Base Residual Auctions (BRA) are held for delivery years that are three years in the future. Effective with the 2012/2013 Delivery Year, First, Second and Third Incremental Auctions (IA) are held for each delivery year.[25]

RPM prices are locational and may vary depending on transmission constraints and local supply and demand conditions.[26] Existing generation capable of qualifying as a capacity resource must be offered into RPM auctions, except for resources owned by entities that elect the fixed resource requirement (FRR) option. Participation by LSEs is mandatory, except for those entities that elect the FRR option. Load must buy all cleared capacity. There is an administratively determined demand curve that defines scarcity pricing levels and that, with the supply curve derived from capacity offers, determines market prices in each BRA. Under RPM there are explicit market power mitigation rules that define the

---

[25] *See* 126 FERC ¶ 61,275 at P 86 (2009).

[26] Transmission constraints are local capacity import capability limitations (low capacity emergency transfer limit (CETL) margin over capacity emergency transfer objective (CETO)) caused by transmission facility limitations, voltage limitations or stability limitations.

must offer requirement, that define structural market power using the three pivotal supplier test, that define offer caps, that define the minimum offer price, and that have flexible criteria for competitive offers by new entrants. Market power mitigation is effective only when these definitions are up to date and accurate. Demand resources and energy efficiency resources may be offered directly into RPM auctions and receive the clearing price without mitigation.

The capacity market is, by design, always tight in the sense that total supply is generally only slightly larger than demand. Local markets may have different supply demand balances than the aggregate market. Demand is inelastic because the market rules require loads to purchase their share of the system capacity requirement. The result is that any supplier that owns more capacity than the typically small difference between total supply and the defined demand is individually pivotal and therefore has structural market power. Any supplier that, jointly with two other suppliers, owns more capacity than the difference between supply and demand either in aggregate or for a local market is jointly pivotal and therefore has structural market power.

The market design for capacity leads, almost unavoidably, to structural market power in the capacity market. Given the basic features of the PJM Capacity Market, including significant market structure issues, inelastic demand, tight supply-demand conditions, the relatively small number of nonaffiliated LSEs and supplier knowledge of aggregate market demand, the potential for the exercise of market power is high. Market power is and will remain endemic to the existing structure of the PJM Capacity Market.

Nonetheless, a competitive outcome can be ensured by appropriate market power mitigation rules. Attenuation of those rules would mean that market participants would not be able to rely on the competitiveness of the market outcomes. However, the market power rules are not perfect and, as a result, competitive outcomes require continued improvement of the rules and ongoing monitoring of market participant behavior and market performance.

RPM currently has explicit market power mitigation rules designed to permit competitive, locational capacity prices while limiting the exercise of market power. The RPM construct is consistent with the appropriate market design objectives of permitting competitive prices to reflect local scarcity conditions while explicitly limiting market power. The RPM capacity market design provides that competitive prices can reflect locational scarcity while not relying on the exercise of market power to achieve that design objective by limiting the exercise of market power via the application of the three pivotal supplier test and the resultant offer capping.

The Commission modified the market seller offer cap (MSOC) by setting it equal to each resource's net avoidable cost rate, ensuring that offer capping results in competitive RPM prices.[27]

Markets

The analysis of the impact of the LS Power Hunterstown CC acquisition on the capacity market examines the locational markets defined by the underlying economics of the market including supply and demand curves and transmission constraints. Each transmission zone is a Locational Deliverability Area (LDA) which can be a separate submarket if PJM models the zone as an LDA and market conditions result in binding transmission constraints and associated price separation in an auction. There are, in addition, several defined subzonal LDAs, including PSEG North, DPL South, and ATSI Cleveland.

For the defined submarkets, market concentration and HHI levels were calculated on a preacquisition and a postacquisition basis for each market.

As in the energy market, to the extent that total RTO demand for capacity can be met without any constraints binding, the optimal solution is defined by the intersection of the aggregate supply and demand curves. However, if the next increment of demand for capacity in an LDA cannot be met by the next economic increment of total supply and must be met by higher cost supply within the LDA, then the transmission constraint is binding and there is a separate submarket created. That separate market is defined by the incremental demand that must be met by capacity within the LDA and the higher cost incremental supply within the LDA available to meet that demand.

The ability to exercise market power in the LDA is determined by the ownership structure of the incremental supply and the relationship between incremental supply and incremental demand. The incentive to exercise market power in the LDA is a function of the ownership structure of all capacity in the LDA. Regardless of offer price and regardless of whether the capacity was incremental, all capacity in a constrained LDA receives the higher constrained clearing price. The ability to exercise market power can be measured most accurately by the TPS test while the HHI provides a measure of the incentive to exercise market power.

When the capacity market clears as a single market, total RTO supply and demand determine the clearing price and all resources receive the clearing price. When an LDA within the RTO clears as a separate market, the incremental locational supply available to meet the locational demand determines the clearing price for the LDA. All capacity

---

[27]   176 FERC ¶ 61,137 (September 2, 2021).

resources in the LDA receive the clearing price, regardless of whether the capacity resources are incremental.

When there are multiple LDAs that clear as separate submarkets and the LDAs are not overlapping, the logic is exactly the same for each LDA separately and its relationship to the rest of RTO.[28] [29] When the LDAs are nested, the analysis becomes more complex.

Analysis

For this analysis, the actual sell offer prices and offered MW quantities in the 2023/2024 and 2024/2025 RPM BRAs were used.[30]

Total Market Analysis

Capacity Market Historic Analysis

LS Power's position in the PJM market has increased through a series of acquisitions over several years. The Commission analyzes market power one acquisition at a time. That approach does not address the long term growth in market share.

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 5 Increase in LS Power market share: 2007/2008 through 2024/2025

{BEGIN CUI//PRIV}

{END CUI//PRIV}

HHI Analysis

Table 6 shows pre and post LS Power Hunterstown CC acquisition HHIs for the 2023/2024 and 2024/2025 RPM Base Residual Auctions, including all modeled LDAs for each BRA. The HHIs in Table 6 measure concentration of ownership for all cleared capacity in the identified LDAs. **{BEGIN CUI//PRIV}**

---

[28] See "Analysis of the 2023/2024 RPM Base Residual Auction," <https://www.monitoringanalytics.com/reports/Reports/2022/IMM_Analysis_of_the_20232024_RPM_Base_Residual_Auction_20221028.pdf> (October 28, 2022).

[29] See the "Analysis of the 2024/2025 RPM Base Residual Auction," (October 30, 2023) <https://www.monitoringanalytics.com/reports/Reports/2023/IMM_Analysis_of_the_20242025_RPM_Base_Residual_Auction_20231030.pdf>.

[30] If the ownership of assets changed between the conduct of the BRA and the present, the current parent company ownership was used in both the preacquisition and postacquisition cases.

{END CUI//PRIV}

Table 6 Preacquisition and postacquisition HHI

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Incremental Market Analysis

Pivotal Supplier Analysis

The pivotal supplier analysis uses the pre and post acquisition Three Pivotal Supplier test scores to measure the change in market power for the RTO and LDAs. **{BEGIN CUI//PRIV}**.

{END CUI//PRIV}

The market for a constrained LDA is defined by the incremental supply available to meet the incremental demand when locational incremental demand must be met by capacity resources within the LDA. The RTO market is defined to include all supply that is not incremental supply in a constrained LDA. The RTO market includes all MW that resulted in the clearing price for the rest of RTO.

The three pivotal supplier (TPS) test measures the degree to which the incremental supply from three suppliers of capacity is required in order to meet the incremental demand in an LDA. The demand consists of the incremental MW of capacity required to relieve a constraint or clear a market. The supply consists of the incremental MW of supply available to relieve the constraint or clear the market.

{BEGIN CUI//PRIV}

{END CUI//PRIV}

Table 7 Preacquisition and postacquisition TPS results for LS Power

{BEGIN CUI//PRIV}

{END CUI//PRIV}