

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

**Calpine Corporation, Dynegy Inc., Eastern
Generation, LLC, Homer City Generation,
L.P., NRG Power Marketing LLC, GenOn
Energy Management, LLC, Carroll County
Energy LLC, C.P. Crane LLC, Essential
Power, LLC, Essential Power OPP, LLC,
Essential Power Rock Springs, LLC,
Lakewood Cogeneration, L.P., GDF SUEZ
Energy Marketing NA, Inc., Oregon Clean
Energy, LLC and Panda Power Generation
Infrastructure Fund, LLC,**

Docket No. EL16-____-000

Complainants,

v.

PJM Interconnection, L.L.C.,

Respondent.

NOTICE OF COMPLAINT

(March __, 2016)

Take notice that on March 21, 2016, Calpine Corporation, Dynegy Inc., Eastern Generation, LLC, Homer City Generation, L.P., NRG Power Marketing LLC, GenOn Energy Management, LLC, Carroll County Energy LLC, C.P. Crane LLC, Essential Power, LLC, Essential Power OPP, LLC, Essential Power Rock Springs, LLC, Lakewood Cogeneration, L.P., GDF SUEZ Energy Marketing NA, Inc., Oregon Clean Energy, LLC and Panda Power Generation Infrastructure Fund, LLC (Complainants) filed a formal complaint seeking fast-track processing pursuant to Sections 206 and 306 of the Federal Power Act alleging the PJM Interconnection, L.L.C. (PJM) Open Access Transmission Tariff is unjust and unreasonable because it does not include provisions to prevent the artificial suppression of prices by existing generation resources that are the beneficiaries of out-of-market revenues.

Complainants certify that copies of the complaint were served on the contacts for PJM, as listed on the Commission's list of Corporate Officials.

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing

to become a party must file a notice of intervention or motion to intervene, as appropriate. The Respondent's answer and all interventions, or protests must be filed on or before the comment date. The Respondent's answer, motions to intervene, and protests must be served on Complainants.

The Commission encourages electronic submission of protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically should submit an original and 14 copies of the protest or intervention to the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426.

This filing is accessible on-line at <http://www.ferc.gov>, using the "eLibrary" link and is available for review in the Commission's Public Reference Room in Washington, D.C. There is an "eSubscription" link on the web site that enables subscribers to receive email notification when a document is added to a subscribed docket(s). For assistance with any FERC Online service, please email FERCOnlineSupport@ferc.gov, or call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

Comment Date: 5:00 pm Eastern Time on (insert date).

Kimberly D. Bose
Secretary

**UNITED STATES OF AMERICA
BEFORE THE
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PJM Interconnection, L.L.C.,

Respondent.

COMPLAINT REQUESTING FAST TRACK PROCESSING

Pursuant to Sections 206 and 306 of the Federal Power Act (the “FPA”)¹ and Rule 206 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission (“FERC” or the “Commission”),² Calpine Corporation (“Calpine”), Dynegy Inc. (“Dynegy”), Eastern Generation, LLC (“Eastern Generation”), Homer City Generation, L.P. (“Homer City”), the NRG Companies,³ Carroll County Energy LLC (“Carroll County Energy”), C.P. Crane LLC (“CP

¹ 16 U.S.C. §§ 824e, 825e (2012).

² 18 C.F.R. § 385.206 (2015).

³ For purposes of this filing, the NRG Companies are NRG Power Marketing LLC (“NRG-PML”) and GenOn Energy Management, LLC (“GEM”).

Crane”), the Essential Power PJM Companies,⁴ GDF SUEZ Energy Marketing NA, Inc. (“GSEMNA”), Oregon Clean Energy, LLC (“Oregon Clean Energy”) and Panda Power Generation Infrastructure Fund, LLC (“Panda”) (collectively, “Complainants”) hereby submit this complaint (this “Complaint”) regarding the Minimum Offer Price Rule (the “MOPR”)⁵ in PJM’s Tariff. Complainants respectfully request that the Commission expand the MOPR to prevent the artificial suppression of prices in the Reliability Pricing Model (“RPM”) market by below-cost offers for existing resources whose continued operation is being subsidized by State-approved out-of-market payments.

Both PJM and the Independent Market Monitor for PJM (the “IMM”) have recognized the imminent threat to the RPM market from massive ratepayer-funded subsidies that the Public Utility Commission of Ohio (the “PUCO”) is poised to approve for existing resources owned by subsidiaries of American Electric Power Company, Inc. (“AEP”) and FirstEnergy Corporation (“FirstEnergy”) and the need for Commission action to address this threat in time for the Base Residual Auction (“BRA”) for the 2019/2020 Delivery Year (the “2019/2020 BRA”).⁶ Like PJM and the IMM, Complainants support pending complaints directed at abusive affiliate contracts (the “Affiliate PPAs”) that are integral to the AEP and FirstEnergy proposals.⁷ While expeditious

⁴ For purposes of this filing, the Essential Power PJM Companies are Essential Power, LLC (“Essential Power”), Essential Power OPP, LLC (“OPP”), Essential Power Rock Springs, LLC (“Rock Springs”) and Lakewood Cogeneration, L.P. (“Lakewood”).

⁵ This and other capitalized terms not otherwise defined herein have the meaning set forth in the PJM Interconnection, L.L.C. (“PJM”) Open Access Transmission Tariff (the “Tariff”).

⁶ See, e.g., Motion to Intervene and Comments in Support of PJM Interconnection, L.L.C. at 2, Docket No. EL16-33-000 (filed Feb. 23, 2016) (“PJM EL16-33 Comments”); Motion to Intervene and Comments in Support of PJM Interconnection, L.L.C. at 2, Docket No. EL16-34-000 (filed Feb. 23, 2016) (“PJM EL16-34 Comments”); Comments of the Independent Market Monitor for PJM at 3, Docket Nos. EL16-33-000, *et al.* (filed Feb. 23, 2016) (“IMM EL16-33/EL16-34 Comments”).

⁷ See Complaint Requesting Fast Track Processing, Docket No. EL16-33-000 (filed Jan. 27, 2016) (the “EL16-33 Complaint”); Complaint Requesting Fast Track Processing, Docket No. EL16-34-000 (filed Jan. 27, 2016) (the “EL16-34 Complaint” and, together with the EL16-33 Complaint, the “Affiliate

action on those complaints is needed, it is also imperative that the Commission grant this Complaint in advance of the 2019/2020 BRA, which is scheduled to be conducted in May 2016,⁸ in order to ensure that the 2019/2020 BRA will not be tainted by artificial price suppression.

INTRODUCTION AND EXECUTIVE SUMMARY

The purpose of RPM and other capacity markets is to “ensure both that existing generators are adequately compensated and that prices support new entry when additional capacity is needed.”⁹ The Commission has long recognized that these markets “will not be able to produce the needed investment to serve load and reliability if a subset of suppliers is allowed to bid noncompetitively to suppress market clearing prices,”¹⁰ and it has, therefore, approved measures, such as the MOPR, to protect the capacity markets from the price suppression that results from below-cost offers.¹¹

Until recently, the principal threat to the organized capacity markets has been from subsidized new entry. Accordingly, the MOPR currently applies only to certain new resources receiving out-of-market subsidies. As has been made clear by recent developments, however, the

Waiver Complaints”). Dynegy, Eastern Generation and the NRG Companies are among the complainants on the EL16-33 and EL16-34 Complaints.

⁸ See PJM, Auction Schedule, <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/rpm-auction-schedule.ashx>.

⁹ *Maine Pub. Utils. Comm’n v. FERC*, 520 F.3d 464, 473 (D.C. Cir. 2008) (“*Maine PUC*”) (internal citation omitted), *rev’d in part not relevant*, *NRG Power Mktg. LLC v. Maine Pub. Utils. Comm’n*, 558 U.S. 165 (2010).

¹⁰ *PJM Interconnection, L.L.C.*, 128 FERC ¶ 61,157 at P 90 (2008). See also, e.g., *New York Indep. Sys. Operator, Inc.*, 122 FERC ¶ 61,211 at P 103 (“*NYISO*”) (“Markets require appropriate price signals to alert investors when increased entry is needed. By allowing net buyers to artificially suppress prices, these necessary price signals may never be seen.”), *on reh’g*, 124 FERC ¶ 61,301 (2008), *on reh’g*, 131 FERC ¶ 61,170 (2010), *on reh’g*, 150 FERC ¶ 61,208 (2015).

¹¹ See *PJM Interconnection, L.L.C.*, 117 FERC ¶ 61,331 at PP 106-07 (2006) (“December 2006 Order”), *on reh’g*, 119 FERC ¶ 61,318, *on reh’g*, 121 FERC ¶ 61,173 (2007). See also, e.g., *ISO New England Inc.*, 135 FERC ¶ 61,029 at PP 165-66 (2011), *on reh’g*, 138 FERC ¶ 61,027 (2012); *NYISO*, 122 FERC ¶ 61,211 at PP 100-06.

restricted reach of the MOPR is unjust and unreasonable. In particular, a new threat has emerged in the form of subsidies to existing resources that create incentives for noncompetitive offers and that may prevent the exit of uneconomic resources. As discussed below and in the attached affidavit of Joseph Cavicchi, Executive Vice President of Compass Lexecon, provided in Attachment A hereto (the “Cavicchi Affidavit”), the AEP and FirstEnergy proposals would have just that effect with respect to over 6 GW of capacity in PJM. It is vital, therefore, that the Commission act to address this imminent and substantial threat to the RPM market, consistent with its past actions approving expansions of the MOPR where, as here, there was “mounting evidence of risk from what was previously only a theoretical weakness in the MOPR rules”¹²

While it is essential that the MOPR be expanded in time for the 2019/2020 BRA, Complainants recognize that PJM stakeholders have not had an opportunity to discuss changes to the MOPR to address the emerging threat of subsidized existing units. Accordingly, the proposed Tariff revisions proposed herein are narrowly-tailored to the immediate threat to the 2019/2020 BRA, and Complainants recognize that these revisions may not be sufficient as a permanent remedy. Complainants therefore respectfully request that the Commission find that the current MOPR is unjust and unreasonable and that, in addition to ordering PJM to revise the Tariff in time for the 2019/2020 BRA as proposed herein, the Commission direct PJM to initiate a stakeholder process to develop a long-term remedy to the problem of subsidized existing resources submitting noncompetitive offers into RPM Auctions and to file a proposed long-term remedy to this problem on or before November 1, 2016.

¹² See *PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,022 at P 139 (2011) (the “April 2011 Order”), *on reh’g*, 135 FERC ¶ 61,228, *on reh’g*, 137 FERC ¶ 61,145 (2011) (the “November 2011 Order”), *aff’d sub nom. New Jersey Bd. of Pub. Utils. v. FERC*, 744 F.3d 74 (3rd Cir. 2014).

Granting this Complaint is essential to address the imminent threat to the RPM market from the Affiliate PPAs. At the same time, it is equally important that the Commission grant the Affiliate Waiver Complaints in order to give itself the opportunity to review the Affiliate PPAs and to address the impacts of those contracts on the PJM energy and ancillary services markets and on captive Ohio consumers. The bottom line is that the Commission should grant both the Affiliate Waiver Complaints and this Complaint before the 2019/2020 BRA in order to protect the PJM markets and consumers.

Finally, while a serious threat to the PJM markets in their own right, the AEP and FirstEnergy proposals are only examples of a serious and growing threat to the RPM market: State-approved out-of-market subsidies to certain favored existing resources that then crowd out other existing and new resources which would otherwise be economic. In fact, as described herein, a new proposal before the PUCO illustrates that this threat has already spread and may continue to proliferate. As a result, even assuming *arguendo* that the Commission does not act in time for the 2019/2020 BRA, the Commission should still find the existing MOPR to be unjust and unreasonable and direct PJM to initiate a stakeholder process for purposes of expanding the MOPR to address this threat.

I.

CORRESPONDENCE AND COMMUNICATIONS

Complainants respectfully request that all correspondence and communications regarding this filing be addressed to the following persons, who should be placed on the Commission's official service list in this proceeding:¹³

¹³ Complainants respectfully request waiver of Rule 203(b) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.203(b) (2015), to the extent necessary to allow each of these individuals to be included on the official service list in this proceeding.

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II.

DESCRIPTION OF COMPLAINANT AND RESPONDENT

A. Complainants

1. Calpine

Calpine is a Delaware corporation engaged, through various subsidiaries, in the development, financing, acquisition, ownership, and operation of independent power production facilities and the wholesale marketing of electricity in the United States and Canada. Through its various subsidiaries, Calpine has a fleet of 84 power plants in operation or under construction, representing more than 27,000 MW of generation capacity. Through wholesale operations and its retail business, Calpine subsidiaries serve customers in 20 states and Canada. Calpine's subsidiaries own generating facilities in the PJM market, and are active in PJM's wholesale power markets.

2. Dynegy

Dynegy is a Delaware corporation that, through various subsidiaries, produces and sells electric energy, capacity, and ancillary services in various U.S. markets. Dynegy's power generation portfolio currently consists of approximately 26,000 MW of baseload, intermediate, and peaking power plants fueled by a mix of natural gas, coal, and fuel oil, including approximately 5,332 MW of generation in Ohio. Dynegy also has two retail electricity subsidiaries serving businesses and residents in Ohio and other states.

3. Eastern Generation

Eastern Generation is a wholly owned subsidiary of ArcLight Energy Partners Fund VI, L.P., a private equity fund managed by ArcLight Capital Partners, LLC. Eastern Generation recently indirectly acquired generation facilities with an aggregate generating capacity of

approximately 4,953 MW, including an approximately 825 MW natural gas-fired generation facility in Vinton County, Ohio.¹⁴

4. Homer City

Homer City is a Delaware limited partnership that is an indirect subsidiary of General Electric Company. Homer City owns the Homer City Electric Generating Station, an approximately 2,012 MW generation facility in Indiana, Pennsylvania. The output of this facility is sold into the PJM markets.

5. The NRG Companies

The NRG Companies are wholly owned subsidiaries of NRG Energy, Inc. (“NRG”) that market the output of affiliated generation in various markets. In Ohio, NRG’s affiliates sell electricity and capacity from its Avon Lake generating facility, facilitate the sale of Ohio demand response into PJM’s market, and sell retail electricity in Ohio. Nationwide, NRG owns over 53,000 MW of electric generating capacity throughout the United States.

6. Carroll County Energy

Carroll County Energy owns a 700 MW natural gas-fired, combined-cycle generator under construction in Carroll County, Ohio. Equity investors committed \$411 million in funds and a syndicate of 10 commercial banks provided an additional \$488 million in credit facilities to support the construction of the project. The development and financing of this project was predicated on the competitiveness of the PJM markets, the largest and most liquid competitive capacity and energy markets in the United States.

¹⁴ *Astoria Generating Co., L.P.*, 153 FERC ¶ 62,148 (2015) (approving the transaction).

7. CP Crane

CP Crane owns and operates an approximately 399 MW (summer rating) coal- and oil-fired generating facility in Baltimore County, Maryland, within the PJM footprint. CP Crane is a wholly owned subsidiary of Middle River Power LLC, which is, in turn, a wholly owned subsidiary of Avenue Energy Opportunities AIV, LP. CP Crane makes sales into the organized markets administered by PJM, including the RPM market.

8. The Essential Power PJM Companies

OPP, Rock Springs and Lakewood are subsidiaries of Essential Power that own generation facilities, with an aggregate generating capacity of approximately 907 MW, in the PJM footprint. They are active participants in the markets administered by PJM, including the RPM market.

9. GSEMNA

GSEMNA is a Delaware corporation and a wholly-owned subsidiary of GDF SUEZ Energy North America, Inc. (“GSENA”). GSEMNA is a power marketer operating under FERC-approved market-based rate authority that provides operational and wholesale commodity hedging services for GSENA’s portfolio of merchant generation, energy storage, liquefied natural gas, and retail power contract assets throughout the United States, including in the PJM footprint.

10. Oregon Clean Energy

Oregon Clean Energy developed and owns the Oregon Clean Energy Facility, an 860 MW natural gas-fired combined cycle generator located in the City of Oregon, Lucas County, Ohio. In November 2014, Oregon Clean Energy closed financing on a total investment exceeding \$800 million, including over \$400 million in equity contributions and an additional \$400 million in debt provided by a syndicate of 10 experienced project-finance banks. To date,

construction of the Oregon Clean Energy Facility is approximately 65 percent complete, placing the project on schedule to achieve commercial operation during the first quarter of 2017.

The Oregon Clean Energy Facility was financed and is being developed in direct response to the robust wholesale price signal provided by PJM's capacity and energy markets. Its investors' willingness to commit more than \$800 million to this Ohio-based project was predicated on their long-term confidence in PJM's markets. Oregon Clean Energy has the potential to develop an additional 860 MW facility in Ohio, and while Oregon Clean Energy would be interested in pursuing expansion, that expansion will require confidence in price signal provided by the PJM markets.

11. Panda

Panda is a private equity company seeking competitive opportunities in stable wholesale electricity markets to develop, construct, own, and operate electric generation facilities. Panda acts as investment manager and ultimately oversees the development, construction and operation of power plants, including five power plants in the PJM footprint totaling more than 4,000 MW of merchant capacity.

B. Respondent

PJM is the regional transmission organization ("RTO") for a region that covers all or part of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. As an RTO, PJM operates the region's transmission system and administers organized wholesale electricity markets pursuant to the Tariff.¹⁵

¹⁵ PJM is identified as the "respondent" to this Complaint, because this Complaint seeks modifications to the Tariff. The filing of this Complaint against PJM should not be construed as suggesting that PJM has done anything wrong. To the contrary, while Complainants would naturally

III.

BACKGROUND

A. The MOPR

As originally proposed and approved by the Commission in 2006, the MOPR was designed to address concerns that “net buyers might have an incentive to depress market clearing prices by offering some self-supply at less than a competitive level.”¹⁶ The original MOPR was subject to certain limitations, including, but not limited to, a net short requirement, which meant that the MOPR would applied only to entities purchasing substantially more capacity than they sold,¹⁷ and an exemption for resources developed in response to state or legislative sponsored mandates to address projected capacity shortfalls.¹⁸

Since its adoption in 2006, the MOPR has been revised on a number of occasions as new threats to the RPM market have emerged, and as PJM and market participants have gained experience with the rule. In 2011, PJM proposed modifications to the MOPR in response to the threat to the RPM market from New Jersey and Maryland initiatives providing out-of-market subsidies for new generation cleared in the RPM Auctions. In approving PJM’s proposal to eliminate an exemption for State-mandated resources, the Commission stated that “[t]he mounting evidence of risk from what was previously only a theoretical weakness in the MOPR rules that could allow uneconomic entry has caused us to reexamine our acceptance of the existing state exemption.”¹⁹ The Commission also accepted PJM’s proposal to eliminate an

have preferred that PJM propose modifications to the Tariff pursuant to Section 205 of the FPA, 16 U.S.C. § 825d (2012), they greatly appreciate PJM’s recognition of the threat to the market and its efforts to date to address that threat in time for the 2019/2020 BRA.

¹⁶ December 2006 Order, 117 FERC ¶ 61,331 at P 103.

¹⁷ See April 2011 Order, 135 FERC ¶ 61,022.

¹⁸ See *id.* at P 124.

¹⁹ *Id.* at P 139.

exemption for upgrades to, and added capacity at, existing combined cycle (“CC”) and combustion turbine (“CT”) plants, agreeing with PJM that “adding capacity to an existing CC or CT plant could potentially be an effective means of pursuing a price-suppression strategy.”²⁰ Finally, it eliminated the net short requirement, recognizing that this limitation would “enable a net buyer, or an entity acting on behalf of a net buyer, to evade mitigation by structuring a new entry transaction in such a way that achieves the same price-lowering effect without triggering the MOPR.”²¹

Even when it was approving, rather than eliminating, categorical exemptions from the MOPR in 2013, the Commission was still properly concerned about protecting the RPM market from the market-distorting effects of State-approved subsidies. For example, the Competitive Entry Exemption, added in 2013, applies only where the resource owner demonstrates that “no costs are recovered from customers either directly or indirectly through a non-bypassable charge linked to the construction, or clearing in any RPM auction, of the resource,” and that “it does not receive certain types of payments from any governmental entity connected with the construction/clearing of the resource in RPM.”²² Similarly, in accepting the Self-Supply Exemption in that same order, the Commission recognized that “the actions of one state in a multi-state RTO like PJM can have a significant impact on wholesale prices affecting loads in other states.”²³ Accordingly, it agreed that PJM should “use caution when determining whether resources developed through one state’s procurement process should receive an exemption from

²⁰ *Id.* at P 156.

²¹ *Id.* at P 87.

²² *PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,090 at P 28 (2013) (“May 2013 Order”) (footnote omitted), *on reh’g*, 153 FERC ¶ 61,066 (2015).

²³ *Id.* at P 58.

the MOPR,” and emphasized that, in order to receive such an exemption, “any such state process must maintain a level of openness and competitiveness comparable to RPM itself.”²⁴

In its current form, the MOPR provides that, unless exempted,²⁵ “[a]ny Sell Offer submitted in any RPM Auction for any Delivery Year based on a MOPR Screened Generation Resource shall have an offer price no lower than the MOPR Floor Offer Price”²⁶ For these purposes, a MOPR Screened Generation Resource is defined as:

any Generation Capacity Resource, and any uprate to a Generation Capacity Resource that is being, or has been, modified to increase the number of megawatts of available installed capacity thereof by 20 MW or more, based on a combustion turbine, combined cycle, or integrated gasification combined cycle generating plant (including Repowering of an existing plant whenever the repowered plant utilizes combustion turbine, combined cycle, or integrated gasification combined cycle technology) with an installed capacity rating, combined for all units comprising such resource at a single point of interconnection to the Transmission System, of no less than 20 MW²⁷

The MOPR Floor Offer Price, in turn, is defined as “the Net Asset Class Cost of New Entry for the relevant generator type and location.”²⁸ The requirement to submit Sell Offers no lower than the MOPR Floor Offer Price applies “until (and including) the first Delivery Year for which a Sell Offer based on the non-exempt portion of such resource has cleared an RPM Auction.”²⁹

²⁴ *Id.*

²⁵ The two categorical exemptions are the Self-Supply Exemption and the Competitive Entry Exemption mentioned above.

²⁶ Tariff, Attachment DD, § 5.14(h)(1).

²⁷ *Id.*, § 5.14(h)(2) (also providing that certain specified resources shall not be considered MOPR Screened Generation Resources).

²⁸ *Id.*, § 5.14(h)(3). There is also a unit-specific exemption process whereby suppliers may submit documentation justifying offers below the MOPR Floor Offer Price based on the resource’s economics for review by the IMM and PJM. *See id.*, § 5.14(h)(8).

²⁹ *Id.*, § 5.14(h)(4).

B. PUCO Proceedings Regarding The Affiliate PPAs And The Associated Non-Bypassable Charges

As discussed in greater detail below, the Ohio utility subsidiaries of AEP and FirstEnergy have requested PUCO approval for schemes under which Ohio retail ratepayers will subsidize over 6 GW of existing generation resources owned by their “unregulated” affiliates. Under these schemes, the utilities would purchase power from their “unregulated” affiliates pursuant to the Affiliate PPAs, re-sell the purchased power in the PJM markets, and then recover the difference through non-bypassable charges assessed to all retail customers in their service territories, even those customers that have chosen to take retail service from competitive suppliers.

1. PUCO Proceedings Regarding The AEP Proposal

In a December 20, 2013 application to the PUCO, AEP’s Ohio utility subsidiary, Ohio Power Company (“AEP Ohio”) proposed to establish a non-bypassable charge (the “AEP Rider”) to recover the costs it incurs in connection with its entitlement to the output of generation facilities owned by Ohio Valley Electric Corporation (“OVEC”) from all customers, including customers taking service from competitive retail suppliers, on a non-bypassable basis.³⁰ In a February 2, 2015 order, the PUCO approved the AEP Rider on a placeholder basis, with an initial rate of zero, leaving open the possibility that AEP Ohio could make future filings to justify the recovery of costs incurred under a particular power purchase agreement.³¹

In a separate application filed on October 3, 2014 and amended on May 15, 2015, AEP Ohio sought PUCO approval to recover the costs of a power purchase agreement (the “AEP

³⁰ See Ohio Power Company’s Electric Security Plan at 8-9, PUCO Case Nos. 13-2385-EL-SSO, *et al.* (filed Dec. 20, 2013) (“13-2385 Application”), <http://dis.puc.state.oh.us/TiffToPdf/A1001001A13L23B40635F07212.pdf>.

³¹ See *In the Matter of the Application of Ohio Power Co. for Auth. to Establish a Standard Serv. Offer Pursuant to R.C. 4928.143, in the Form of an Elec. Security Plan*, Order and Opinion at 19-27, PUCO Case Nos. 13-2385-EL-SSO, *et al.* (Feb. 25, 2015), <http://dis.puc.state.oh.us/TiffToPdf/A1001001A15B25B40110J73365.pdf>.

Affiliate PPA”) with an “unregulated” affiliate, AEP Generation Resources, Inc. (“AEP Generation”), through the AEP Rider.³² Specifically, AEP Ohio proposed to recover the costs incurred under the AEP Affiliate PPA less the revenues from its “liquidation” of the purchased power in the PJM markets through the AEP Rider.³³ Under the AEP Affiliate PPA, AEP Ohio will purchase the output of AEP Generation’s interests generating facilities with an aggregate generating capacity of approximately 2,671 MW (the “AEP Units”)³⁴ for the remaining operational life of the units.³⁵ AEP Ohio claimed that the AEP Affiliate PPA is needed to “protect Ohio’s economy and reduce the likelihood of premature retirements of the relevant AEP[Generation] generating plants due to short-term economic signals.”³⁶ It further asserted that the AEP Affiliate PPA is necessary in light of “flaws” in the RPM market that “have led to suppressed capacity prices and significant price volatility.”³⁷

Various parties, including PJM and the IMM, raised concerns regarding the impact of the proposed AEP Affiliate PPA and the AEP Rider on the PJM market before the PUCO.³⁸

³² See Application, PUCO Case No. 14-1693-EL-RDR, *et al.* (filed Oct. 3, 2014), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A14J03B31748I76343.pdf>; Amended Application, PUCO Case No. 14-1693-EL-RDR, *et al.* (filed May 15, 2015) (the “Amended AEP Application”), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15E15B61559D77793.pdf>.

³³ Amended AEP Application at 4.

³⁴ AEP Generation acquired the AEP Units from AEP Ohio on December 31, 2013. See *Ohio Power Co.*, 143 FERC ¶ 61,075 (2013), *on reh’g*, 146 FERC ¶ 61,016 (2014).

³⁵ See Direct Testimony of Kelly D. Pearce in Support of AEP Ohio’s Amended Application, Exh. KDP-1, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed May 15 2015) (summary of AEP Affiliate PPA terms), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15E15B62402I64570.pdf>.

³⁶ Amended AEP Application at 4.

³⁷ Direct Testimony of Pablo A. Vegas in Support of AEP Ohio’s Amended Application at 21, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed May 15, 2015), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15E15B61949I33668.pdf>.

³⁸ See Reply Brief of the PJM Power Providers Group and the Electric Power Supply Association, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed Feb. 8, 2016), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A16B08B64332E01361.pdf>; Brief for Amicus Curiae PJM Interconnection, L.L.C., PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed Feb. 1, 2016) (“PJM AEP Brief”), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A16B01B60837D00152.pdf>; Post-Hearing Brief of the Independent Market Monitor for

Notwithstanding these and other serious issues raised with respect to the AEP Ohio's proposal, including the billions of dollars in above-market costs being imposed on Ohio consumers,³⁹ there is every reason to expect that the PUCO will approve the proposal in advance of the 2019/2020 BRA given that the PUCO has already approved the AEP Rider and that PUCO Staff is now supporting AEP Ohio's proposal.⁴⁰

2. PUCO Proceedings Regarding The FirstEnergy Proposal

In an August 4, 2014 application to the PUCO, FirstEnergy's Ohio utility subsidiaries, Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company (collectively, the "FE Ohio Utilities"), proposed their fourth electric security plan ("ESP IV").⁴¹ A central element of ESP IV is a proposal to establish a non-bypassable charge (the "FE Rider" and together with the AEP Rider, the "Riders") to recover the costs of a power purchase agreement (the "FE Affiliate PPA") with an "unregulated" affiliate, FirstEnergy Solutions Corporation ("FE Solutions"), from all customers, including customers taking service from competitive retail suppliers, on a non-bypassable basis.⁴² Specifically, the FE Ohio Utilities proposed to recover the costs incurred under the FE Affiliate PPA less the revenues from the

PJM, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed Feb. 1, 2016) ("IMM AEP Initial Brief"), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A16B01B64418I00212.pdf>; Post-Hearing Reply Brief of the Independent Market Monitor for PJM, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed Feb. 8, 2016) ("IMM AEP Reply Brief"), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A16B08B71003A01395.pdf>.

³⁹ See Supplemental Direct Testimony of James F. Wilson on Behalf of the Office of the Ohio Consumers' Counsel at 10, PUCO Case Nos. 14-1693-EL-RDR, *et al.* (filed Dec. 28, 2015), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15L28B72148G02372.pdf>.

⁴⁰ See Joint Stipulation and Recommendation, PUCO Case No. 14-1693-EL-RDR, *et al.* (filed Dec. 14, 2015) (the "AEP Stipulation"), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15L14B60023H00068.pdf>.

⁴¹ See Application, PUCO Case No. 14-1297-EL-SSO (filed Aug. 4, 2014) (the "FE Application"), <http://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=7708e19d-64d4-42a4-ab52-00cfd4e10d7b>.

⁴² See *id.* at 9.

resale of the purchased power in the PJM markets through the FE Rider.⁴³ Under the FE Affiliate PPA, the FE Ohio Utilities will purchase the output of the generating facilities with an aggregate generating capacity of approximately 3,256 MW, including the W. H. Sammis Plant (the “Sammis Plant”), the Davis-Besse Power Station (the “Davis-Besse Station”) and FE Solutions’s OVEC entitlement (together with the AEP Units, the “PPA Units”), on a long-term basis.⁴⁴ The FE Ohio Utilities claimed that these arrangements were intended to “help ensure future service reliability as well as preserve \$1 billion in annual statewide economic benefits and nearly 3,000 direct and indirect jobs created by operations at the Davis-Besse [Station] and [the] Sammis [P]lant[] located in Ohio.”⁴⁵

Various parties, including PJM and the IMM, raised concerns regarding the impact of the proposed FE Affiliate PPA and the FE Rider on the PJM market before the PUCO.⁴⁶ Notwithstanding these and other serious issues raised with respect to the FE Ohio Utilities’ proposal, including the billions of dollars in above-market costs being imposed on Ohio consumers,⁴⁷ there is every reason to expect that the PUCO will approve the proposal in advance

⁴³ See *id.* To the extent revenues exceeded costs, retail customers would see a credit. See *id.*

⁴⁴ See *id.* at 2, 9. See also PUCO Exhibit Filing, Sierra Club Exh. 1, PUCO Case No. 14-1297-EL-SSO (filed Sept. 17, 2015), <http://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=2b6f449c-8fe9-44e8-98f4-ceb585eb707c>.

⁴⁵ FE Application at 2.

⁴⁶ See Joint Reply Brief of the PJM Power Providers Group and the Electric Power Supply Association, PUCO Case No. 14-1297-EL-SSO (filed Feb. 26, 2016), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B26B63345B05271>; Brief for Amicus Curiae PJM Interconnection, L.L.C., PUCO Case No. 14-1297-EL-SSO (filed Feb. 16, 2016) (“PJM FE Brief”), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B16B60102I02373>; Post-Hearing Brief of the Independent Market Monitor for PJM, PUCO Case No. 14-1297-EL-SSO (filed Feb. 16, 2016) (“IMM FE Initial Brief”), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B16B60421G02375>; Post-Hearing Reply Brief of the Independent Market Monitor for PJM, PUCO Case No. 14-1297-EL-SSO (filed Feb. 26, 2016) (“IMM FE Reply Brief”), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B26B65412H05295>.

⁴⁷ See Second Supplemental Direct Testimony of James F. Wilson on Behalf of the Office of the Ohio Consumers’ Counsel and Northeast Ohio Public Energy Council at 12, PUCO Case No. 14-1297-

of the 2019/2020 BRA given that the PUCO has already approved the AEP Rider, as well as a similar proposal by another Ohio utility,⁴⁸ and that PUCO Staff is now supporting the FE Ohio Utilities' proposal.⁴⁹

C. The Affiliate Waiver Complaints

Under the Commission's regulations, "no wholesale sale of electric energy or capacity may be made between a franchised public utility with captive customers and a market-regulated power sales affiliate without first receiving Commission authorization for the transaction under section 205 of the [FPA]."⁵⁰ For purposes of this restriction on affiliate power sales, AEP Ohio and the FE Ohio Utilities are "franchised public utilities,"⁵¹ and AEP Ohio's and the FE Ohio Utilities' "market-regulated power sales affiliates"⁵² include AEP Generation and FE Solutions, respectively. These and other subsidiaries of AEP and FirstEnergy obtained waivers of the affiliate power sales restrictions on the grounds that AEP Ohio and the FE Ohio Utilities no longer had captive customers due to the State of Ohio's implementation of retail choice.⁵³

EL-SSO (filed Dec. 30, 2015) (estimating costs of the Affiliate PPA to Ohio consumers as high as \$3.6 billion over the eight-year contract term), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15L30B45750G02894.pdf>

⁴⁸ *In the Matter of Application of Duke Energy Ohio, Inc. for Authority to Establish a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Elec. Security Plan, Accounting Modifications, & Tariffs for Generation Serv.*, Opinion and Order at 46-47, PUCO Case No. 14-841-EL-SSO, *et al.* (Apr. 2, 2015), <https://dis.puc.state.oh.us/TiffToPDF/A1001001A15D02B40703H86216.pdf>.

⁴⁹ *See* Third Supplemental Stipulation and Recommendation, PUCO Case No. 14-1297-EL-SSO (filed Dec. 1, 2015) (the "FE Third Stipulation"), <http://dis.puc.state.oh.us/TiffToPDF/A1001001A15L01A85343G03072.pdf>.

⁵⁰ 18 C.F.R. § 35.39(b) (2015).

⁵¹ *See* 18 C.F.R. § 35.36(a)(5) (2015).

⁵² *See* 18 C.F.R. § 35.36(a)(7) (2015).

⁵³ *See AEP Energy Partners, Inc.*, Docket Nos. ER14-593-000, *et al.* (Feb. 5, 2014) (unreported) (granting waiver of the affiliate power sales restrictions for subsidiaries of AEP); *FirstEnergy Solutions Corp.*, 125 FERC ¶ 61,356 (2008) (granting waiver of the affiliate power sales restrictions for subsidiaries of First Energy), *on reh'g*, 128 FERC ¶ 61,119 (2009).

On January 27, 2016, the Electric Power Supply Association, the Retail Energy Supply Association, Dynegy, Eastern Generation and the NRG Companies filed the Affiliate Waiver Complaints, asking that the Commission rescind the waivers as they relate to the Affiliate PPAs.⁵⁴ As explained in the Affiliate Waiver Complaints, the fact that the Riders are non-bypassable charges assessed to all retail customers, even those taking service from competitive retail suppliers, eviscerates the basis for those waivers where costs of the Affiliate PPAs are concerned.⁵⁵ Indeed, as further explained in those complaints, the Affiliate PPAs “strike[] at the heart of the Commission’s longstanding restrictions on affiliate transactions.”⁵⁶

The Affiliate Waiver Complaints warned that the Affiliate PPAs would not only impose billions of dollars in above-market costs on Ohio consumers but would also distort prices in the PJM markets as AEP Ohio and the FE Ohio Utilities would have incentives to submit below-cost offers for over 6 GW of power being purchased from their affiliates.⁵⁷ A diverse group of commenters echoed these concerns and urged the Commission to grant the Affiliate Waiver Complaints.⁵⁸ PJM, for example, stated that the incentives for below-cost bidding resulting from

⁵⁴ See EL16-33 Complaint; EL16-34 Complaint.

⁵⁵ See EL16-33 Complaint at 14-16; EL16-34 Complaint at 16-21.

⁵⁶ EL16-33 Complaint at 2; EL16-34 Complaint at 2.

⁵⁷ See EL16-33 Complaint at 18-20; EL16-34 Complaint at 24-27.

⁵⁸ See Supporting Comments of Calpine Corporation, Docket Nos. EL16-33-000, *et al.* (filed Feb. 23, 2016); Letter from Barbara Titus to Kimberly D. Bose, Docket Nos. EL16-33-000, *et al.* (filed Feb. 17, 2016) (comments of Hardwood Flooring & Paneling, Inc. d/b/a Sheoga Hardwood Flooring); IMM EL16-33/EL16-34 Comments; Motion to Intervene and Comments in Support of the Northwest Ohio Aggregation Council, Lucas County, the City of Toledo, the City of Perrysburg, the City of Sylvania, the City of Maumee, the Village of Waterville, the Village of Holland, the Village of Ottawa Hills, the City of Northwood and Lake Township, Docket No. EL16-34-000 (filed Feb. 16, 2016); Letter from Rachael Belz to Kimberly D. Bose, Docket No. EL16-33-000 (filed Feb. 23, 2016) (comments of Ohio Citizen Action); Letter from Rachael Belz to Kimberly D. Bose, Docket No. EL16-34-000 (filed Feb. 23, 2016) (comments of Ohio Citizen Action); Motion to Intervene and Comments in Support of the Ohio Consumers’ Counsel, Docket No. EL16-33-000 (filed Jan. 27, 2016); Motion to Intervene and Comments in Support of the Ohio Consumers’ Counsel, Docket No. EL16-34-000 (filed Jan. 27, 2016); Motion to Intervene and Comments in Support Submitted on Behalf of the Ohio Manufacturers’

the Affiliate PPAs “could impact significantly PJM’s administration of the wholesale markets”⁵⁹ and urged the Commission to grant the Affiliate Waiver Complaints in order to ensure that it has an “opportunity to consider the potential effects of the Affiliate PPA[s] may have on the wholesale market competitiveness.”⁶⁰ The IMM expressed similar concerns that the Affiliate PPAs would “interfere[] with the efficient operation of wholesale markets in the PJM region,”⁶¹ and argued that the “waiver[s] should be revoked”⁶² Consistent with the Commission’s past observations that that “the actions of one state in a multi-state RTO like PJM can have a significant impact on wholesale prices affecting loads in other states,”⁶³ the Pennsylvania Public Utility Commission (the “Pennsylvania PUC”) was among the numerous other parties arguing that the Affiliate PPAs “may be enormously detrimental to organized wholesale markets.”⁶⁴

Association Energy Group, Docket No. EL16-33-000 (filed Feb. 23, 2016); Motion to Intervene and Comments in Support Submitted on Behalf of the Ohio Manufacturers’ Association Energy Group, Docket No. EL16-34-000 (filed Feb. 23, 2016); Comments of Oregon Clean Energy, LLC and the Talen PJM Companies in Support of the Complaint, Docket No. EL16-33-000 (filed Feb. 23, 2016); Comments of Oregon Clean Energy, LLC and the Talen PJM Companies in Support of the Complaint, Docket No. EL16-34-000 (filed Feb. 23, 2016); Comments on the Pennsylvania Public Utility Commission, Docket No. EL16-33-000 (filed Feb. 23, 2016) (“PaPUC EL16-33 Comments”); Comments on the Pennsylvania Public Utility Commission, Docket No. EL16-34-000 (filed Feb. 23, 2016) (“PaPUC EL16-34 Comments”); PJM EL16-33 Comments; PJM EL16-34 Comments; Supporting Comments of the PJM Power Providers Group, Docket No. EL16-33-000 (filed Feb. 23, 2016); Supporting Comments of the PJM Power Providers Group, Docket No. EL16-34-000 (filed Feb. 23, 2016); Comments of the Sierra Club in Support of the Complaint of EPSA et al., Docket No. EL16-34-000 (filed Feb. 23, 2016).

⁵⁹ PJM EL16-33 Comments at 3; PJM EL16-34 Comments at 3.

⁶⁰ PJM EL16-33 Comments at 2; PJM EL16-34 Comments at 2.

⁶¹ IMM EL16-33/EL16-34 Comments at 3.

⁶² *Id.*

⁶³ May 2013 Order, 143 FERC ¶ 61,090 at P 58 (footnote omitted).

⁶⁴ PaPUC EL16-33 Comments at 10; PaPUC EL16-34 Comments at 9.

IV.

COMPLAINT

At this time, the only resources subject to mitigation under the MOPR are certain new resources, namely, MOPR Screened Generation Resources.⁶⁵ With AEP and FirstEnergy poised to dump over 6 GW of subsidized existing resources into the 2019/2020 BRA, the absence of any mitigation regime for subsidized existing resources renders the Tariff unjust, unreasonable and unduly discriminatory. Indeed, PJM, the IMM, and a wide variety of other parties have recognized that the proposed AEP and FE Affiliate PPAs and Riders pose an imminent threat to the RPM market against which the existing MOPR rules provide no protection. It is vital, therefore, that the Commission recognize that what was once “only a theoretical weakness in the MOPR rules” is now a very real threat that demands immediate action to protect the RPM market,⁶⁶ and that it act expeditiously to protect the market from that threat.

A. Out-Of-Market Arrangements Like The Proposed Affiliate PPAs And Riders Give Existing Resources The Incentive And Ability To Submit Below-Cost Offers That Will Result In Artificial Price Suppression

Mr. Cavicchi explains that PJM’s capacity market “provides ‘incentives that are designed to stimulate investment both in maintaining existing generation and in encouraging the development of new sources of capacity.’”⁶⁷ In this market, “a competitive offer would reflect the incremental, going-forward cost that the supplier would incur if its offer is accepted and its resource takes on a capacity obligation.”⁶⁸ Accordingly, the RPM auctions are supposed to

⁶⁵ See Tariff, § 5.14(h)(1).

⁶⁶ April 2011 Order, 135 FERC ¶ 61,022 at P 139.

⁶⁷ Cavicchi Affidavit, ¶ 33 (citation omitted).

⁶⁸ November 2011 Order, 137 FERC ¶ 61,145 at P 132. See also, e.g., *ISO New England, Inc.*, 135 FERC ¶ 61,029 at P 176 (2011) (agreeing that “a competitive offer in a single-clearing-price auction would reflect the incremental costs of the supplier”), *on reh’g*, 138 FERC ¶ 61,027 (2012); *id.* at P 179

produce clearing prices that “signal the market’s expectations of the going-forward cost to keep and/or bring capacity into operation and avoid shutdown.”⁶⁹

This design is undermined when a buyer (or an entity acting on behalf of buyer-side interests) “invests in capacity and then offers that capacity into the auction at a reduced price.”⁷⁰ In the past, the Commission has focused primarily on the threat of subsidized new entry. Importantly, however, subsidies will have a deleterious effect on the market regardless of whether they are directed to new capacity or existing capacity. In fact, because PJM’s auction clearing mechanism does not distinguish between offers from new and existing resources, and simply clears such offers on a least-cost basis, there is no practical difference between the price suppression that will result from below-cost offers for new resources and that which will result from below-cost offers for existing resources. Regardless of whether below-cost offers are submitted by new or existing resources, such offers can “have the unintended effect of depressing the market clearing prices in [organized] markets, thus adversely affecting other market participants.”⁷¹

That is precisely the case with the proposed Affiliate PPAs, which will give AEP Ohio and the FE Utilities both the incentive and the ability to submit below-cost offers that improperly suppress prices. First, AEP Ohio and the FE Ohio Utilities will have strong incentives to submit below-cost offers in the RPM Auctions in order to ensure that they are able to recover the full net costs of the Affiliate PPAs pursuant to the Riders. In particular, AEP Ohio’s and the FE Ohio

(stating that “a competitive supplier would offer into the capacity market after it is constructed at its going-forward costs); *PJM Interconnection, L.L.C.*, 122 FERC ¶ 61,264 at P 56 (2008) (“A competitive seller of capacity is expected to bid its going-forward costs, i.e., the fixed annual operating expenses that would not be incurred if a unit were not a capacity resource for a year.”).

⁶⁹ Cavicchi Affidavit, ¶ 33.

⁷⁰ May 2013 Order, 143 FERC ¶ 61,090 at P 20.

⁷¹ *California Indep. Sys. Operator Corp.*, 142 FERC ¶ 61,191 at P 28 (2013).

Utilities' ability to recover costs of the Affiliate PPAs will be dependent upon their ability to demonstrate to the PUCO's satisfaction that their actions "when selling the output from generation units included in the [Riders] into the PJM market were not unreasonable."⁷² If, as one would expect, reasonableness will be assessed in light of whether a given action can be expected to minimize the costs borne by retail customers, it would make sense for AEP Ohio and the FE Ohio Utilities to submit "price-taker" offers that will maximize their capacity revenues and the offset to costs incurred under the Affiliate PPAs and thereby minimize net costs recovered through the Riders. In other words, as the IMM has explained:

The logical offer price for these resources in the PJM Capacity Market, under these conditions, would be zero. A zero offer would be rational because this would maximize the revenue offset to the customers who would be required to pay 100 percent of the costs of this capacity and bear all of the performance risks.⁷³

PJM similarly observes that the Affiliate PPAs and the Riders "turn[] market-based incentives on their head by encouraging below cost bidding in order for a unit owner to escape possible disallowance of retail revenues"⁷⁴ Mr. Cavicchi thus explains that AEP Ohio and the FE Utilities "can be expected to offer the capacity resources into the market at the lowest price possible to ensure that they are accepted by PJM in the capacity auction" in order to "maximize generating unit capacity revenues"⁷⁵

Second, with the assurance that AEP Ohio and the FE Ohio Utilities will recover the full net cost of the Affiliate PPAs provided their offers into the PJM markets are not unreasonable,

⁷² AEP Stipulation at 7; FE Third Stipulation at 7-8.

⁷³ IMM EL16-33/EL16-34 Comments, Attachment A, First Supplemental Testimony of Joseph E. Bowring on behalf of the Independent Market Monitor for PJM at 5 (the "Bowring AEP Supplemental Testimony"); *id.*, Attachment B, First Supplemental Testimony of Joseph E. Bowring on behalf of the Independent Market Monitor for PJM at 5 (the "Bowring FE Supplemental Testimony").

⁷⁴ PJM AEP Brief at 5; PJM FE Brief at 5.

⁷⁵ Cavicchi Affidavit, ¶ 35.

AEP and FirstEnergy will be indifferent to prices in the RPM Auctions. As the IMM states: “[t]he purpose of the [Riders] is to transfer the costs and market risks associated with the [PPA Units] from [AEP’s or FirstEnergy’s] shareholders to [their] ratepayers.”⁷⁶ In fact, both PJM and the IMM raised concerns before the PUCO that AEP Ohio and the FE Ohio Utilities would be allowed to use the Riders to recover even RPM penalties imposed on the PPA Units for their failure to comply with the performance requirements under PJM’s Capacity Performance construct, thereby undercutting the financial incentives that are designed to ensure that capacity resources are available when needed by PJM.⁷⁷ Mr. Cavicchi also explains that the Affiliate PPAs provide a “guaranteed recovery of all costs” that is akin to “traditional cost-of-service, rate-of-return regulation,” which will “create incentives for AEP [Generation] and [FE Solutions] to sustain inefficient operations”⁷⁸ For example, AEP Generation and FE Solutions can be expected to undertake “incremental capital investments in the PPA [Units] even when such investments would be uneconomic”⁷⁹ and similarly to have “no incentives to operate efficiently in real-time.”⁸⁰

Because the costs of the PPA Units will be covered by the Affiliate PPAs, “[t]he logical offer price for these resources in the PJM Capacity Market, under these conditions, would be zero,” as zero-price offers would “maximize the revenue offset to the customers who would be

⁷⁶ Bowring AEP Supplemental Testimony at 3; Bowring FE Supplemental Testimony at 3. *See also* PJM EL16-33 Comments at 5 (observing that the Riders would “requir[e] all retail customers to make up the difference between what these units might command in the market and their ultimate costs”); PJM EL16-34 Comments at 5 (same).

⁷⁷ *See* PJM AEP Brief at 8; PJM FE Brief at 8; IMM AEP Initial Brief at 5; IMM FE Initial Brief at 5.

⁷⁸ Cavicchi Affidavit, ¶ 46.

⁷⁹ *Id.*, ¶ 47.

⁸⁰ *Id.*, ¶ 48.

required to pay 100 percent of the costs of this capacity and bear all of the performance risks.”⁸¹ In this regard, the Affiliate PPAs are similar to the agreement reviewed in *Southern California Edison Co. on behalf of Mountainview Power Co., LLC*.⁸² In that case, the Commission recognized that the purchasing utility “could change market outcomes by bidding any energy or capacity from the . . . project into the California Independent System Operator’s market below its costs,” and that, “[b]ecause [the utility buyer] is assured full cost recovery of its cost from [the seller] it could benefit from this bidding strategy if it depresses a clearing price and it is a net buyer in that market.”⁸³

As Mr. Cavicchi explains, the Affiliate PPAs and similar arrangements that give existing resources the incentive and ability to submit below-cost offers will result in significant price suppression.⁸⁴ For example, as illustrated in Exhibit AJC-5, 2,000 MW of subsidized resources offering at \$0/MW-day will reduce the BRA clearing price from approximately \$140/MW-day to \$120/MW-day.⁸⁵ Using data from PJM, Mr. Cavicchi further states that the addition of 3,000 MW would result in a clearing price decrease of \$16.27/MW-day, which would translate

⁸¹ IMM AEP Initial Brief at 6; IMM FE Brief at 6.

⁸² 106 FERC ¶ 61,183 at P 63 (“*Mountainview I*”), *on reh’g*, 109 FERC ¶ 61,086 (2004) (“*Mountainview II*”), *on reh’g*, 110 FERC ¶ 61,319 (2005).

⁸³ *Mountainview I*, 106 FERC ¶ 61,183 at P 63 (footnote omitted). The Commission thus required utility buyer to submit energy offers for project based on its marginal cost in order to “prevent [it] from depressing the clearing price.” *Mountainview II*, 109 FERC ¶ 61,086 at P 43. *See also id.* at P 47 (the marginal cost bidding rule “eliminates [the buyer]’s ability to affect the spot market price through its bidding the [project] output into the spot market”).

⁸⁴ *See* Cavicchi Affidavit, ¶ 38. *See also* PJM AEP Brief at 5 (the Affiliate PPAs “incentivize these particular units to bid below their costs, which, in turn, would have a suppressing effect on prices and degrade the signal upon which PJM and Ohio are relying to attract new generation resources in Ohio”); PJM FE Brief at 5 (same); IMM AEP Initial Brief at 7 (“Offers at or near zero would have an anti-competitive, price suppressive effect on the PJM Capacity Market as would any offers at less than the competitive offer level.”); IMM FE Initial Brief at 7 (same).

⁸⁵ *See* Cavicchi Affidavit, ¶ 36.

into a staggering \$990 million reduction in overall capacity seller revenues.⁸⁶ And that is just in a single BRA. The impact of below-cost offers of the quantities over the terms of the AEP Affiliate PPA (over 2.6 GW for the remaining life of the units) and the FE Affiliate PPA (over 3.2 GW for eight years) is positively mind-boggling.

The harm to the RPM market could be even greater if, as AEP and FirstEnergy have at times implied, the resources covered by the Affiliate PPAs would retire but for the subsidies. In that scenario, the effect of the resulting uneconomic “non-exit” is indistinguishable from that of uneconomic entry, because the capacity would not be in the market at all without the out-of-market subsidies.⁸⁷ The Commission confronted this issue in a recent order involving the New York Independent System Operator, Inc.’s capacity market. In that case, the Commission denied a complaint requesting that resources that were required for reliability and that would have retired but for the cost support provided under Reliability Support Services Agreements (“RSSAs”) be subject to mitigation measures.⁸⁸ While the Commission denied the Complaint with respect to RSSAs “that procure adequate capacity to address short-term reliability needs,” it expressed concern regarding an agreement that “appears to procure more capacity than is needed for short-term reliability, and for a much longer term.”⁸⁹ In particular, the Commission recognized that below-cost offers by such additional capacity would mean that “capacity market prices could be artificially suppressed,” and “might deter new entry or displace less-costly

⁸⁶ *Id.*, ¶ 40.

⁸⁷ *Id.*, ¶ 27.

⁸⁸ *See Independent Power Producers of N.Y., Inc. v. New York Indep. Sys. Operator, Inc.*, 150 FERC ¶ 61,214 (2015) (“IPPNY”).

⁸⁹ *Id.* at P 69.

existing capacity”⁹⁰ That is exactly what will happen here if, as AEP and FirstEnergy have suggested, the PPA Units would retire without the subsidies provided under the Affiliate PPAs.

B. Artificial Price Suppression Undermines The RPM Market Design To The Detriment Of Other Suppliers And Consumers

Absent modifications to the RPM rules, the massive price suppression described by Mr. Cavicchi will not only harm other suppliers but also consumers throughout PJM. As the Commission has explained, capacity markets are designed to “provid[e] proper market signals for new entry and existing capacity.”⁹¹ Similarly, the IMM has observed that “[a] sustainable market design means a market design that results in appropriate incentives to retire units and to invest in new units over time such that reliability is ensured as a result of the functioning of the market.”⁹²

That market design is severely undermined when subsidies to certain favored resources are allowed to suppress clearing prices and thereby distort those incentives. The Commission has long recognized that “[a] capacity market will not be able to produce the needed investment to serve load and reliability if a subset of suppliers is allowed to bid noncompetitively to

⁹⁰ *Id.* Even assuming *arguendo* that it is appropriate to exempt resources required for short-term reliability from buyer-side market power mitigation measures, no such exemption would be applicable here with respect to the Affiliate PPAs because PJM has made clear that the units covered by those contracts are not required for reliability. *See* PJM AEP Brief at 11 (“arguments that approval of the Stipulation is needed to ensure reliability in Ohio are wide of the mark and represent a proverbial ‘red herring’”); PJM FE Brief at 11 (same). *See also* IMM AEP Reply Brief at 9 (“AEP cannot show that the PPA Units are needed for reliability.”). Moreover, as long-term contracts for the purchase of over 6 GW of capacity, the Affiliate PPAs can hardly be described as “procur[ing] adequate capacity to address [a] short-term reliability need[]” *IPPNY*, 150 FERC ¶ 61,214 at P 69.

⁹¹ *New York Indep. Sys. Operator, Inc.*, 124 FERC ¶ 61,301 at P 63 (2008), *on clarification, reh’g & compliance*, 131 FERC ¶ 61,170 (2010), *on reh’g*, 150 FERC ¶ 61,208 (2015). *See also, e.g., Maine PUC*, 520 F.3d at 473 (stating that capacity markets are intended to “ensure both that existing generators are adequately compensated and that prices support new entry when additional capacity is needed” (internal citations omitted)).

⁹² Bowring AEP Supplemental Testimony at 5; Bowring FE Supplemental Testimony at 5.

suppress market clearing prices.”⁹³ Similarly, Mr. Cavicchi explains that investment in new generation is dependent on confidence in PJM’s markets, and that “[t]o the extent that subsidization under the AEP and [FirstEnergy p]roposals supports continued operation of otherwise uneconomic resources, other new capacity resources will be squeezed out of the power markets.”⁹⁴ For that reason, PJM urged the PUCO to

make clear that a reasonable offer behavior for [AEP Ohio and the FE Ohio Utilities] would be to offer the units covered by the [Affiliate] PPA[s] into the PJM markets at a level no lower than their “actual costs,” as that term is understood by PJM and applied consistent with its Tariff and Manuals without consideration of the offsetting revenues provided by Ohio retail customers under the Stipulation[s]. Offering at actual costs ensures that the PPA[s] will not artificially suppress prices in a manner that could constrain development of new generation in Ohio.⁹⁵

AEP Ohio and the FE Ohio Utilities, however, have vigorously opposed PJM’s proposal on jurisdictional and other grounds.⁹⁶

Artificial price suppression not only deters new entry, but could result in the untimely retirement of otherwise economic existing resources. In particular, Mr. Cavicchi explains that agreements like the Affiliate PPAs will provide a subsidy that “lowers the amount of revenue [an] inefficient generator requires to avoid shutdown,” thereby causing the generator to submit offers that are “lower (likely zero or near zero),” which “results in a lower market clearing

⁹³ April 2011 Order, 135 FERC ¶ 61,022 at P 16.

⁹⁴ Cavicchi Affidavit, ¶ 9.

⁹⁵ PJM AEP Brief at 4-5 (footnote omitted); PJM FE Brief at 5 (footnote omitted). *See also, e.g.*, PaPUC EL16-33 Comments at 11 (the “affiliate PPA potentially poses a serious threat to the continued functioning of that market and its role in yielding efficient market clearing prices”); PaPUC EL16-34 Comments at 10 (same).

⁹⁶ *See* Reply Brief in Support of the Joint Stipulation and Recommendation on Behalf of Ohio Power Company at 91-93, PUCO Case Nos. Case No. 14-1693-EL-RDR (filed Feb. 8, 2016), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B08B65018J01371>; Post-Hearing Reply Brief of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company at 118-20, PUCO Case No. 14-1297-EL-SSO (filed Feb. 26, 2016), <http://dis.puc.state.oh.us/ViewImage.aspx?CMID=A1001001A16B26B63218C05269>.

price.”⁹⁷ This lower clearing price, in turn, “crowds out generators whose net-going forward cost is between the inefficient generator[’s] subsidized and unsubsidized capacity offers,” meaning that “less costly generating units would be crowded out by the inefficient, subsidized generating units.”⁹⁸ As the IMM put it, the price suppressive effects of the Affiliate PPAs will thus “make it difficult or impossible for generating units without subsidies to compete in the market.”⁹⁹

This could create a vicious cycle, whereby “if the [Affiliate PPAs] are allowed to distort PJM’s wholesale power markets, it could create incentives for additional subsidization,”¹⁰⁰ and result in “a slippery slope towards additional subsidies for generation now operating in competitive markets.”¹⁰¹ This is because artificially suppressed clearing prices resulting from out-of-market subsidies will mean that existing resources could be forced to seek out similar out-of-market cost support in order to survive. It is for precisely that reason that the Commission has discouraged the use of out-of-market contracts and other mechanisms that distort price signals, recognizing that they “undermine[] effective market performance” and result in “suppressed market clearing prices [that] further erode the ability of other generators to earn competitive revenues in the market and increase the likelihood that additional units will also require [out-of-market] agreements to remain profitable.”¹⁰² There is evidence that the market has already

⁹⁷ Cavicchi Affidavit, ¶ 37.

⁹⁸ *Id.* See also *id.*, Exh. AJC-5.

⁹⁹ Bowring AEP Supplemental Testimony at 5; Bowring FE Supplemental Testimony at 5.

¹⁰⁰ Cavicchi Affidavit, ¶ 10.

¹⁰¹ *Id.*, ¶ 50.

¹⁰² *Devon Power, LLC*, 103 FERC ¶ 61,082 at P 29, *on reh’g*, 104 FERC ¶ 61,123 (2003). See also, e.g., *California Indep. Sys. Operator Corp.*, 142 FERC ¶ 61,248 at P 64 (2013) (rejecting proposal for an “out-of-market solution that provides payments to resources that may be uneconomic” as such an approach would be “inconsistent with and undermines the need for forward price signals”); *Bridgeport Energy, LLC*, 118 FERC ¶ 61,243 at P 41 (2007) (emphasizing that reliability must-run agreements should be used only as a “last resort” because they “suppress market-clearing prices and deter investment in new generation” (citation omitted)).

started its slide down the slippery slope, with the Dayton Power and Light Company (“DP&L”) having recently filed an application with the PUCO requesting approval to enter into a PPA to support over 2 GW of generation after it is divested to an “unregulated” affiliate.¹⁰³ Mr. Cavicchi thus cautions that “[u]ltimately, this scenario could slide slowly toward a return to traditional rate of return regulation where generation investments are controlled by a regulatory approval process rather than being driven by market forces,”¹⁰⁴ which would “undermine the Commission’s reliance on competitive wholesale power markets to guide market participant decision making.”¹⁰⁵

At the end of the day, artificial price suppression that undermines the RPM design benefits no one. As Mr. Cavicchi states, “shifting capacity payments from efficient producers to the less efficient [subsidized resources] will crowd out new, efficient investment and may lead to the exit of existing generation that is more economic than the generation under the PPAs.”¹⁰⁶ Over the longer-term, this will have adverse consequences not just for potential investors and existing suppliers but also for consumers, as “the total cost[] of energy supply will be higher . . . than it would have been in the absence of the subsidy, all else being equal.”¹⁰⁷ These effects will not be limited to Ohio, but will inevitably impact consumers throughout the multi-state PJM market. As the Commission has recognized and as illustrated by the fact that the Pennsylvania PUC has taken the unusual step of filing in support of the Affiliate Waiver Complaints, “without effective mitigation of state-sponsored uneconomic [resources], the actions of a single state could

¹⁰³ See Application of the Dayton Power and Light Company for Approval of its Electric Security Plan at 1, PUCO Case Nos. 16-0395-EL-SSO, *et al.* (filed Feb. 22, 2016) (“DP&L Application”), <http://dis.puc.state.oh.us/TiffToPdf/A1001001A16B22B33152F03093.pdf>.

¹⁰⁴ Cavicchi Affidavit, ¶ 50.

¹⁰⁵ *Id.*, ¶ 11.

¹⁰⁶ *Id.*, ¶ 49.

¹⁰⁷ *Id.*

have the effect of preventing other states from participating in wholesale markets.”¹⁰⁸ Accordingly, the Commission has properly found in the past that it is “statutorily mandated” to protect the RPM market from the effects of such resources,¹⁰⁹ and it must take similar action here with respect to state-subsidized existing resources.

V.

REQUESTED RELIEF

As discussed above and in the Cavicchi Affidavit, the existing MOPR is unjust, unreasonable and unduly discriminatory because it allows price suppression through below-cost offers by existing resources receiving out-of-market cost support. In fact, in his testimony before the PUCO, Dr. Bowring expressly stated that the AEP and FirstEnergy proposals “highlight the fact that the MOPR needs to be expanded to address all cases where subsidies create an incentive to offer capacity into the PJM Capacity Market at less than an unsubsidized, competitive offer. This would include offers from all new and existing units that receive subsidies.”¹¹⁰ This testimony reflected the IMM’s longstanding concern that below-cost offers from existing resources are a “threat to the ability of a performance-based capacity market design to operate as intended that should be addressed.”¹¹¹ As discussed below, it is vital that the Commission act expeditiously to ensure that just and reasonable measures are in place in time for the 2019/2020

¹⁰⁸ April 2011 Order, 135 FERC ¶ 61,022 at P 143.

¹⁰⁹ *Id.* See also November 2011 Order, 137 FERC ¶ 61,145 at P 3 (“We are forced to act, however, when subsidized entry supported by one state’s or locality’s policies has the effect of disrupting the competitive price signals that PJM’s RPM is designed to produce, and that PJM as a whole, including other states, rely on to attract sufficient capacity.”); *id.* at P 64 (stating that regardless of the intent underlying a particular state’s initiatives, “other states may not agree with these objectives and may not be willing to bear the costs of uneconomic entry or to have such entry undermine competitive markets for those states that prefer to rely on private capacity for generation construction” (citation omitted)).

¹¹⁰ Bowring AEP Supplemental Testimony at 6; Bowring FE Supplemental Testimony at 6.

¹¹¹ Comments of the Independent Market Monitor for PJM at 5, Docket Nos. ER15-623-000, *et al.* (filed Jan. 21, 2015).

BRA. Even if the immediate threat to the 2019/2020 BRA can be averted through means other than expansion of the MOPR, the Commission should make clear that the existing MOPR is unjust and unreasonable because it fails to address price suppression by subsidized existing resources, and direct PJM to initiate a stakeholder process to address this issue going forward, with an obligation to file revised Tariff provisions by November 1, 2016.

A. The MOPR Should Be Expanded In Time For The 2019/2020 BRA, Regardless Of The Disposition Of The Affiliate Waiver Complaints

Regardless of the disposition of the Affiliate Waiver Complaints, the Commission should require modifications to the Tariff to mitigate the harm to the RPM market from subsidized existing resources, including the immediate threat to the 2019/2020 BRA posed by the AEP and FirstEnergy subsidies. Specifically, PJM should be directed to add the following proposed new subsection (i) to Section 5.14 of Attachment DD, to address this fundamental flaw:

(i) Minimum Offer Price Rule for Certain Existing Generation Capacity Resources

(1) General Rule. Any Sell Offer submitted in any RPM Auction for any Delivery Year based on an Existing MOPR Screened Generation Resource shall have an offer price no lower than the Existing Resource MOPR Floor Offer Price.

(2) Applicability. An Existing MOPR Screened Generation Resource shall be an Existing Generation Capacity Resource other than an Intermittent Resource that receives revenues outside the PJM markets under an EMSGR Contract. An “EMSGR Contract” is any contract (i) having a term of one year or more; (ii) entered into on or after January 1, 2016; and (iii) under which the purchaser is an entity other than (A) a Vertically Integrated Utility making purchases consistent with its most recent integrated resource plan found reasonable by the RERRA to meet the needs of its customers, (B) a Public Power Entity making purchases traditionally associated with procurement activities of Public Power Entities (or joint action of multiple Public Power Entities), or (C) a Single Customer Entity making purchases consistent with its longstanding business model. A Capacity Market Seller may only submit a Sell Offer below the Existing

Resource MOPR Floor Offer Price based on an Existing MOPR Screened Generation Resource if it has first submitted a notarized certification of a duly authorized officer to the Office of Interconnection and the Market Monitoring Unit affirming that one or both of the following conditions is met: (x) none of the costs of the EMSGR Contract are directly or indirectly recoverable from retail customers as a result of a regulatory approval; or (y) the EMSGR Contract was awarded through an arm's-length, non-discriminatory, open and competitive process. The notarized certification shall also include a certification that the officer has personal knowledge of, or has engaged in a diligent inquiry to determine, the facts and circumstances relevant to such conditions. A certification based solely on a claim that a given contract was the product of an open and competitive process for purposes of Section 5.14(i)(2)(ii) shall not be effective unless and until accepted by the Office of Interconnection and the Market Monitoring Unit; provided, however, that the Capacity Market Seller shall have the right to appeal to FERC if its certification is not accepted by either the Office of Interconnection or the Market Monitoring Unit within 10 days.

(3) Existing Resource MOPR Floor Offer Price.

The Existing Resource MOPR Floor Offer Price, stated in dollars per MW/day of unforced capacity, shall be the product of the Net Cost of New Entry applicable for the Delivery Year and Locational Deliverability Area in which the Existing MOPR Screened Generation Resource is located times the average of the Balancing Ratios in the three consecutive calendar years (during the Performance Assessment Hours in such calendar years) that precede the Base Residual Auction for such Delivery Year. Notwithstanding the previous sentence, a Capacity Market Seller may obtain a unit-specific Existing Resource MOPR Floor Offer Price that is lower than the Existing Resource MOPR Floor Offer Price permitted under the prior sentence, if the Capacity Market Seller submits documentation and data demonstrating, and obtains a determination from the Market Monitoring Unit and the Office of the Interconnection, or from the Commission, prior to the RPM Auction in which it seeks to submit the Sell Offer, that such Sell Offer is consistent with Section 5.14(i)(3)(i), in the case of a Sell Offer for a Capacity Performance Resource, or Section 5.14(i)(3)(ii), in the case of a Sell Offer for a Base Capacity Resource.

i) The unit-specific Existing Resource Floor Offer for a Capacity Performance Resource shall be determined consistent with the following formula:

$$\text{Net ACR} + ((\text{Net CONE}/30) * H * (B-A))/365$$

Where:

Net ACR = Avoidable Cost Rate for such resource, less the Projected PJM Market Revenues for such resource, stated in dollars per MW/day of unforced capacity;

Net CONE = the net Cost of New Entry (stated in \$/MW year of unforced capacity) for the CONE Area in which the Existing MOPR Screened Generation Capacity Resource is located;

H = the expected number of Performance Assessment Hours;

B = the average of the Balancing Ratios in the three consecutive calendar years (during the Performance Assessment Hours in such calendar years); and

A = the average availability of the capacity resource in the three consecutive calendar years (during the Performance Assessment Hours in such calendar years).

ii) The unit-specific Existing Resource Floor Offer for a Base Capacity Resource shall be equal to the Avoidable Cost Rate for such resource, less the Projected PJM Market Revenues for such resource, stated in dollars per MW/day of unforced capacity.

In the interest of proposing something that can be put in place in time for the 2019/2020 BRA, Complainants have deliberately proposed mitigation that is narrowly tailored to the immediate threat to the 2019/2020 BRA. For example, proposed Section 5.14(i)(2) includes conditions that will exclude resources that would be eligible for exemption from the MOPR under Section 5.14(h)(6) (Self-Supply Exemption) or Section 5.14(h)(7) (Competitive Entry Exemption) if they were new. Similarly, proposed Section 5.14(i)(2) would exclude Intermittent Resources, which likewise would not be subject to the existing MOPR if they were new, and would further exclude resources receiving subsidies under contracts entered into before January 1, 2016.

Similarly, in order to ensure that mitigation may be in place for the 2019/2020 BRA, Complainants have proposed an Existing Resource MOPR Floor Offer Price that is consistent with the principles articulated by the IMM with respect to PJM's Capacity Performance proposal¹¹² and accepted by the Commission.¹¹³ Mr. Cavicchi provides a detailed explanation for economic rationales underlying the proposed Existing Resource MOPR Floor Offer Price in his affidavit.¹¹⁴ Fundamentally, this proposal is intended to ensure that offers reflect "the expected costs and benefits of taking on a capacity market supply obligation,"¹¹⁵ and that Capacity Market Sellers are permitted to obtain PJM's and the IMM's approval to submit lower offers based on specific expectations regarding their resources.

Complainants acknowledge that this proposal, while just and reasonable, may not be appropriate as a permanent remedy for the problem of subsidized existing resources. Moreover, some of the exclusions from the coverage of the revised MOPR, which make sense given the imminent threat to the 2019/2020 BRA, may be overly broad over the longer term. Accordingly, and consistent with Commission precedent approving tariff provisions that are only intended to remain in place until longer-term solutions may be put in place,¹¹⁶ the MOPR modifications proposed by Complainants herein are intended only as an interim, narrowly-tailored solution that may be immediately adopted to prevent below-cost offers by existing resources from distorting clearing prices in the rapidly approaching 2019/2020 BRA.

¹¹² See Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM, Docket Nos. ER15-623-000, *et al.* (filed Feb. 25, 2015) (errata filed Feb. 27, 2015).

¹¹³ See *PJM Interconnection, L.L.C.*, 151 FERC ¶ 61,208 at PP 335-36, *on reh'g*, 152 FERC ¶ 61,064 (2015).

¹¹⁴ See Cavicchi Affidavit, ¶¶ 51-75.

¹¹⁵ *Id.*, ¶ 54.

¹¹⁶ See, e.g., *Midwest Indep. Transmission Sys. Operator, Inc.*, 131 FERC ¶ 61,057 at P 19 (2010); *Midwest Indep. Transmission Sys. Operator, Inc.*, 129 FERC ¶ 61,060 at P 2 (2009), *on reh'g*, 154 FERC ¶ 61,073 (2015); *California Indep. Sys. Operator Corp.*, 128 FERC ¶ 61,282 at P 32 (2009).

It is foreseeable that certain parties may object that the MOPR should not be revised at all without the proposed modifications having first been vetted through the stakeholder process. While Complainants fully support a stakeholder process to address long-term solutions to the problem, the absence of a stakeholder process provides no justification for tolerating unjust and unreasonable rates in the meantime, particularly when the potential price suppression is on the order of a billion dollars in the 2019/2020 BRA alone. To the contrary, there is nothing in the FPA that even remotely suggests that the absence of a stakeholder process renders unjust and unreasonable rates lawful, even on a temporary basis.¹¹⁷

To the extent that the Commission agrees that the existing MOPR is unjust and unreasonable by virtue of failing to address the problem of artificial price suppression by existing resources, it is obligated under Section 206 to “determine the just and reasonable rate . . . to be thereafter observed and in force, and shall fix the same by order.”¹¹⁸ Accordingly, even if it does not find Complainants’ proposed MOPR modifications to be just and reasonable, the Commission must devise its own remedy to ensure that existing resources that receive out-of-market price support are not permitted to artificially suppress RPM clearing prices.¹¹⁹

¹¹⁷ Cf. *Consumer Fed’n of Am. v. FPC*, 515 F.2d 347, 358 n.64 (D.C. Cir. 1975) (holding that “not even ‘a little unlawfulness is permitted’” in Commission-jurisdictional rates).

¹¹⁸ 16 U.S.C. § 824e(a) (2012).

¹¹⁹ See, e.g., *Maryland Pub. Serv. Comm’n v. FERC*, 632 F.3d 1283, 1285 n.1 (D.C. Cir. 2001) (rejecting argument that “a challenge to rates must propose alternative rates that are just and reasonable” because “[i]t is the Commission’s job – not the petitioner’s – to find a just and reasonable rate”); *Tennessee Gas Pipeline Co. v. FERC*, 860 F.2d 446, 454 (D.C. Cir. 1988) (once the Commission finds an existing rate to be unjust and unreasonable, “the Commission is required to reach a further determination: the just and reasonable rate to be fixed in place of either an unlawful proposed or existing rate”); *New England Power Generators Ass’n v. ISO New England Inc.*, 153 FERC ¶ 61,222 at P 35 (2015) (in cases where a rate has been shown to be unjust and reasonable, “the Commission would then have determined a just and reasonable replacement rate, whether by accepting [the complainant’s] proposal, if supported by record evidence, or implementing its own solution”); *PJM Interconnection, L.L.C.*, 142 FERC ¶ 61,216 at P 94 (2013) (“And where the Commission finds that a rate is unreasonable, as it has in this proceeding, we have an obligation to fix the just and reasonable rate under section 206 of the FPA.”).

B. Regardless Of The Status Of The AEP And FirstEnergy Proposals, PJM Should Be Directed To Initiate A Stakeholder Process

Even if the AEP and FirstEnergy proposals are addressed through other means and the RPM market is able to dodge the subsidized existing resource bullet this time, there is no reason to assume that it will do so next time. And there is every reason to expect that the next time is, at most, a BRA away. For example, DP&L has a proposal similar to the AEP and FirstEnergy proposals pending before the PUCO that, if approved, would be in place in time for the BRA for 2020/2021 Delivery Year (the “2020/2021 BRA”).¹²⁰ For this reason, the Commission should direct PJM to initiate a stakeholder process to develop modifications to the MOPR that will address the threat posed by subsidized resources over the long term. Such a process is necessary and appropriate regardless of whether the Commission orders the interim relief requested in Section V.A and regardless of whether the AEP and FirstEnergy proposals remain intact. In order to ensure that more permanent measures are in place in time for the 2020/2021 BRA, the Commission should require that PJM make a Tariff filing no later than November 1, 2016, regardless of the status of the AEP and FirstEnergy proposals and regardless of whether the Commission has granted relief in time for the 2019/2020 BRA.

VI.

REQUEST FOR FAST TRACK PROCESSING

The issues raised in this Complaint warrant fast track processing under Rule 206(b)(11) of the Commission’s Rules of Practice and Procedure.¹²¹ As discussed above, Complainants fully support the initiation of a PJM stakeholder process to consider broader revisions to the MOPR to address the threat to the RPM market posed by subsidized existing resources. That

¹²⁰ See DP&L Application at 1 (proposing a non-bypassable charge like the Riders with a term of January 1, 2017 through December 31, 2026).

¹²¹ 18 C.F.R. § 385.206(b)(11) (2015).

said, there is plainly insufficient time to complete such a stakeholder process and the Commission review that would follow in time to address the imminent threat to the 2019/2020 BRA posed by the State-mandated subsidies for over 6 GW of generation covered by the Affiliate PPAs and to prevent the unjust and unreasonable prices that will result if this capacity is dumped into the 2019/2020 BRA at below-cost prices. Accordingly, it is imperative that the Commission process this Complaint on a fast track basis and issue an order on or before May 1, 2016 requiring the Tariff modifications described above, or such other modifications as the Commission deems appropriate.

VII.

OTHER MATTERS

A. Other Proceedings

Pursuant to Rule 206(b)(6) of the Commission's Rules of Practice and Procedure,¹²² Complainants state that the issues presented in this Complaint are not pending before the Commission in any other proceeding. This Complaint seeks to address flaws in the existing MOPR, which fails to address price-suppressive offers by existing generation resources, and is therefore distinct from the Affiliate Waiver Complaints, which, as discussed above, seek rescission of waivers of the affiliate power sales restrictions previously granted to subsidiaries of AEP and FirstEnergy. Complainants note that the Ohio Office of Consumers' Counsel has raised issues similar to those raised in the Affiliate Waiver Complaints in Docket No. ER16-323-000, a proceeding in which OVEC is seeking authorization to sell electric energy, capacity and ancillary services at market-based rates.¹²³

¹²² 18 C.F.R. § 385.206(b)(6) (2015).

¹²³ See, e.g., Motion to Intervene, Protest and Request for Evidentiary Hearings of the Office of the Ohio Consumers' Counsel, Docket No. ER16-323-000 (filed Dec. 4, 2015). OVEC has taken the position

B. Negotiations Among The Parties

Complainants have discussed their concerns regarding the Affiliate PPAs with PJM and the IMM, and based on PJM's and the IMM's filings before the PUCO and in the EL16-33 and EL16-34 Proceedings, it is Complainants' understanding that PJM and IMM share certain of Complainants' concerns regarding the impact of the Affiliate PPAs on RPM auctions. Nonetheless, because the existing Tariff does not provide for the mitigation of offers by existing resources, Complainants do not believe that further discussions between the parties will resolve the concerns that have prompted this Complaint in time for the 2019/2020 BRA.

In accordance with Rule 206(b)(9) of the Commission's Rules of Practice and Procedure,¹²⁴ Complainants state that they have not contacted the Commission's Office of Enforcement before filing this Complaint. This Complaint involves questions regarding the justness and reasonableness of the Tariff. As such, it does not appear well suited to resolution by the Office of Enforcement.

C. Financial Impact

As Mr. Cavicchi explains, the Affiliate PPAs and similar arrangements will have a profound impact on prices in the RPM BRAs. For example, if the subsidies being provided to over 6 GW of generation were to result in an additional 3 GW of capacity clearing in the 2019/2020 BRA, it could result in \$990 million in price suppression in just a single BRA.¹²⁵

that such issues are beyond the scope of that proceeding. *See* Motion for Leave to Answer and Answer of Ohio Valley Electric Corporation, Docket No. ER16-323-000 (filed Dec. 18, 2015); Motion for Leave to Answer and Answer of Ohio Valley Electric Corporation, Docket No. ER16-323-000 (filed Dec. 23, 2015).

¹²⁴ 18 C.F.R. § 385.206(b)(9) (2015).

¹²⁵ *See* Cavicchi Affidavit, ¶ 40.

D. Service and Form of Notice

In accordance with Rule 206(c) of the Commission's Rules of Practice and Procedure,¹²⁶ Complainants are serving a copy of this Complaint on the respondent, PJM.

In accordance with Rule 206(b)(10) of the Commission's Rules of Practice and Procedure,¹²⁷ a form of notice suitable for publication in the *Federal Register* is provided in Attachment B.

¹²⁶ 18 C.F.R. § 385.206(c) (2015).

¹²⁷ 18 C.F.R. § 385.206(b)(10) (2015).

VIII.

CONCLUSION

WHEREFORE, for the foregoing reasons, Complainants respectfully request that the Commission issue an order granting this Complaint and ordering the relief requested herein.

Respectfully submitted,

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Energy, LLC**

Dated: March 21, 2016

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document on the respondent,
PJM Interconnection, L.L.C.

Dated at Washington DC, this 21st day of March, 2016.

/s/ Stephanie S. Lim

Stephanie S. Lim

Attachment A
Cavicchi Affidavit

3. I have been asked by counsel for Calpine Corporation, Dynegy Inc., Eastern Generation, LLC, Homer City Generation, L.P., NRG Power Marketing LLC, and GenOn Energy Management, LLC (together with the other complainants identified in the complaint, “Complainants”) to provide an analysis of the expected economic impact on the PJM Interconnection LLC’s wholesale power markets of two long-term affiliate Power Purchase Agreements (“PPAs”) proposed by, and between, Ohio utilities’ American Electric Power’s (“AEP”) and FirstEnergy’s (“FE”) subsidiaries. My analysis supports the contemporaneous filing by Complainants of a complaint under the Federal Power Act asserting that these proposed PPAs will artificially suppress PJM wholesale market prices, and in particular, in PJM’s Reliability Pricing Model (“RPM”) capacity market’s prices.
4. Complainants’ complaint arises in response to the recent actions of AEP’s and FE’s state-regulated utilities in Ohio which have proposed long-term, anti-competitive,

inter-affiliate power purchase and sale agreements that transfer the control of over 6,000 MW of potentially uneconomic electric generating capacity from AEP and FE generation affiliates to AEP's and FE's state-regulated utilities in Ohio. In association with the transfer in control of these electric generation resources, AEP's and FE's state-regulated utilities in Ohio would assume the financial risks of these generating units' operations and would pass those risks through to AEP's and FE's state-regulated utilities' captive ratepayers. These PPAs will distort competition among generation resources in PJM's wholesale markets and, all else equal, will suppress wholesale power market prices in the short run and increase consumer costs over the long run. While the PPAs themselves are anomalies in the industry when compared to any agreement that would result from a competitive procurement process run by a traditionally regulated load serving entity, they are also symptoms of what appears to be a growing threat to PJM's and other capacity markets: subsidization of existing resources which creates economic incentives to offer resources into the markets below competitive price levels and thereby threatens to distort market prices.

C. Summary of Conclusions

5. First, I find that the PPA Proposals shift the responsibility for managing the disposition of the generating units' capacity and production from AEP's and FE's generation subsidiaries which are focused on competing in competitive wholesale power markets to AEP's and FE's state-regulated utilities in Ohio, whose business is the transmission and distribution of electricity. Thus, AEP's and FE's state-regulated utilities in Ohio become in effect the *de facto* owners of the various generating units, albeit without direct control over future operation and investment decisions. Under the new contractual division of responsibility for business decisions and risks encapsulated in the proposed PPAs, the approach for offering the generation units' output into the wholesale power markets is expected to change when compared to the generating units being operated competitively. At the same time, AEP's and FE's Ohio state-regulated utilities' interests in the operation, maintenance, and longer-term capital investment in the generating units will not be aligned with those facing the FE and AEP generation subsidiaries which compete in the wholesale power markets.
6. Next, to make matters worse, the buyers under the PPAs—in this case the seller's affiliated state-regulated utility companies—also have no incentive to operate the participating generating units efficiently. The buyer has committed to a fixed payment for the capacity from the generating units, regardless of unit performance, and will logically seek to maximize market revenues from the generating units in order to offset the PPA payment obligations. Neither going forward costs to keep the units operational nor future investment costs will be “avoidable” by the buyer, as they will be passed through to them under the terms of the PPAs. As a consequence, the

buyer will be incentivized to clear all the generating unit capacity in PJM's capacity auctions to earn revenue to off-set avoidable cost. AEP's and FE's Ohio state-regulated utilities can be expected to offer the generating unit capacity into PJM's capacity market auctions at the lowest price possible to ensure the units are accepted in the auctions.

7. Third, market participant behavior such as that incentivized by the affiliate PPAs, unanticipated under PJM's current tariff, can be expected to distort market pricing away from competitive levels. Such behavior in this instance is the result of unexpected pressures applied by the AEP and FE subsidiaries within Ohio's state electric utility regulatory regime. In the absence of the proposed changes to PJM's market design presented herein, the burden of these PPAs will fall not only on Ohio captive retail ratepayers, but also on the PJM markets and other market participants as the PPAs will lead to uneconomic price signals, investment, and operating decisions throughout the PJM footprint.
8. Other PJM capacity market sellers will be subject to a substantial financial impact as even small changes in PJM capacity market prices translate into large reductions in revenues for sellers. For example, PJM estimates based on its most recent capacity market results that, all else equal, the addition of 3,000 MW of capacity market supply that would otherwise not be accepted in the auction would reduce the RTO price by \$16.27/MW-Day. This translates to a reduced value of all capacity that PJM reported cleared in the most recent auction of \$990 million. Other market sellers will likely see their capacity market revenues fall by hundreds of millions of dollars over the term of the PPAs.
9. At the same time consumers can be expected to face increased PJM wholesale market costs as a result of the PPAs. To the extent that subsidization under the AEP and FE PPA Proposals supports continued operation of otherwise uneconomic resources, other new capacity resources will be squeezed out of the power markets. As a new developer in Ohio with a plant currently under construction, Oregon Clean Energy, states: "Our investors' willingness to commit more than \$800 million to this Ohio-based project was predicated on their long-term confidence in PJM's markets. Oregon Clean Energy, LLC has the potential to develop an additional 860 MW facility in Ohio that can only go forward if this confidence is maintained."¹ Impeding the entry of new competitive generation resources through artificial subsidization of existing uneconomic resources will drive energy prices higher as new, high efficiency

¹ Oregon Clean Energy, Letter No. OCE-PJM-005 to the PJM Board of Managers, January 22, 2016, available at: <http://www.pjm.com/~media/about-pjm/who-we-are/public-disclosures/20160125-oregon-clean-energy-llc-letter-to-pjm-board-of-managers.ashx>

generation resources suspend development and are not brought to market. Over the longer term consumers pay higher power prices and the regional economy suffers.

10. Finally, if the AEP and FE PPA Proposals are allowed to distort PJM's wholesale power markets, it could create incentives for additional subsidization. For example, additional subsidization might be required for units needed for reliability to compensate for the lack of performance incentives for the subsidized units. Similarly, other states may decide to follow AEP's and FE's bad example and provide similar subsidies to potentially uneconomic generation in their states. And to the extent that such out of market payments expand, regulators will realize the need to monitor and evaluate the performance and cost-effectiveness of the subsidized generation. Ultimately, this scenario could slide slowly back towards reliance on traditional rate of return regulation where electric generation asset investments and operations are controlled by a regulatory approval process rather than being driven by market forces.
11. Such an outcome would undermine the Commission's reliance on competitive wholesale power markets to guide market participant decision making. The performance of PJM's wholesale power markets has proved that committing to a competitive market framework does result in measured decision making by market participants where uneconomic resources exit the market and new resources enter the market, without requiring out of market interventions such as the AEP and FE PPA Proposals. Allowing the AEP and FE PPA Proposals to distort PJM's wholesale power markets portends grave consequences.
12. To ensure PJM's capacity market continues to procure capacity efficiently, guarding against the impact of the AEP and FE PPA Proposals requires at a minimum a modification to the PJM RPM Minimum Offer Price Rule ("MOPR").² In particular, the proposal is to extend the applicability of the current MOPR to existing generation capacity that is inappropriately subsidized by non-market based PPAs or similar financial commitments so that under a very specific set of circumstances existing generating unit RPM auction offer prices will be subject to a MOPR floor price. Addition of an Existing Generation Capacity Resource MOPR ("EGCR MOPR") to PJM's RPM tariff will simply ensure that contractual arrangements like the PPAs cannot be used to subsidize otherwise uncompetitive generation resources, causing uneconomic price signals in the capacity market.
13. The proposed EGCR MOPR establishes an auction offer floor price based on the economic principles applicable to the development of competitive auction offers in PJM's RPM capacity auction market. The EGCR MOPR offer price floor is defined

² Although not specifically the subject of this complaint, subsidies to existing generators that would otherwise reduce or cease operations will also depress electric energy market prices as well.

as the product of the Net Cost of New Entry (“Net-CONE”) applicable for the delivery year and PJM Locational Deliverability Area (“LDA”) for which a MOPR screened EGCR is offered multiplied by the average of the Balancing Ratios in the three consecutive calendar years that precede the auction year.³ In addition, a capacity market seller may obtain a unit-specific EGCR MOPR Floor Offer Price that is lower than the defined EGCR MOPR Floor Offer Price, if the Capacity Market Seller submits documentation and data demonstrating that its actual costs of supplying capacity are lower.⁴ The EGCR MOPR Floor Offer Price will help prevent inappropriately subsidized generation capacity resource auction offers from distorting PJM’s RPM auction market prices.

14. To guard against the threat of anti-competitive, back-room affiliate deals that blatantly subsidize a subset of likely less competitive electric generation resources it is imperative that if these PPAs are approved PJM’s market design ensures that these assets are offered into the markets at competitive price levels. Absent action there will be little, if any, incentive for these subsidized existing generation capacity resources to be subject to optimized, market based operation and investment decisions. I recommend that the Commission adopt the proposed EGCR MOPR. I also agree that the Commission should direct PJM to initiate a stakeholder process to develop a longer-term fix to the problem of subsidies to uneconomic resources.

II. BACKGROUND

15. The Public Utilities Commission of Ohio (“PUCO”) is engaged in two ongoing state regulatory proceedings which each involve assessing whether or not it is in Ohioans’ public interest to allow AEP’s and FE’s utility subsidiaries to recover the costs of proposed affiliate PPAs from retail ratepayers, including those that have elected to purchase electricity from competitive suppliers.⁵ These proceedings were initiated in association with a PUCO proceeding associated with the evaluation of an Ohio Power Company (“AEP Ohio”) filing assessing a standard service offer power procurement plan for AEP Ohio’s customers.⁶ As part of PUCO Case No. 13-2385-EL-SSO, the PUCO determined that an Ohio utility could make applications to recover costs of a

³ The Balancing Ratio is a load to resource ratio defined by PJM that is expected to be equal to ~.85-.95.

⁴ The process for obtaining a unit-specific EGCR MOPR Floor Offer Price would be the same to that used now by PJM and PJM’s Independent Market Monitor (“IMM”) to evaluate alternative unit-specific offer cap requests.

⁵ See PUCO Case No. 14-1297-EL-SSO, In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan and Case No. 14-1693-EL-RDR, In the Matter of the Application Seeking Approval of Ohio Power Company’s Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider.

⁶ PUCO Case No. 13-2385-EL-SSO.

PPA through a non-bypassable charge assessed to all retail ratepayers.⁷ AEP Ohio and FE's three Ohio transmission and distribution utilities: Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company (the "FE Companies") have each made filings that request PUCO authorization to recover costs of proposed affiliate PPAs through such charges.⁸

16. FE's PPA proposal was first made public following 2014's so-called "polar vortex" of unusually cold weather,⁹ and the proposal was characterized as a measure to provide protection against possible power price increases over the longer term.¹⁰ Instead of soliciting the marketplace for competitive offers that could provide hedges against possible price increases, the FE Companies chose to enter into exclusive discussions with their generation affiliate, FirstEnergy Solutions ("FES"). This produced the terms and conditions of a 15-year cost-based agreement (later reduced to eight years as part of a December 2015 stipulation which contained various additional provisions)¹¹ that would have ratepayers support the recovery of and on historical and recent capital investments in two large FES generation assets: the 908 MW Davis Besse plant and the 2,220 MW Sammis plant.

17. AEP Ohio's pending proposal seeks to recover costs of an affiliate PPA through the PUCO's Feb. 25, 2015 Order. Although AEP Ohio's original PPA rider proposal was associated with its approximately 400 MW ownership share of the Ohio Valley Electric Corporation ("OVEC"), following the PUCO's Feb. 25, 2015 Order, AEP Ohio initiated a PUCO proceeding focused on a newly formulated PPA proposal that included an additional 2,700 MW of electric generating unit capacity.¹² Like the FE

⁷ On February 25, 2015, the Commission modified and approved an Electric Security Plan ("ESP") for Ohio Power Company d/b/a AEP Ohio (AEP Ohio), *In re Ohio Power Co.*, Case No. 13-2385-EL-SSO, et al., Opinion and Order ("Feb. 25, 2015 Order"). In this order the PUCO set out certain principles that it would consider in association with evaluating a unique utility request for the establishment of a power purchase agreement rider (e.g., key economic principles would be evaluating the financial needs of the generating plant under the PPA; the PPA plants' contribution to PJM's power supply mixture diversity; and the impact that a closure of the PPA generating plant would have on electric prices and the resulting effect on economic development within the state). As I explain, this type of rate "rider" would be specifically designed to pass through to all of a utility's captive ratepayers the costs and benefits of a power purchase agreement.

⁸ Id.

⁹ First Energy included its PPA proposal as part of its ESP filing on August 4, 2014 and made its first formal public mention of this potential affiliate agreement during its second earnings call in 2014. See FirstEnergy Corporation, Q2 2014 Earnings Conference Call, August 5, 2014, available at <http://seekingalpha.com/article/2385275-firstenergys-fe-ceo-anthony-alexander-on-q2-2014-results-earnings-call-transcript>.

¹⁰ See, for example, Fifth Supplemental Testimony of Eileen M. Mikkelsen on behalf of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company, Case No. 14-1297-EL-SSO, December 15, 2015 (hereinafter "Mikkelsen Fifth Supplemental Testimony").

¹¹ Before the Public Utilities Commission of Ohio, Case No. 14-1297-EL-SSO, December 1, 2015, Third Supplemental Stipulation and Recommendation (hereinafter "Third Stipulation").

¹² See Direct Testimony of Kelly D. Pearce in Support of AEP Ohio's Amended Application, Before the Public Utilities Commission of Ohio, *In the Matter of the Application Seeking Approval of Ohio Power Company's*

Companies, AEP Ohio also eventually filed a stipulation in its PPA proceeding that envisions an eight-year term PPA (as opposed to decades) and other various provisions.¹³

A. The Proposed AEP and FE PPAs

18. In its PUCO proceeding, AEP Ohio proposes to enter into an eight-year power purchase agreement (“AEP PPA Proposal”) with its affiliate AEP Generation Resources (“AEP Genco”).¹⁴ The AEP PPA Proposal envisions that AEP Ohio purchases the rights to a total of approximately 3,100 MW of generation output from nine generation units (including AEP Ohio’s holdings in OVEC which are not obtained under the proposed PPA, but included for cost recovery under the AEP PPA Proposal).¹⁵ Under the AEP PPA Proposal AEP Ohio would pay AEP Genco all historical and going forward costs associated with these generating units similar to if the generating units were under a cost of service regulatory framework.
19. The AEP PPA Proposal provides that AEP Genco would recover all operating costs associated with the units including a return on and of capital invested in the units both historically and in the future. The power products (energy, capacity, and ancillary services) produced by these generating units would be sold into PJM’s wholesale markets and the revenues received for the sales would be credited against the units’ costs and AEP Ohio ratepayers would either pay (when revenues are less than costs) or be paid (when revenues are greater than costs) the difference through the application of a non-bypassable rate rider. The AEP PPA Proposal provides AEP Genco with guaranteed cost recovery and return on investment for the nine generation units while AEP Ohio ratepayers accept all the costs and risks associated with these merchant generation resources.
20. Similarly, FirstEnergy Corp.’s (“FirstEnergy”) three Ohio monopoly transmission and distribution utilities: Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company (the “FE Companies”) have also

¹³ *Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Rider*, Case Nos. 14-1693-EL-RDR and 14-1694-EL-AAM, May 15, 2015, at 10:15-17 and Exhibit KDP-1 at page 7. Before the Public Utilities Commission of Ohio, Case Nos. 14-1693-EL-RDR and 14-1694-EL-AAM, December 14, 2015, Joint Stipulation and Recommendation (hereinafter “Joint Stipulation”).

¹⁴ See Exhibit No. AJC-1 which is the draft PPA that AEP Ohio submitted in association with its filing at the PUCO.

¹⁵ Three of the nine units, totaling 1,400 MW of capacity, are wholly owned by AEP Genco (See Direct Testimony of Toby L. Thomas in Support of AEP Ohio’s Amended Application, Before the Public Utilities Commission of Ohio, *In the Matter of the Application Seeking Approval of Ohio Power Company’s Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Rider*, Case Nos. 14-1693-EL-RDR and 14-1694-EL-AAM, May 15, 2015, at 3:1-5:19 (hereinafter “Thomas Direct Testimony”). Note that in the case of the OVEC generation, I understand OVEC invoices AEP Ohio its share of the costs associated with its rights to the generation output; this generation is not subject to the proposed PPA.

proposed an unprecedented long-term Power Purchase Agreement (“FE PPA Proposal”) whereby they will purchase generating unit contingent power for eight years from their affiliate FirstEnergy Solutions Corp (“FES”).¹⁶ In particular, the FE Companies propose to purchase all power products which are currently sold at wholesale in FERC-regulated markets from FES’ Davis-Besse (nuclear-fueled) and Sammis (coal-fueled) generating units.¹⁷

21. The FE Companies’ purchases would be made at the plants’ fully embedded costs, providing a fixed return of and on capital, as if the plants were still regulated under a cost of service framework. The Companies would then re-sell the acquired power products into the FERC-regulated wholesale markets. Like the AEP PPA Proposal, any losses that the FE Companies might experience for these transactions would be covered by a non-bypassable charge – a so-called Retail Rate Stability Rider (“Rider RRS”) – paid by their captive local ratepayers, and any gain that might be realized would be flowed through to those ratepayers under Rider RRS. Like the AEP PPA Proposal, the FE PPA Proposal asks the FE Companies’ captive ratepayers to take on merchant power business risk without the authority to manage the assets and shift for the next eight years the costs and risks of the noted power plants to the captive ratepayers in exchange for the right to sell the plants’ output into the wholesale electricity markets operated by PJM.
22. The terms and conditions under the FE and AEP PPA Proposals provide subsidization by AEP Ohio and the FE Companies’ captive ratepayers to maintain operations and support any future planned or unplanned capital investment. The PPA capacity payments under both proposals are based on the seller’s existing and future invested capital and provide a guaranteed return on equity (“ROE”).¹⁸ AEP Ohio and the FE Companies are obligated to make the PPA capacity payments regardless of whether the capacity resources generate sufficient earnings (margins) to cover the PPA capacity payment obligations. The FE Companies recognize that the PPAs will result in net costs to captive retail ratepayers in the near term.¹⁹ AEP Ohio has been less willing to recognize that its PPA proposal will cost ratepayers in the near term. However, it is simply impossible to conclude otherwise based on current power market prices.²⁰ The FE and AEP PPA Proposals provide financial subsidies to the

¹⁶ The FE Companies have not provided an actual proposed PPA. Instead the FE Companies have provided proposed terms and conditions that would provide a basis for a PPA (See Exhibit No. AJC-2).

¹⁷ The proposal also includes the purchase by the FE Companies of a small portion (115.9 megawatts) of OVEC capacity.

¹⁸ See Exhibit No. AJC-2 at Section 13, Exhibit No. AJC-1 at Article V and Page 11 and Mikkelsen Fifth Supplemental Testimony at Mikkelsen Workpaper November 30, 2015.

¹⁹ Mikkelsen Fifth Supplemental Testimony at Mikkelsen Workpaper November 30, 2015.

²⁰ See, for example, Supplemental Testimony of A. Joseph Cavicchi on Behalf of the PJM Power Providers Group and The Electric Power Supply Association, Before the Public Utilities Commission of Ohio, Case Nos. 14-1693-EL-RDR and 14-1694-EL-AAM, December 28, 2015 and Supplemental Direct Testimony of James

generation capacity resources outside of what would otherwise be earned through PJM's wholesale power markets or a competitively solicited long-term PPA.

23. In addition, the FE and AEP PPA Proposals protect FES and AEP Genco from bearing any risk associated with generating unit non-performance. For example, the FE Companies' PPA's supposed terms and conditions remarkably do not condition the PPA capacity payment upon unit availability or performance.²¹ Similarly, the AEP PPA Proposal provides that the seller continues to receive capacity payments regardless of generating unit performance. Moreover, the capacity pricing is not conditioned upon unit availability which is typical in these types of agreements.²² The FE and AEP PPA Proposals do not provide the sellers with an incentive to maintain high generating unit availability and do not penalize poor generating unit performance.
24. The FE and AEP PPA Proposals also do not provide AEP Ohio and the FE Companies with a clear process for reviewing and rejecting future capital investment that may be against the financial interests of the captive retail ratepayers. The FE PPA Proposal only allows the buyer to review and comment on, but not necessarily oppose, proposed capital expenditures at the beginning of each year for a 12-month period beginning June 1st of each year.²³ The AEP PPA Proposal is seemingly more flexible and indicates that buyer's approval would be required for major or material capital improvements projects, but offers no definition for what constitutes "major" or "material."²⁴ However, the AEP PPA Proposal provides for the formation of an "operating committee" that will meet at least annually to review resource operations and capital improvements. The operating committee is structured such that there are three members—AEP Genco, AEP Ohio, and the AEP Service Corporation—but only the first two entities are expected to typically cast votes when necessary, creating the possibility for tie votes. Under the proposed operating committee structure the AEP Service Corporation can cast a vote when there is a tie, and it would not be expected to cast its vote in the interest of AEP Ohio's captive retail ratepayers.
25. While an argument may be made that under PUCO regulatory oversight AEP Ohio and the FE Companies will be prevented from incurring future capital costs that are associated with uneconomic investment, there is little likelihood that an effective

F. Wilson, On Behalf of The Office of the Ohio Consumers' Counsel, Before the Public Utilities Commission of Ohio, Case Nos. 14-1693-EL-RDR and 14-1694-EL-AAM, December 28, 2015.

²¹ Exhibit No. AJC-2 at Section 13.

²² See Exhibit No. AJC-1 at Article 3.9 and V.

²³ Exhibit No. AJC-2 at Section 12.

²⁴ Exhibit No. AJC-1 at Article 4.2. Notably the AEP PPA Proposal does provide that AEP Genco will provide AEP Ohio with a confidential forecast of the upcoming three years of cost estimates for capital improvements which is critical information for the proper calculation of a competitive auction offer in PJM's capacity auctions.

mechanism will exist to preclude uneconomic investment. The only oversight process envisioned is that associated with a commitment by AEP Ohio and the FE Companies to allow the PUCO to conduct an annual compliance review to ensure that actions taken by AEP Ohio and the FE Companies when selling the output from the generation units under the riders into the PJM markets were not unreasonable.²⁵ It is practically certain that if the PPAs are approved the PUCO will strive to ensure captive ratepayers are financially better off. This means that if the PPAs are costly to captive ratepayers in their early years, the PUCO will logically exercise patience in the hope that the PPAs will generate financial benefits over the longer term. To provide an opportunity for the PPAs to generate future benefits for captive ratepayers requires that the capacity resources remain operational.

26. The PPAs and regulatory filings made in support of the AEP and FE PPA Proposals tell conflicting stories about the merchant viability of the subject generating units. Both companies strongly suggest that the units will retire without the proposed subsidies. For example FES's Donald Moul states that: "The economic viability of the Plants is in doubt"²⁶ and suggests that market-based revenues "are insufficient to permit FES to continue operating the Plants and to make the necessary investments."²⁷ Similarly AEP Genco's Toby Thomas states that: "these [PPA] units are marginal with respect to market-based revenue,"²⁸ and that, "the current forecast of low revenues in the next few years jeopardizes that [sic] long-term viability of the generating units and makes longer-term investments more challenging."²⁹ Mr. Thomas goes on to say: "This situation makes it more difficult to justify significant investment in these generating units in the near term to secure their supply of generation in the long-term, and will likely contribute to the retirement of these units sooner than if the units operated in an economic environment that exhibited less risk."³⁰ At the same time, however, both AEP Ohio and the FE Companies claim that their captive retail ratepayers will receive net financial credits through the proposed riders. If that were true, then there should be no need for the subsidies, because the units are economically viable over the longer term.

²⁵ Note this process appears to be ex-post and includes a provision that states: "Any determination that the costs and revenues included in the PPA Rider are unreasonable shall be made in light of the facts and circumstances known at the time such costs were committed and market revenues received (Third Stipulation at 8 and Joint Stipulation at 7)." This statement implies that decisions simply backed up by suitable analyses will be considered reasonable regardless if they are sensible over the longer term.

²⁶ Direct Testimony of Donald Moul on behalf of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company, Case No. 14-1297-EL-SSO, August 4, 2014, hereinafter, "Moul Direct Testimony," at 2.

²⁷ *Id.*

²⁸ Thomas Direct Testimony at 12:13-14.

²⁹ *Id.* at 12:15-17.

³⁰ *Id.* at 12:18-21.

27. Of course, if certain generating units under the PPA Proposals are currently unable to generate sufficient operating margins to cover the avoidable costs that are incurred to remain operational, there may be a genuine concern regarding sustaining the operations of the generating units. If this was the case, and generating unit operations were required to maintain reliability, then there could be a basis to subsidize certain units on a short-term basis to preserve reliability. That is not the case here, however, because, as PJM has made clear in the PUCO proceedings, the units being subsidized under the PPAs are not needed to preserve reliability. If the subsidies are simply delaying the exit of uneconomic resources, then the result of subsidizing their continued operation is no different than subsidized uneconomic entry: capacity market supply is artificially increased putting downward pressure on market prices, all other things unchanged.

III. FE AND AEP PPA PROPOSALS WILL DISTORT PJM POWER MARKET PRICES AND FUTURE RESOURCE INVESTMENT DECISIONS

A. PJM's Wholesale Power Markets

28. PJM operates a set of electricity markets designed with the objective of providing wholesale power to customers in its footprint efficiently and reliably. PJM seeks to develop and implement market rules and a market structure to foster competition in support of this objective, while guarding against the exercise of market power. PJM's energy and capacity market rules are meant to guard against the exercise of market power by implementing a market design that provides incentives to market participants to offer supply to the market place based on short-run and long-run marginal costs. At the same time PJM's market power monitoring and mitigation rules intend to ensure that buyers in the market place make decisions based on market prices resulting from competitive supplier offers.

29. PJM's energy and capacity markets guide generation resource operation, retirement, and future investment. The Commission expects that PJM's competitive market design will result in a least-cost, reliable resource mix for the region.³¹ In spite of considerable evolution since being introduced, PJM's wholesale power markets have

³¹ For example, the FERC has stated: "In a competitive market, prices do not differ for new and old plants or for efficient and inefficient plants; commodity markets clear at prices based on location and timing of delivery, not the vintage of the production plants used to produce the commodity. Such competitive market mechanisms provide important economic advantages to electricity customers in comparison with cost of service regulation. For example, a competitive market with a single, market-clearing price creates incentives for sellers to minimize their costs, because cost-reductions increase a seller's profits. And when many sellers work to minimize their costs, competition among them keeps prices as low as possible. While an efficient seller may, at times, receive revenues that are above its average total costs, the revenues to an inefficient seller may be below its average total costs and it may be driven out of business. This market result benefits customers, because over time it results in an industry with more efficient sellers and lower prices. (117 FERC ¶61,331 at P 141 (2006), *order on reh'g*, PJM Interconnection, L.L.C.)"

consistently demonstrated that market-based power pricing can be relied upon to guide capacity resource investment and retirement decisions.³²

30. For example, PJM's wholesale power markets have supported new investment in supply-side resources while simultaneously accommodating the retirement of thousands of megawatts ("MWs") of generation resources. As Exhibit No. AJC-3 shows, PJM capacity resource additions have supplanted capacity resource retirements and PJM has continued to maintain an adequate reserve margin.³³ Exhibit No. AJC-3 also shows that a large number of these new capacity resources are new generation resources that have cleared in PJM's capacity market auctions over the last three to four years. The majority of these new generation resources are actively under construction.³⁴
31. A number of the generation capacity resources under development and construction are located in Ohio. Exhibit No. AJC-4 shows that several high efficiency, low emission, gas-fired generation resources are under development and construction in Ohio. All but one of these plants has received Ohio Power Siting Board approval, and all are actively engaged in the PJM generation interconnection process.³⁵ Three of these plants—Oregon Clean Energy (800 MW), Carroll County Energy (740 MW), and Middleton Energy Center (510 MW)—are under construction.³⁶ In addition,

³² See Pfeifenberger, Johannes, *et al.*, "Second Performance Assessment of PJM's Reliability Pricing Model: Market Results 2007/08 through 2014/15," The Brattle Group, August 26, 2011, p. 159, available at <http://www.pjm.com/~media/committees-groups/committees/mrc/20110818/20110826-brattle-report-second-performance-assessment-of-pjm-reliability-pricing-model.ashx>.

³³ See, for example, PJM RPM capacity market auction reports available by delivery year at <http://www.pjm.com/markets-and-operations/rpm.aspx>.

³⁴ See Exhibit No. AJC-3 which provides various references confirming generation resource construction is underway.

³⁵ See: 1) *In the Matter of the Application of Carroll County Energy LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility*, Case No. 13-1752-EL-BGN, Opinion, Order, and Certificate April 28, 2014; 2) *In the Matter of the Application of NTE Ohio, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility in Middletown, Ohio*, Case No. 14-534-EL-BGN, Opinion, Order, and Certificate November 24, 2014; 3) *In the Matter of the Application of Oregon Clean Energy, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility*, Case No. 12-2959-EL-BGN, Opinion, Order, and Certificate May 1, 2014; and, 4) *In the Matter of the Application of Rolling Hills Generating for an Amendment to the Certificate of Environmental Compatibility and Public Need for the Rolling Hills Generating Combined-Cycle Conversion Project in Vinton County, Ohio*, Case No. 12-1669-EL-BGA, Opinion, Order, and Certificate May 1, 2013. See also: <http://www.pjm.com/planning/generation-interconnection/generation-queue-active.aspx>.

³⁶ See Ohio Power Siting Board: 1) *In the Matter of the Application of Oregon Clean Energy, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility*, Case No. 12-2959-EL-BGN, Opinion, Order, and Certificate May 1, 2013 and Notice of Start of Construction November 12, 2014; 2) *In the Matter of the Application of Carroll County Energy LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility*, Case No. 13-1752-EL-BGN and Case No. 14-2085-EL-BGA, Notice of Commencement of Construction, April 7, 2015,a and; 3) *In the Matter of the Application of NTE Ohio, LLC for a Certificate of Environmental Compatibility*

existing resources that were planning to retire are being kept in service and new capital investment is being made in existing plants.³⁷ PJM's wholesale market is bringing forth new generation capacity and investment in existing facilities, particularly in Ohio where there has been recent retirement of older, less competitive plants and development of favorable indigenous gas supply sources.³⁸

B. Subsidization by Captive Ratepayers of Generating Resources Under the AEP and FE PPA Proposals will Distort PJM's Capacity Market Prices.

32. In the PJM RPM capacity resource auction market buyers (including entities like the FE Companies and AEP Ohio) contract with capacity owners (sellers like FES and AEP Genco) for their capacity needs three years in advance. In these capacity markets, system reliability is accounted for through capacity supply requirements determined for PJM as a whole and for sub-regions, and the economic viability of capacity supply offers into the auction that differ by location and cost is determined through the auction. Without subsidy (in this instance from captive ratepayers under non-market based PPAs), less efficient generation with higher costs cannot be rationally offered into the market at the prices that lower-cost units can afford to offer. If capacity requirements can be satisfied with enough of the former, the lower-cost units are selected in the PJM auctions and higher-cost units are not. In the process, incentives for efficient operation and management are brought to bear on all current and potential capacity resource sellers.
33. The PJM RPM capacity market provides "incentives that are designed to stimulate investment both in maintaining existing generation and in encouraging the development of new sources of capacity."³⁹ When a market participant sells capacity resources in the RPM capacity auctions it takes on a commitment to provide

and Public Need to Construct an Electric Generation Facility, Case No. 14-534-EL-BGN, Notice of Commencement of Construction October 5, 2015.

³⁷ See, NRG's announcement to use coal sourcing and install backend controls on Unit 9 of its Avon Lake facility (638 MW) to achieve MATS compliance and continue running the unit on coal. See NRG Reset, Business Update at 13 (Sept. 18, 2015) available at: <http://phx.corporate-ir.net/External.File?ti=1&item=VHlwZT0yfFBhcmVudEIEPTUyMDM0Mzh8Q2hpbGRJRD01OTUyNjk=> and NRG's statements that it will continue to run the unit on coal as a bridge to a future natural gas addition project. The Chronicle-Telegram, "NRG may receive gas from NEXUS pipeline project" (Nov. 24, 2015) available at: <http://chronicle.northcoastnow.com/2015/11/24/nrg-may-receive-gas-from-nexus-pipeline-project/>. See also, http://phx.corporate-ir.net/phoenix.zhtml?c=147906&p=irol-newsArticle_Print&ID=1960327 (accessed March 14, 2016), where Dynegy discusses its recent purchase of Duke Energy assets in Ohio.

³⁸ See, for example, "Shale Development Ramping Up Rapidly in Ohio," *Oil Daily*, December 10, 2014, and "Ohio's Natural Gas Boom Brings Flurry of Pipeline Construction," Jon Chavez, *The Blade*, Toledo, Ohio, December 7, 2014.

³⁹ See, <http://www.pjm.com/~media/about-pjm/newsroom/fact-sheets/rpm-fact-sheet.ashx>, accessed on March 14, 2016.

generation capacity three years in the future.⁴⁰ Capacity market auction prices signal the market's expectations of the going-forward cost to keep and/or bring capacity into operation and avoid shutdown. Generators that expect to operate profitably based on capacity prices and expected energy market margins continue operating, while generating units that are not profitable given capacity prices may choose to suspend or shutdown operations.

34. The FE and AEP Ohio PPA Proposals provide the incentive to the AEP Ohio and FE Companies to offer the generating resource capacity under the PPA contracts into PJM's capacity market at prices that do not reflect the generating units' net-going forward costs.⁴¹ As explained above, under the FE and AEP PPA Proposals AEP Ohio and the FE Companies are obligated to make capacity payments regardless of whether or not the generating units are accepted in PJM's capacity auctions.⁴² Moreover, under the FE and AEP PPA Proposals the AEP Ohio and FE Companies cannot reduce fixed PPA capacity payment obligations or pass through PJM capacity performance costs (or benefits) to FES and AEP Genco in association with generating unit availability and performance.⁴³ Thus, AEP Ohio and the FE Companies will seek to maximize the capacity revenues associated with the generating resources and be left to hope that potential poor generating unit operating performance does not result in financial penalties as captive ratepayers will be responsible for any unexpected costs.⁴⁴
35. To maximize generating unit capacity revenues AEP Ohio and the FE Companies can be expected to offer the capacity resources into the market at the lowest price possible to ensure that they are accepted by PJM in the capacity auction. Offering capacity into PJM's auctions at an artificially lower price will, all other things equal, lower capacity market revenues realized by other market sellers and will raise electricity consumers' prices over the longer term as subsidized capacity prevents new, efficient resources from entering the market or existing generating units that are more efficient than the PPA generators uneconomically from exiting.

⁴⁰ See, <http://www.pjm.com/LearningCenter%20Content/Home/three-priorities/buying-and-selling-energy/capacity-markets.aspx>, accessed on March 14, 2016.

⁴¹ Competitive offers in PJM's RPM auctions are expected to be calculated starting with a generating unit's fixed going forward costs to remain operational and then reducing these costs by expected future energy market margins. The result of this calculation is referred to as the unit's net-going forward costs.

⁴² See Exhibit Nos. AJC-1 and AJC-2 at Article V and Section 13, respectively.

⁴³ Id.

⁴⁴ Although the FE and AEP PPA Proposals require that AEP Ohio and the FE Companies submit RPM auction offers associated with the generating units, logically there would need to be severe financial performance penalties incurred due to poor generating unit operations before a generating unit would be offered so as to potentially not clear in the auction. Of course, in this scenario captive ratepayers are then receiving no guaranteed capacity revenues which is contradicts the stated purpose of the PPAs.

36. For example, Exhibit No. AJC-5 provides an illustration of PJM capacity market supply curves with and without subsidized generating resources. In Exhibit No. AJC-5 the supply curve on the left, labelled “Supply (No Subsidy)” illustrates the auction clearing price absent subsidized resources (about \$140/MW-Day). The supply curve on the right, labelled “Supply (Subsidy)” illustrates the impact of 2,000 MW of subsidized resources now offering at \$0/MW-Day. As Exhibit No. AJC-5 shows, the auction clearing price declines to about \$120/MW-Day as a result of the subsidized resources no longer making offers at a competitive level.
37. As Exhibit No. AJC-5 shows, less costly generating units would be crowded out by the inefficient, subsidized generating units. Without the subsidy, the net going-forward cost to avoid shutdown for the inefficient generators is above the capacity market-clearing price. The subsidy lowers the amount of revenue the inefficient generator requires to avoid shutdown. With the subsidy, the inefficient generators’ offer in the PJM RPM capacity market is lower (likely zero or near zero), and this lower offer results in a lower market clearing price. The lower clearing price crowds out generators whose net-going forward cost is between the inefficient generators’ subsidized and unsubsidized capacity offers.

C. Estimated Financial Impact of Proposed Subsidization

38. The financial impact of the change in capacity market bidding behavior that will result from the FE and AEP PPA Proposals can be estimated using actual capacity market auction data produced by PJM. It is especially important to recognize that the impact of the proposed subsidization can be expected to be substantial.
39. Using actual data made available by PJM it is possible to estimate the financial magnitude of a shift in the supply curve like that illustrated in Exhibit No. AJC-5. For example, following the PJM RPM auction PJM publishes what are referred to as “bra-scenario-analysis.”⁴⁵ In these analyses PJM reports the results of various sensitivity analyses that examine what the change in capacity market auction results would be under different supply/demand conditions. One of PJM’s auction scenarios closely parallels the impact of adding low-priced supply to the auction supply curve.
40. The particular “bra scenario” result of interest is one where PJM adds 3,000 MW of supply to the bottom of the supply curve in the region outside of MAAC (rest of RTO). The results of PJM’s real-world example of the impact of the addition of 3,000 MW is a decrease in auction clearing price of \$16.27/MW-Day (\$164.77-\$148.50/MW-Day). Based on the quantity of capacity resources cleared without the 3,000 MW supply curve shift, the lower auction clearing price translates into a

⁴⁵ Scenario Analysis for Base Residual Auction, December 28, 2015, available at: <http://www.pjm.com/markets-and-operations/rpm.aspx>.

reduction in capacity seller revenues of \$990 million. Although a precise projection of the PPA generating units' capacity auction offers absent the PPAs cannot be developed without detailed cost data for the generating units, the financial impact on other market sellers of a supply curve shift of several hundred megawatts will clearly be reduced capacity auction revenues of hundreds millions of dollars.

41. AEP Ohio and the FE Companies will not face the same incentives to develop competitive offers as those that FES clearly faced when bidding into the capacity market auctions competitively.⁴⁶ The degree of shift in PJM RPM clearing prices that might occur under the PPAs depends on the number of megawatts of the PPA generation cleared and did not clear in the prior RPM. Historical PJM capacity market auction data show that it is likely that at least a portion of the PPA generating resources have not cleared in prior capacity market auctions.
42. For example, PJM has regularly reported that a number of capacity resources are not accepted in its annual auctions, and that an increasing number of these generation resources are fueled by coal.⁴⁷ Next, PJM's Independent Market Monitor ("IMM") reports in its annual PJM state of the market report that there are a number of capacity resource sellers that have auction offer price caps that are above auction clearing prices, and that coal-fired resources have relatively higher going forward costs.⁴⁸ Finally, PJM reports that a number of capacity resources' offers in its recent auctions are above auction clearing prices which result in generating resources not clearing in the auction.⁴⁹

⁴⁶ It is important to note that AEP Genco's proposed PPA generation resources until just this capacity delivery year (2015/16) had been committed to meet AEP Ohio's capacity obligations under PJM's Fixed Resource Requirement ("FRR") tariff option of meeting capacity obligations (See: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2014-2015-fr-resources.ashx> where the AEP PPA Proposal generating units are indicated as being used to meet AEP Ohio's FRR). Since that time AEP Genco has reported that it intends to sell its non-PPA generating units and has otherwise reported clearing its PPA generating units in anticipation of committing the units to AEP Ohio (See *SNL Extra*, AEP braces for PPA legal challenges, moves ahead with merchant asset sale, Darren Sweeny, *SNL Electric Utility Report*, February 8, 2016 and AEP Capacity Performance Summary, September 10, 2015, available at: http://aep.com/investors/EventsPresentationsAndWebcasts/documents/Capacity_Performance_Summary.pdf).

⁴⁷ See, for example, PJM 2016/2017 RPM Base Residual Auction Results, at Figure 3 – Offered and Cleared Quantities of Coal and Gas, which shows increasing quantities of uncleared coal generation resources, available at: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2016-2017-base-residual-auction-report.ashx>.

⁴⁸ See PJM IMM Monitoring Analytics, *State_of_the_Market Report for PJM, 2015, Volume 2, Detailed Analysis*, Section 5, 209 and Table 5-20 APIR statistics: 2018/2019 RPM Base Residual Auction, March 10, 2016. Available at: http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2015/2015-som-pjm-volume2-sec5.pdf.

⁴⁹ See, for example, Exhibit No. AJC-6 which reports that in the 2016/17 annual auction more than 17,000 MW of resources offered at above a price of \$100/MW-Day where the annual auction clearing price was below \$100/MW-Day in most regions of PJM.

43. The historical PJM auction result data also show that a significant amount of capacity did not clear in the FE Companies' zone (FE's American Transmission Systems, Inc. or "ATSI" zone) in the 2016/17 annual capacity auction. In particular, PJM reported that approximately 4,000 MW Unforced Capacity ("UCAP") did not clear in the annual RPM auction for the 2016/17 delivery year.⁵⁰ Within the ATSI zone, almost all the existing capacity resources that offered into the auction are owned by FES and FES reported that only 7,600 MW of its ~ 10,000 MW cleared.⁵¹ Thus, approximately 25% of FES' generation capacity resources did not clear in the 2016/17 PJM RPM capacity auction.
44. FES did not report publicly which of its generation capacity resources did not clear in the 2016/17 annual capacity auction. However, in order to obtain the flexibility to adopt alternative offer caps for particular generating units a market seller must submit to the PJM IMM capital cost data to support the request for an offer cap above PJM's default cap levels.⁵² Clearly FES's capacity resource offers in the 2016/17 annual PJM capacity auction had to have been above the \$114/MW-Day auction clearing price for the ATSI zone (or locational deliverability area, LDA, under PJM's terminology).⁵³
45. Additionally, it can be inferred that the majority of capacity that did not clear the auction is likely coal-fired, increasing the likelihood that it was from the PPA generators. In order to establish cost levels for alternative offer caps that result in the receipt of cap levels above likely clearing prices typically requires the inclusion of an Avoidable Project Investment Rate ("APIR"). APIR is the cost category wherein generating units that seek to "test" whether PJM's auction market clearing prices will support future operations are allowed to incorporate capital investment in their auction offer. Because coal-fired resources are resources that have readily been identified as facing capital investment in association with maintaining the ability to operate reliably and in compliance with environmental regulations, these generating units are among those that can provide the cost data to support alternative offer caps.

⁵⁰ PJM 2016/2017 RPM Base Residual Auction Results, at Table 4 –RPM Base Residual Auction Clearing Results in the LDAs, available at: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2016-2017-base-residual-auction-report.ashx>.

⁵¹ *RTO Insider*, FirstEnergy Wants Regulated Companies to Subsidize Generation, August 12, 2014, available at: <http://www.rtoinsider.com/firstenergy-subsidize-gen/>.

⁵² PJM Open Access Transmission Tarff, Attachment DD.6., Market Power Mitigation, at 6.7, Effective Date: 8/25/2015 – Docket#: ER15-2370-000.

⁵³ PJM 2016/2017 RPM Base Residual Auction Results, at Table 4 –RPM Base Residual Auction Clearing Results in the LDAs, available at: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2016-2017-base-residual-auction-report.ashx>.

Thus, those generating units that FES has not cleared in PJM RPM annual auctions can be expected to be coal-fired units.⁵⁴

D. FE and AEP PPA Proposals will Further Exacerbate Capacity Market Impacts by Supporting Longer-Term PPA Generating Unit Uneconomic Operations

46. The guaranteed recovery of all costs including a return on equity will create incentives for AEP Genco and FES to sustain inefficient operations (i.e., operations and investment that would not be economic under PJM's market-determined prices). Under the PPA Proposals AEP Genco and FES will almost certainly be allowed to pass through all costs (including a guaranteed return) associated with the generating units resulting in AEP Ohio's and the FE Companies' ratepayers bearing the risks otherwise borne by FES and AEP Genco. These generation company incentives will be more aligned with those of generating plant owners facing traditional cost-of-service, rate-of-return regulation (however without full control over asset operations). Public policy economics recognizes that rate-of-return regulation, an important regulatory tool when companies display the characteristics of natural monopoly, distorts owners' investment incentives in ways that drive up costs to ratepayers.⁵⁵
47. The results of subsidizing these risks is that FES and AEP Genco would rationally seek to make capital investments in the plants to support continued operations so long as the contractual ROE for these investments meets or exceeds the ROE FES and AEP Genco would earn for alternative capital investments. Importantly, the ROE for the investments is fixed under the AEP and FE PPA Proposals, rather than being market-determined in the usual manner for merchant generation investments. This means that FES and AEP Genco may make incremental capital investments in the PPA generation even when such investments would be uneconomic when viewed from the perspective of an investor facing an ROE set by market forces. The costs of incentives to make uneconomic and distorted investment decisions will be borne by AEP Ohio's and the FE Companies' captive ratepayers.

⁵⁴ FES has recently reported that one of its coal-fired units—the 2,500 MW Bruce Mansfield plant—had not cleared more recent annual capacity auctions. See, Anya Litvak Anya, *Pittsburgh Post-Gazette*, FirstEnergy looks to switch the topic from power plants, February 19, 2015, available at: <http://powersource.post-gazette.com/powersource/companies/2015/02/19/FirstEnergy-looks-to-switch-the-topic-from-power-plants/stories/201502190090>

⁵⁵ “Rate-of-return regulation gives the firm incentives to misreport cost allocations, choose an inefficient technology (in some cases), undertake cost-reducing innovation in an inefficient way, under produce in a noncore market, price below marginal cost in a competitive market which happens to be included in the set of core markets regulated by an aggregate rate-of-return constraint, and view diversification decisions inefficiently.” Braeutigam, R. R., & Panzar, J. C. (1989), “Diversification Incentives under ‘Price-Based’ and ‘Cost-Based’ Regulation,” *The RAND Journal of Economics*, 373-391.

48. An additional, substantial concern is that the AEP and FE PPA Proposals provide AEP Genco and FES no incentives to operate efficiently in real-time.⁵⁶ Because all operating costs are passed through to captive ratepayers under the PPAs, there is no incentive to cut costs when possible, such as by reducing staffing or negotiating favorable maintenance contracts. There is also no incentive to make sure the units are available to run when they are most likely to be in-merit to supply energy or are needed for reliability. Even if the units have historically been in-merit during certain weather conditions, for example, there is no incentive under the contracts to insure that they will be in the future. In contrast, other generation owners in PJM's wholesale markets are under constant pressure to minimize the costs of operation and remain available when their energy is most valuable. The operating performance of the generators under the PPAs can reasonably be expected to deteriorate relative to historical levels.

E. Longer-Term Power Market Impacts

49. The subsidies under the AEP and FE PPA Proposals will benefit less efficient producers (i.e., the PPA generating units, which receive the subsidy) at the expense of more efficient and cost-effective generators that would otherwise supply additional power and/or enter the market if the generating units were not subsidized by the captive ratepayers. Ultimately, the extra costs resulting from shifting capacity payments from efficient producers to the less efficient PPA producers will crowd out new, efficient investment and may lead to the exit of existing generation that is more economic than the generation under the PPAs. In the longer run, the total costs of energy supply will be higher (in terms of all-in costs comprised of both capacity and energy components) than it would have been in the absence of the subsidy, all else being equal. The cost increase will include additional costs incurred to purchase capacity and energy required to maintain reliability from units other than the PPA generating units, because these generating units cannot be expected to be available when needed for reliability. These differences in cost will have to be paid for, and will be paid for, by consumers in the economy.
50. There is an even worse scenario, moreover, in which the PPA subsidies lead to a slippery slope towards additional subsidies for generation now operating in competitive markets. As I have explained, the PPA subsidies will suppress capacity market prices, which could lead to requests for additional subsidization to keep sufficient existing capacity in the markets. Additional subsidization might also be

⁵⁶ The PPA Proposals do not provide the sellers with a clear incentive to maintain high generating unit availability as when units are on outage the seller is not penalized. Moreover, the capacity pricing is not conditioned upon unit availability which is typical in these types of agreements (See Exhibit Nos. AJC-1 and AJC-2 at Article V and Section 13, respectively).

required for units needed for reliability to compensate for the lack of performance incentives for the subsidized units. And to the extent that such out of market payments expand, regulators will realize the need to monitor and evaluate the performance and cost-effectiveness of the subsidized generation. Ultimately, this scenario could slide slowly toward a return to traditional rate of return regulation where generation investments are controlled by a regulatory approval process rather than being driven by market forces. This is exactly the regulatory structure that market competition is intended to replace.

IV. ENHANCEMENT TO THE PJM MOPR WILL MINIMIZE OR ELIMINATE POSSIBLE PPA INDUCED AUCTION MARKET PRICING DISTORTIONS

51. Because the primary RPM market auctions occur only once per year, it is imperative that the RPM market design rely on rule structures that minimize inefficient outcomes. Thus, PJM RPM market rules seek to ensure that sellers make supply resource offers based on projected long-run marginal costs and that buyers cannot take actions to depress market prices and lower capacity acquisition costs. Although these rules have been strongly debated, the resulting market design is producing auction outcomes where sufficient new generation supply is being brought to market, offsetting retirements, and at market price levels that are generally recognized as resulting from competitive offers (see above).⁵⁷
52. To ensure that the PJM RPM market rules continue to guard against the threat of anti-competitive offers arising from out-of-market subsidization of a subset of generation resources requires the addition to PJM's RPM Tariff an Existing Generation Capacity Resource⁵⁸ MOPR. The EGCR MOPR will apply to existing capacity resources that receive subsidization from an out-of-market contractual agreement.⁵⁹ Generally, the EGCR MOPR would apply under narrow circumstances where EGCRs obtain out-of-market subsidization from an affiliated regulated utility arising via a regulatory action that was not subject to an open, competitive, arms-length and non-discriminatory process.

⁵⁷ Defining and enforcing power market rules that provide sound economic incentives to market buyers and sellers can be complicated. PJM's stakeholder processes, informed by assessments and analyses by PJM and its IMM, have largely driven PJM's market design and as such its evolution has been influenced by the interests of PJM stakeholders. Stakeholder considerations have been especially prominent in the design of PJM's capacity market.

⁵⁸ As defined in Section 1.20B of the RAA.

⁵⁹ It is important to note that the MOPR guards against the potential exercise of buyer market power (monopsony) where a large buyer may seek to push prices downward by adding capacity so that it reduces the costs of the purchase of all other capacity by that large buyer. Although the circumstances of the PUCO proceedings focus on other reasons for subsidizing electric generating capacity, it could be the case that the proposed subsidization will result in an exercise of buyer market power in the absence of an EGCR MOPR.

A. Economic Principles for Developing Competitive Offers in PJM's RPM Capacity Performance Market

53. The objective of the EGCR MOPR is to set an RPM offer floor price on existing generation resources that may otherwise seek to make offers below an economically acceptable measure of the price associated with a competitive offer. In order to achieve this objective it is first important to recognize the economic principles that guide the development of competitive offers in PJM's RPM auctions. Under PJM's RPM capacity performance product market design the economic principles that apply to developing competitive auction offers have been carefully considered and documented in detail.⁶⁰
54. In particular, in association with the Commission's review of PJM's RPM capacity performance market proposal the PJM IMM submitted an economic analysis that provides an overview of the framework for the calculation of a competitive offer for a capacity resource participating in PJM's RPM auction.⁶¹ While the economic principles are relatively straight forward, the derivation and calculation of a competitive capacity auction offer is detailed. However, when distilled down to basic economic principles a competitive offer is simply a function of the expected costs and benefits of taking on a capacity market supply obligation ("CMSO").
55. The first economic principle associated with developing a competitive offer to supply capacity is the recognition that taking on a CMSO exposes a seller to both risk and reward. A CMSO exposes a seller to the risk that the accepted capacity resource may not perform during Performance Assessment Hours ("PAHs").⁶² Under PJM's RPM tariff the hourly non-performance charge is currently in the range of approximately \$2,500-\$3,700/MWh depending upon resource geographic location.⁶³ In addition, a capacity performance resource can be assessed non-performance charges that significantly exceed annual capacity market revenues associated with a CMSO.⁶⁴ Thus, the potential cost associated with a CMSO can be substantial in the event of poor resource performance. At the same time, non-performance charges assessed and

⁶⁰ See Answer and Motion for Leave to Answer of the Independent Market monitor for PJM, Docket Nos. ER15-623-000 and EL15-29-000, February 25, 2015, Corrected February 27, 2015 ("IMM Answer").

⁶¹ IMM Answer at Appendix A: Competitive offer for a capacity performance resource in PJM.

⁶² PAHs are those hours during a year where PJM faces periods of potential capacity resource scarcity and have been estimated initially as 30 hours per year (PJM Open Access Transmission Tarff, Attachment DD.10.A, Charges for Non-Performance and Credits for Performance, Effective Date: 4/1/2015 – Docket#: ER15-623-004).

⁶³ See, Final CP Market Seller Offer Cap Values, 2019/20 Delivery Year, available at: <http://www.pjm.com/markets-and-operations/rpm.aspx>. Note that to convert an offer cap value to \$/MWh from \$/MW-Day multiply by 365 days/year and divide by 8760 hours/year.

⁶⁴ See, PJM Open Access Transmission Tarff, Attachment DD.10.A, Charges for Non-Performance and Credits for Performance, Effective Date: 4/1/2015 – Docket#: ER15-623-004. Note that the stop-loss provision is 1.5 times net-CONE which results in a potential penalty of about three times the revenues associated with a CMSO in PJM's first capacity performance product auction.

collected by PJM as a result of PAHs are re-distributed to resources without a CMSO that perform during PAHs, and resources that perform above their CMSO during PAHs. These potential revenues, which can also be substantial for capacity resources that do not have a CMSO, must be weighed against the cost associated with taking on a CMSO.

56. The second economic principle associated with developing a competitive offer to supply capacity is the recognition that capacity resources will incur going forward costs for fixed operation and maintenance services and incremental capital investment. These costs are commonly referred to as “avoidable costs” and under PJM’s tariff the term Avoidable Cost Rate (“ACR”) is defined as the sum of all avoidable costs a generating capacity resource would avoid if it was to suspend operations or retire.⁶⁵ However, operational capacity resources can be expected to realize margins associated with energy sales which will reduce a capacity resource’s ACR. Thus, when evaluating a competitive auction offer ACR is measured as “Net-ACR” which is ACR reduced by the estimated contribution of a resource’s energy and ancillary services markets’ earnings. Positive Net-ACR represents an estimate of the revenues a capacity resource must recover from the capacity market in order to continue to achieve favorable economic operations.
57. The third economic principle associated with developing a competitive offer to supply capacity is the recognition that there are a number of different capacity resource technologies and there can be a wide range of Net-ACRs applicable to these different technologies. An indication of the possible range of Net-ACR can be illustrated by examining PJM’s estimates of default ACR for various different resource technologies. PJM reported for the 2018/19 capacity delivery year that the range of default ACR for various generation resource technologies was \$25-\$169/MW-Day for units that do not intend to retire (note the high end of the range applies to coal-fired generating units).⁶⁶ Depending upon capacity resources’ relative earnings from PJM’s energy and ancillary services markets, a wide range of Net-ACR will result.⁶⁷ A wide range of net-ACR across capacity resources implies different economic determinants for competitive capacity offers.

⁶⁵ PJM Open Access Transmission Tariff, Attachment DD.6., Market Power Mitigation, at 6.8(a), Effective Date: 8/25/2015 – Docket#: ER15-2370-000.

⁶⁶ See PJM RPM Default Avoidable Cost Rates for the 2018/2019 Delivery Year, available at: <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/default-acr-values-for-the-2018-2019-dy.ashx>. Note that PJM also reports higher default ACR rates for units that are willing to commit to retire in the absence of a capacity auction clearing price that is high enough to guarantee revenues at least equal to the retirement ACR value.

⁶⁷ Evidence of the wide range of Net-ACR can be seen in Exhibit No. AJC-6 where actual capacity market offers span a range of \$0/MW-Day to over \$200/MW-Day.

58. The combination of these three economic principles allows for the derivation of capacity market auction competitive offers based on the economics faced by individual resources. Logically there are two distinct sets of economic circumstances to consider when estimating a capacity resource's competitive offer. First, in those cases where a resource estimates a Net-ACR that is low or zero, the resource expects to be economic to operate without taking on a CMSO. Thus, in order for the low Net-ACR resource to be willing to take on a CMSO the estimated profit associated with the CMSO must be equal or be greater than estimated profits the unit would realize as an energy-only resource. Second, in those cases where a resource estimates a positive Net-ACR in the absence of a CMSO, the resource must be compensated for its required Net-ACR and the estimated cost of potential non-performance.
59. Assuming no uncertainty in the estimate of costs and benefits associated with estimated PAHs and capacity resource performance it is possible to derive a competitive offer for each of the cases described above. In the first case the competitive offer is equal to the expected revenues for a resource with a CMSO minus the expected revenues for a resource without a CMSO. In other words, for a resource that expects to be profitable without taking on a CMSO, it must be more profitable for the resource to take on a CMSO. In order for it to be more profitable to take on a CMSO, the resource will submit an offer that is based on Net-CONE, which represents the opportunity cost of taking on a CMSO.⁶⁸
60. In the second case the capacity resource competitive offer is based on the difference between Net-ACR and expected capacity resource performance payments. This means that the resource must expect to recover its Net-ACR adjusted upward or downward for expected benefit or cost associated with taking on a CMSO. The estimated cost and benefit of taking on a CMSO will depend significantly on historical capacity resource performance and the coincidence of PAHs. However, for capacity resources with a relatively high Net-ACR it is likely that Net-ACR will factor significantly into the calculation of a competitive offer. Thus, for resources with high Net-ACR, the level of net going forward costs is a key factor in the calculation a competitive auction offer.
61. In each of the two cases of competitive auction offer development described above key inputs into the calculation are subject to uncertainty. In particular, capacity resource performance during PAHs and the number of PAHs are difficult to forecast.⁶⁹ The uncertainty associated with the estimated values of these important

⁶⁸ Precisely the resource competitive offer is expected to be equal to Net CONE multiplied by the "Balancing Ratio" (referred to as "B"). See IMM Answer at Appendix A for a detailed derivation of this result.

⁶⁹ It is also the case that the "balancing ratio" is subject to uncertainty. However the estimated range of the balancing ratio based on historic data is not nearly as significant as the range of possible PAHs and capacity resource performance (See IMM Answer at Appendix B).

determinants of a competitive auction offer require the inclusion of a risk premium, or as the PJM tariff defines it, Capacity Performance Quantifiable Risk (“CPQR”).⁷⁰ The CPQR incorporates into the competitive auction offer the cost of the risk associated with being unable to forecast accurately a capacity resources performance during PAHs and the number of PAHs that may occur. The CPQR is particularly important for capacity resources that face high Net-ACR and uncertain performance, or where an instance of non-performance during PAHs would be very costly.⁷¹

62. In summary, the application of economic principles to PJM’s RPM capacity performance auction market elucidates the analytical considerations that are expected to guide RPM competitive resource auction offers assuming resource sellers face profit maximizing incentives. However, subsidized resources, like those covered by the AEP and FE PPA Proposals, cannot be expected to be offered into the capacity market auctions consistent with these economic principles. Instead, it is expected that RPM auction offers will be below competitive levels in order to maximize capacity market revenues (see Section III.B.).⁷² To guard against artificially low capacity market auction offers the proposed EGCR MOPR is defined and applied based on the economic principles of competitive auction offers described above.

B. Definition and Application of the EGCR MOPR

63. The proposed EGCR MOPR is defined based upon the analysis developed by the IMM in support of PJM’s RPM capacity performance product introduction in 2015.⁷³ The definition of the EGCR MOPR assumes that in each RPM auction (both base residual auctions and incremental auctions) the generating units subject to the EGCR MOPR are expected to remain operational for the delivery year for which they are offered.⁷⁴ The EGCR MOPR floor price is defined as an auction offer price not less than:

$$\text{Net CONE} * B;$$

⁷⁰ See PJM Open Access Transmission Tariff, Attachment DD.6., Market Power Mitigation, at 6.8(a), Effective Date: 8/25/2015 – Docket#: ER15-2370-000.

⁷¹ Inclusion of CPQR in a competitive auction offer requires that a unit-specific offer cap be requested under the PJM tariff. In instances where units have low Net-ACR the competitive offer cap of net-CONE * B is expected to provide capacity resources sufficient latitude to develop auction offers without requesting a unit-specific offer cap. However, there can be instances where a low Net-ACR resource will seek a unit-specific offer cap if poor performance could result in significant financial penalties.

⁷² The IMM Answer notes that an exception to the offer cap level adopted in the PJM RPM capacity performance proceeding “would be that if the offer is less than the competitive level, the offer should be subject to unit-specific review by the Market Monitoring Unit” (IMM Answer at 3).

⁷³ IMM Answer at Appendix B.

⁷⁴ This assumption simply acknowledges the fact that if the generating units were to retire they would no longer be offered into the capacity market auctions and presumably no longer be subject to the PPAs.

Or if a capacity resource seller that can provide unit-specific cost data that validate a lower auction offer price floor,

$$\text{Net-ACR} + ((\text{Net CONE}/30) * H * (B-A))/365$$

where:

-Net-ACR is the ACR for such resource, less the projected PJM market revenues for such resource, stated in dollars per MW/day of unforced capacity;

-Net CONE the net Cost of New Entry (stated in \$/MW year of unforced capacity) for the geographic region where the capacity resource is located;

-H is the expected value of the number of PAHs;

-B is the average of the Balancing Ratios in the three consecutive calendar years (during the Performance Assessment Hours in such calendar years); and,

-A is the average availability of the capacity resource in the three consecutive calendar years (during the Performance Assessment Hours in such calendar years).

64. In those instances where a capacity resource seller seeks to obtain a unit-specific offer floor price below Net-CONE * B, the application of the EGCR MOPR offer floor price will require careful attention to the calculation of Net-ACR and will need to be monitored and implemented by PJM and PJM's IMM.⁷⁵ This is especially relevant with respect to the AEP and FE PPA Proposals given the link between PPA generating unit performance and capacity market performance financial penalties is severed. Nonetheless, it is imperative that PJM and the IMM review unit-specific capacity market auction floor offer prices in any instance where a EGCR MOPR screened seller requests an offer price below Net-CONE * B.⁷⁶

65. Implementation of a unit-specific offer review process for the EGCR MOPR can be conducted relying on the same PJM and PJM IMM process relied upon now to review unit-specific alternative auction offer caps under PJM's RPM tariff. Because the ACR of PJM capacity resource technologies is tracked and published from year-to-year there is a considerable amount of data available to the IMM that allows

⁷⁵ It would be expected that the timeline could be aligned with the timeline currently used by PJM and the IMM to review unit-specific alternative offer caps.

⁷⁶ In addition, for the 2019/20 capacity auction if an EGCR MOPR screened resource seeks to make a base capacity resource product auction offer coupled with its capacity performance offer, a unit-specific offer floor price will also be calculated and applied to base capacity resource product auction offer. This consideration is only relevant for PJM's 2019/20 capacity auction.

quantification of most of the underlying ACR cost components.⁷⁷ However, two components relevant to the calculation of Net-ACR, Avoidable Project Investment Recovery Rate (“APIR”) and CPQR, are distinctly unique to individual generating units and require special attention in the calculation of the EGCR MOPR. It is imperative that, if a subsidized resource is going to be offered into an RPM auction at a price below Net-CONE * B, these two cost components be carefully evaluated and that those data necessary for the analysis be made available to PJM and the PJM IMM.

66. First, correctly accounting for APIR requires that accurate forecasts of incremental capital investments that may be required to maintain reliable capacity resource operation in the future be provided to the buyers under, in this instance, the PPAs. For example, many of the generating units associated with the AEP and FE PPA Proposals have operated for several decades. It would not be unusual for a generating unit to require an upgrade to the boiler or steam turbine to remain operational under a long-term contract like the PPAs. In particular, because the AEP and FE PPA Proposals create an incentive through the guaranteed ROE for FES and AEP Genco to seek to make additional capital investments, it can be expected that instances will arise where significant incremental capital investment will be necessary. When a future investment is necessary the EGCR MOPR must account for this investment consistent with the provisions under the PJM tariff for the calculation of APIR.
67. Proper accounting and inclusion of APIR ensures that an EGCR MOPR unit-specific floor offer price incorporates expected investment capital cost consistent with how a competitive owner/operator of the capacity resource unit would be expected to develop an offer. This means that if an EGCR MOPR capacity resource requires a significant capital investment to keep the resource operational, an offer will be submitted in the capacity auction that tests whether incremental capital investment in the resource is economically viable. If the generating resource is not accepted in the capacity auction as a result of APIR substantially increasing the Net-ACR, then this is an indication that the generating resource may no longer be cost effective to maintain and operate.⁷⁸
68. Second, the EGCR MOPR must account for the risk of poor resource performance and the potential high costs that could be borne by captive ratepayers in the event of generating unit outages during PAHs. The importance of accounting for the cost of the risk of poor performance can be illustrated by examining how frequently the

⁷⁷ See PJM Open Access Transmission Tariff, Attachment DD.6., Market Power Mitigation, at 6.7 and 6.8(a), Effective Date: 8/25/2015 – Docket#: ER15-2370-000.

⁷⁸ It would be expected under the AEP and FE PPA Proposals that AEP Ohio and the FE Companies would seek to ensure they would be relieved of their PPA payment obligations if a PPA generating unit was obviously uneconomic to maintain.

proposed FES and AEP Genco PPA generating units have been operational and producing at high output levels during PJM periods of high demand (when PAHs are most likely to occur). Exhibit No. AJC-7 presents this generating unit operational analysis for the last nine years, which is the time span over which PJM's RPM auction market has operated.

69. Exhibit No. AJC-7 reports for each of the proposed PPA generating units whether or not the unit was operating during high demand summer and winter periods in PJM, and if the unit was operating, if its output was greater than 75% of the rated capacity.⁷⁹ Exhibit No. AJC-7 clearly demonstrates that the risk of a resource not being operational, or operating below 75% of rated capacity, can be significant. For example, during summer periods of high demand, half of the 28 generating units were not operational in more than 10% of the highest load hours. Moreover, some individual units were not operating during 20-30% of the highest load hours. Although these data do not indicate the circumstances surrounding these generating unit outages, they show that the risk of generating unit non-performance is genuine.
70. Under the RPM capacity performance product structure the cost of non-performance can be significant. Assuming a penalty rate based on an average net-CONE of \$255/MW-Day, or \$3,100/MWh, a large generating unit (e.g., 500 MW) outage that spans two to three days where demand is reaching its highest values for say 15 hours translates into a penalty of over \$23 million. If this unit were receiving capacity revenues based on an auction price of assume \$155/MW-Day, or slightly over \$28 million for the year, it would lose over 80% of its revenues due to a single outage. This risk must be quantified and incorporated into the EGCR MOPR as failing to do so exposes—in this instance—AEP Ohio's and the FE Companies' captive ratepayers to this substantial financial burden.⁸⁰
71. Moreover, the EGCR MOPR offer floor price must specifically take into account that the risk of poor capacity resource performance has been shifted from a competitive capacity resource owner/operator to entities that have little or no incentive to manage the risk (and ultimately to retail customers who have no ability to manage that risk). Under the AEP and FE PPA Proposals the generation unit owners have no contractual incentive to maintain the generating units to minimize the costs of capacity performance risk (see Section II). In this instance, this means that all risk of poor unit performance falls upon AEP Ohio and the FE Companies and given their business expertise is not operation, maintenance, and investment in electric generating plants there is no reason to expect that they can effectively manage this risk. In addition, the

⁷⁹ In the analysis the high demand periods are defined as the highest 20 hours of load in both the winter and summer seasons. Thus, the analysis examines 40 hours for each year.

⁸⁰ If a generating unit were to experience a major outage the maximum performance penalty is 1.5 times net-CONE, which means a penalty three times what is estimated in this example.

ability for AEP Ohio and the FE Companies to diversify this risk (e.g., through insurance or other financial instruments) is severely limited as they are not in the power generation business and under the PPAs are not in a position to tell the FES and AEP Genco how to conduct their business. The EGCR MOPR floor offer price must reflect the increased performance risk associated with the PPAs and the inability of AEP Ohio and the FE Companies to manage effectively this risk.

72. Because of the unique circumstances associated with the FE and AEP PPA Proposals (and which could exist under other similar contractual arrangements), the calculation of the CPQR for each of the PPA generating units requires the application of specific principles. First, the calculation of the CPQR for the EGCR MOPR must recognize that the techniques described for calculating the CPQR by the PJM IMM are unlikely to be directly applicable to generating units subject to out-of-market PPAs.⁸¹ Second, the CPQR for the EGCR MOPR must directly account for the substantial financial risk of non-performance for each individual generating unit to which it will apply. Third, in the absence of evidence that the cost of the risk of non-performance is accounted for directly by the buyers under the PPAs, the greatest financial exposure of non-performance should be applied when calculating the CPQR for the EGCR MOPR.
73. The first principle for calculating the CPQR is necessary to account for the likely shift in the management of generation unit performance risk from a generation unit owner/operator to an affiliated buyer that can place this financial burden on captive ratepayers. In this instance it cannot be assumed that the buyer under a PPA can, or will, take those actions necessary to minimize the financial consequences of poor generating unit performance. Under the framework put forth by the IMM for calculation of the CPQR, it is assumed that the capacity resource owner directly evaluates the risks of non-performance and carefully assesses the impact of capacity performance product financial exposure due to uncertainties associated with forecasting future performance. Within this framework it may be relevant to consider past performance as an indicator of future performance. However, if the linkage between evaluating the cost of the risk of financial penalty for poor performance and the benefits of taking actions to ensure strong generating unit performance is broken, it is no longer the case that historical performance data is reliable. In fact, the example of the AEP and FE PPA Proposals completely removes bearing the cost of this risk from FES and AEP Genco and portends a higher likelihood of declining future generating unit performance.⁸² Thus, the calculation of CPQR for the EGCR

⁸¹ See IMM Answer at Appendix B.

⁸² Although there are countervailing incentives under the AEP and FE Proposals to seek to increase capital investment in the PPA generating units, this does not necessarily mean that the cost of the risk of generating performance will be more effectively managed given the lack of financial responsibility for non-performance.

MOPR requires consideration of the extreme financial consequences borne by captive ratepayers in the event of generating unit non-performance.

74. The second principle for calculation of the CPQR for the EGCR MOPR recognizes that each capacity resource subject to the floor offer price must be evaluated individually. Because an electric generation facility may have multiple individual capacity resources, it may be argued that it is appropriate to link the CPQR calculation for one particular capacity resource with another resource under the presumed assumption that an outage at one unit can be compensated for by the increased operation of another unit. However, the ability to forecast that multiple capacity resource operations at a single facility during a PAH will provide a hedge against performance penalties is highly speculative. In fact, it may be more likely that multiple capacity resources at a large facility share certain balance of plant operational support services whose failure could cause more than one unit to sustain an outage simultaneously. Each individual resource subject to the EGCR MOPR requires a unit-specific CPQR.
75. Finally, the third principle recognizes the possibility that the cost of the risk being borne by the buyer under the PPA (or contract) may be able to be managed through some form of insurance or financial hedging arrangement. To the extent the cost of the risk can be quantified, it is appropriate to take the cost directly into account when calculating the CPQR for the EGCR MOPR.

C. An Effective EGCR MOPR is Critical

76. Guarding against uneconomic subsidization of existing units is just as critical as guarding against uneconomic new entry. PJM's wholesale power markets are guiding efficient capacity resource addition and retirement decision making by capacity resource owners and developers. Capacity resource investment and retirement decisions are a function of a number of important long-term considerations and distorted capacity market prices will interfere with efficient decision making. It is imperative that an effective EGCR MOPR be approved by the Commission. An effective EGCR simply prevents unwarranted financial subsidization of particular capacity resources at the expense of all others from distorting power market prices. I recommend that the Commission approve the proposed EGCR MOPR.

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

**Calpine Corporation, Dynegy Inc., Eastern
Generation, LLC, Homer City Generation,
L.P., NRG Power Marketing LLC, GenOn
Energy Management, LLC, Carroll County
Energy LLC, C.P. Crane LLC, Essential
Power, LLC, Essential Power OPP, LLC,
Essential Power Rock Springs, LLC,
Lakewood Cogeneration, L.P., GDF SUEZ
Energy Marketing NA, Inc., Oregon Clean
Energy, LLC and Panda Power Generation
Infrastructure Fund, LLC,**

Docket No. EL16-____-000

Complainants,

v.

PJM Interconnection, L.L.C.,

Respondent.

AFFIDAVIT

A. Joseph Cavicchi, being duly sworn, deposes and states that the statements contained in the foregoing Affidavit of A. Joseph Cavicchi are true and correct to the best of his knowledge and belief.

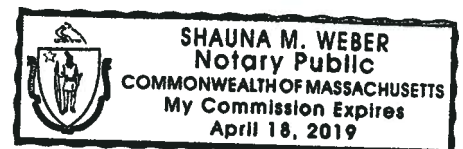

A. Joseph Cavicchi

Subscribed and sworn to before me
this 21st day of March, 2016



Notary Public for the Commonwealth of Massachusetts

My Commission expires: April 18th, 2019



POWER PURCHASE AND SALE AGREEMENT

by and between

~~GENCO~~

AEP GENERATION RESOURCES INC.

and

OHIO POWER COMPANY

dated as of

_____, ~~2014~~2016

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POWER PURCHASE AND SALE AGREEMENT

THIS POWER PURCHASE AND SALE AGREEMENT (this “Agreement”), dated as of _____, ~~2014~~, 2016, is by and between ~~[GenCo]~~ AEP Generation Resources Inc., a Delaware corporation (“Seller”), and OHIO POWER COMPANY, an Ohio corporation (“Buyer”). Buyer and Seller are sometimes referred to herein individually as a “Party” and collectively as the “Parties.”

RECITALS

A. Seller, an indirect subsidiary of American Electric Power Company, Inc., with its principal place of business in the State of Ohio, owns or will have an ownership interest in the Ohio based generation facilities shown in Schedule A entitled Ohio Generation Facilities.

B. The Parties desire to enter into a transaction in which Seller sells and Buyer purchases the Capacity, and associated Unit Contingent Energy and Ancillary Services, as delivered or made available from Seller’s ownership interest in the generation facilities in Schedule A for ~~a term through the remaining commercial operational life of each of the Schedule A Generation Facilities~~ the Delivery Period.

C. The Parties desire to set forth certain terms and conditions applicable to such transaction.

In consideration of mutual covenants and agreements contained herein, the Parties agree as follows:

ARTICLE I

DEFINITIONS

1.1 Defined Terms. Unless otherwise defined herein, the following terms, when used herein, shall have the meaning set forth below:

“Affected Party” has the meaning set forth in Section 3.7.

“Affiliate” means, with respect to any Person, any other Person (other than an individual) that, directly or indirectly, through one or more intermediaries, controls, or is controlled by, or is under common control with, such Person. For this purpose, “control” means the direct or indirect ownership of fifty percent (50%) or more of the outstanding capital stock or other equity interests having ordinary voting power.

“Agreement” means this Power Purchase and Sale Agreement entered into pursuant to Seller’s market based rate authority.

“Allowance Transfer Deadline” means the date by which Allowances must be submitted for recordation with the EPA or other relevant Governmental Authority in order to

meet the applicable Allowance obligation for the control period immediately preceding that deadline.

“Allowances” means emission allowances, emission credits, and any similar rights related to emissions of NO_x, SO₂, CO₂, mercury, particulates or any other substance under any relevant federal, state or local law or recognized by any Governmental Authority or other entity, and all other environmental attributes.

“Ancillary Services” means regulation and frequency response services; energy imbalance services; automatic generating control services; spinning, non-spinning, supplemental and replacement reserve services, reactive power and voltage support services, black start services and all other services or products ancillary to the operation of the Facility that are defined as ancillary services in the Transmission Operator’s relevant transmission tariff or are commonly sold or saleable, to the extent that the assets comprising the Facilities provide those services or products.

“Approvals” means all approvals, permits, licenses, consents, waivers or other authorizations from, notifications to, or filings or registrations with, third parties, including without limitation, Governmental Approvals.

“Business Day” means any day except a Saturday, Sunday, or a United States Federal Reserve Bank holiday. A Business Day shall open at 8:00 a.m. and close at 5:00 p.m. local time at the relevant Party’s principal place of business. The relevant Party, in each instance unless otherwise specified, shall be the Party from whom the notice, payment or delivery is being sent and by whom the notice or payment or delivery is to be received.

“Buyer” has the meaning set forth in the preamble hereto.

“Buyer’s Contractual Capacity” means Seller’s Capacity of the Facilities identified in Schedule A subject to the applicable Facility Operating Agreement, which entitlement is approximately 2,671 MW as of the date set forth in the preamble to this Agreement.

“Capacity” means the output level, expressed in MW, that a Facility, or the components of equipment thereof, is capable, as of a given moment, of continuously producing and making available at the Delivery Point, taking into account the operating condition of the equipment at that time, the auxiliary loads, the Facility Operating Agreement and other relevant factors.

“Capital Improvements Work” shall mean (i) for wholly owned Seller Facilities, the modeling, studying, engineering, design, procurement, purchasing, construction, inspection, start-up and testing of (a) minor or non-material capital improvements, replacements, repairs or additions to the Facility (b) mutually agreed to costs by both Buyer and Seller for any major or material capital improvements, replacements, repairs or additions to the Facility or (ii) for Seller Facilities that are jointly owned, capital improvements, replacements, repairs or additions to the Facility.

“Capacity Payment” has the meaning set forth in Section 5.5.

“Cardinal Station Agreement” means the agreement, dated as of January 1, 1968, by and between the Seller, Buckeye Power, Inc. and Cardinal Operating Company, including all amendments and any future amendments thereto.

“Change-in-Law” means, after the date set forth in the preamble to this Agreement, the adoption, imposition, promulgation, change in interpretation or modification by a Governmental Authority of any law, regulation or Governmental Approval, or the issuance of a final and non-appealable order, judgment, award or decree of a Governmental Authority having the effect of the foregoing.

“Change-in-Law Taxes” means, after the date set forth in the preamble to this Agreement, any change (increase or decrease) in Taxes imposed on Seller on (a) the sale or use of fuel for generation of electricity, (b) the sale of Capacity or (c) the production or sale of Energy or Ancillary Services, in any case, resulting from a Change-in-Law.

“Claims” means all claims or actions, threatened or filed and, whether groundless, false, fraudulent or otherwise, that directly or indirectly relate to the subject matter of an indemnity, and the resulting losses, damages, expenses (including reasonable attorneys’ fees and disbursements) and court costs, whether incurred by settlement or otherwise, and whether such claims or actions are threatened or filed prior to or after the termination of this Agreement.

“Closing” and **“Closing Date”** means the date upon which the Parties obtain all regulatory approvals for this Agreement.

“Contract Price” means the price to be paid by Buyer to Seller for the purchase of the Buyer’s Contractual Capacity and associated Energy and Ancillary Services, as determined in accordance with the provisions of Article V.

“Contract Year” means the period beginning at 12:01 a.m. EPT on the Start Date and ending on December 31st of the same year, and each succeeding calendar year thereafter during the Delivery Period. If the first or last Contract Year consists of a shorter period than a full calendar year, including by reason of the termination of this Agreement prior to the expiration of the Delivery Period, then that Contract Year may consist of a shorter period than a full calendar year, in which case with respect to that Contract Year, all terms and provisions of this Agreement that refer to or are based on a Contract Year shall be adjusted ratably downward to reflect such shorter period.

“Delivery Period” has the meaning set forth in Section 2.2.

“Delivery Point” has the meaning set forth in Section 3.4.

“Depreciation Payment” has the meaning set forth in Section 5.4.

“Effective Date” means the date on which all of the conditions precedent set forth in Section 11.1 have been satisfied or waived, which date shall not be earlier than the Closing Date.

“End Date” has the meaning set forth in Section 2.2.

“Energy” means three-phase, 60-cycle alternating current electric energy, expressed in MWh.

“EPA” means the United States Environmental Protection Agency or any successor agency with similar jurisdiction.

“EPT” or **“Eastern Prevailing Time”** means the local time at the geographical location of the Delivery Point.

“Equitable Defenses” means any bankruptcy, insolvency, reorganization and other laws affecting creditors’ rights generally, and with regard to equitable remedies, the discretion of the court before which proceedings to obtain same may be pending.

“Facility” means any unit identified on Schedule A entitled Ohio Generation Facilities.

“Facility Operating Agreement” means the applicable operating agreement(s) by and among Seller and the other co-owners thereto, as amended or supplemented from time to time, and shall include all exhibits, schedules and annexes thereto, and, for purposes of Section 10.5, such term shall be deemed to include all other agreements, documents, certificates and instruments to which Seller is a party with respect to or in connection with a Facility, as the same may be supplemented or amended from time to time. Upon execution and delivery of this Agreement, Seller will, to the extent not already in the possession of Buyer, deliver to Buyer a true and correct copy of the operating agreement(s) as of that date, including any amendments thereto.

“Facilities” means the generation facilities or units on Schedule A entitled Ohio Generation Facilities.

“Facility LMP Point” means the location at each Facility recognized by the PJM’s scheduling and settlement systems.

“FERC” means the Federal Energy Regulatory Commission or any successor entity with similar jurisdiction.

“Force Majeure” means an event or circumstance which prevents one Party from performing its obligations under this Agreement, which event or circumstance was not reasonably anticipated as of the date set forth in the preamble to this Agreement, which is not within the reasonable control of, or the result of the negligence of, the Affected Party, and which, by the exercise of due diligence, the Affected Party is, by using reasonable efforts, unable to overcome or avoid or cause to be avoided. Force Majeure shall not be based on (a) Seller’s ability to sell Seller’s Capacity Entitlement or associated Energy or Ancillary Services at a price greater than the Contract Price; (b) the loss of Buyer’s markets; or (c) a Party’s inability economically to purchase, use, sell or resell fuel, equipment or services or the Capacity, Energy or Ancillary Services purchased hereunder. Force Majeure includes events of “Force Majeure” as defined in a Facility Operating Agreement, to the extent excusing the performance of the Facility operator or the other joint owners thereto from their obligations under that agreement, but only to the extent affecting the Parties’ performance under this Agreement.

“Fuel Costs” means without limitation, all fixed or variable costs, expenses, losses, gains, liabilities, fuel hedging, claims and charges related to the acquisition, sale, storage, inventory, transloading, handling, balancing and transportation and delivery of fuel and all expenses recorded to FERC accounts 501 and 502 including, without limitation, coal, natural gas, diesel fuel, oil, consumables, chemicals, trona, urea, limestone, lime hydrated lime, ammonium carbonate, activated carbon, ash, scrubber waste, plant waste and gypsum disposal expense and sales credits, emission Allowance expenses (including all Allowance expenses recorded in Account 509, along with gains/losses in Accounts 411.8 and 411.9), for the Schedule A Generation Facilities, including related costs of credit,

“Fuel Payment” has the meaning set forth in Section 5.2.

“Governmental Approval” means any permit, authorization, registration, consent, action, waiver, exception, variance, order, judgment, decree, license, exemption, publication, filing, notice to, or declaration of or with, or required by any Governmental Authority or applicable law.

“Governmental Authority” means any federal, state, tribal, local, or municipal government body; and any governmental, regulatory, or administrative agency, commission, body, agency, instrumentality, or other authority exercising or entitled to exercise any executive, judicial, legislative, administrative, regulatory, or taxing authority or power, including any court or other tribunal.

“Imbalance Charges” means any penalties, fees or charges assessed by a Transmission Operator or Transmission Provider for failure to satisfy requirements for balancing of electric energy receipts and deliveries or loads and generation, or payable to any other Person in connection with the delivery of electrical energy in an amount(s) different from the amount(s) scheduled.

“Income Tax” means any Tax imposed by any Taxing Authority (i) based upon, measured by or calculated with respect to gross or net income, profits, commercial activity, or receipts (including municipal gross receipt Taxes, capital gains Taxes and minimum Taxes) or (ii) based upon, measured by or calculated with respect to multiple bases (including corporate franchise Taxes) if one or more of such bases is described in clause (i), in each case together with any interest, penalties or additions attributable to such Tax.

“Indemnified Parties” has the meaning set forth in Section 13.2.

“Letter(s) of Credit” means one or more irrevocable, unconditional, transferable standby letters of credit issued by a major U.S. commercial bank or the U.S. branch office of a foreign bank with, in either case, a Credit Rating of at least (a) “A-” by S&P and “A3” by Moody’s, if such entity is rated by both S&P and Moody’s or (b) “A-” by S&P or “A3” by Moody’s, if such entity is rated by either S&P or Moody’s but not both, in a form acceptable to the Party in whose favor the Letter of Credit is issued. Costs of a Letter of Credit shall be borne by the applicant for such Letter of Credit.

“Mobile-Sierra Doctrine” has the meaning set forth in Section 13.13.

“Monthly Payment” has the meaning set forth in Section 5.1.

“Moody’s” means Moody's Investors Services, Inc. or its successor.

“MW” means megawatt.

“MWh” means megawatt-hour.

“NERC” means the North American Electric Reliability Corporation or any successor entity with similar jurisdiction.

“O&M Payment” has the meaning set forth in Section 5.3.

“Operation and Maintenance Costs” means all fixed or variable costs, expenses, losses, liabilities, claims, charges and associated credits incurred directly or indirectly in the performance of Operating Work, including a ratable portion of retirement costs, but not including Fuel Costs.

“Operating Work” means the operation, maintenance, use, repair or retirement of a Facility on or after the Start Date, including but not limited to labor; parts; supplies; insurance; permits; related taxes; community relations; procurement of ancillary services, fuel and other consumables; fuel acquisition or sales, transportation balancing and storage; waste handling and disposal; filing, defense and settlement of claims, suits and causes of action; procurement (or sale) of Allowances and settlement of all other environmental charges (or credits) pertaining to the operation of a Facility; but excluding any Capital Improvements Work.

“Outage” shall mean any unavailability, in whole or in part, of the Facility whereby it is not capable of fully operating at its rated capability due to (i) a forced derating, Forced outage maintenance derating, maintenance outage, planned derating, planned outage, (all as defined in the NERC Generating Unit Availability Data System (“**GADS**”) Data Reporting Instructions); (ii) the actual or anticipated failure of component(s); (iii) external restrictions; (iv) testing; (v) work being performed; (vi) maintenance; (vii) construction, or (viii) any other condition or circumstance that reduces electrical generating output from time to time from the Facility so as to prevent Seller from performing its obligations in whole or in part.

“Party” has the meaning set forth on the preamble hereto.

“Performance Assurance” means collateral in the form of Cash, Letter(s) of Credit, or other security or assurances acceptable to the Requesting Party.

“Person” means any individual, corporation, partnership, limited liability company, other business organization of any kind, association, trust, or governmental entity, agency or instrumentality.

“PJM” means the PJM Interconnection, LLC or any successor entity with similar responsibilities.

“Property Tax” means any Tax resulting from and relating to the assessment of real or personal property by any Taxing Authority.

“Seller” has the meaning set forth in the preamble hereto.

“Seller’s Debt Percentage” or **“DP”** means for purposes of this Agreement the percentage of 50%.

“Seller’s Equity Percentage” or **“EP”** means for purposes of this Agreement the percentage of 50%.

“Seller’s Facilities Net Book Value” or **“FNBV”** means the net book value of the Facilities as reflected on the books and records of Seller immediately prior to the Contract Year, and including all electric plant in service and capital lease assets net of accumulated depreciation and other investment (e.g. fuel and materials and supplies inventories, prepayments, plant held for future use, working capital, construction work in progress (“CWIP”), asset retirement obligations including ash pond closure costs, other deferred credits and accumulated deferred taxes).

“Seller’s Long Term Debt Rate” or **“LTDR”** means from ~~June 1, 2015~~ the Start Date through December 31, ~~2016~~ 2017 an initial rate of 4.73%. Thereafter, starting on January 1, ~~2017, 2018~~, it will be Seller’s average annual cost of long-term debt (i.e., debt having maturities of greater than twelve calendar months) as reflected on Seller’s books and records as of the relevant determination date, updated as of January 1st of each calendar year thereafter, or updated at more frequent intervals as reasonably determined by Seller.

“Seller’s Return on Equity” or **“ROE”** means ~~Seller’s post-tax rate of return on equity, which amount will equal, for each Contract Year, the average of the daily Moody’s Long Term Baa Corporate Bond Index for the month of December of the preceding calendar year, plus 650 basis points; provided, however, such amount not to be less than 8.90% or greater than 15.90%~~ 10.38%, for each Contract Year.

“Seller’s Weighted Average Cost of Capital” or **“WACOC”** has the meaning set forth in Section 5.5.

“Start Date” has the meaning set forth in Section 2.2.

“Straddle Period” means, as appropriate, either any Tax Period beginning before the beginning of the first Contract Year and ending either during or as of the end of the first Contract Year or any Tax Period that is longer than one month. For example, pursuant to Section 8.5, the Tax Period for Property Taxes is each calendar year. Hence, the Tax Period for Property Taxes is a Straddle Period.

“Tax” or **“Taxes”** means any federal, state, local, or foreign income, commercial activity, gross receipts, value added, windfall or other profits, alternative or add-on minimum, estimated, franchise, profits, sales, use, real property, personal property, ad valorem, vehicle, airplane, boat, license, payroll, employment, workers’ compensation, unemployment compensation, withholding, social security, disability, excise, severance, stamp, occupation, premium,

environmental (including taxes under Code section 59A or any cost, charge or other financial burden on emissions), carbon dioxide, other greenhouse gases, charges on consumption, transportation or use of energy from such sources, customs duties, import fees, capital stock transfer, title, documentary, or registration, or other tax, duty, or impost of any kind whatsoever, whether disputed or not, and on either side of the Delivery Point. “Taxes” includes (i) any liability for the payment of any amounts described in the preceding sentence as a result of being a member of an affiliated, consolidated, combined, or unitary group for any taxable period, (ii) any liability for the payment of any amount described in clause (i) above as a result of being a Person required to withhold or collect Taxes imposed on another Person, (iii) any liability for the payment of any amount described in the preceding sentence or in clause (i) or (ii) of this sentence as a result of being a transferee of, or successor in interest to, any Person or as a result of an express or implied obligation to indemnify any Person, and (iv) any and all interest, penalties, additions to tax, or additional amounts imposed in connection with or with respect to any amount described above in this definition.

“**Taxing Authority**” shall mean, with respect to any Tax, the governmental entity (national, local, municipal or otherwise) or political subdivision thereof that imposes such Tax, the agency (if any) charged with the collection of such Taxes for such entity or subdivision, including any governmental or quasi-governmental entity, a council (if any) or agency that imposes, grants or monitors Taxes or the abatements thereof, or is charged with collecting social security or similar charges or premiums.

“**Tax Period**” means the time period for which or during which a Tax is imposed by any Taxing Authority.

“**Tax Reimbursement Payment**” has the meaning set forth in Section 5.6.

“**Term**” has the meaning set forth in Section 2.1.

“**Transmission Operator**” means PJM or any Transmission Provider, independent system operator, regional transmission operator or other transmission operator from time to time having authority to control the transmission control area to which the Facility is interconnected.

“**Transmission Provider**” means any Person or Persons that owns, operates or controls facilities used for the transmission of electrical energy in interstate commerce.

“**Unit Contingent**” or reference to “**Unit Contingency**” means, with respect to Energy or Ancillary Services associated with Buyer’s Contractual Capacity, that such Energy or Ancillary Services are intended to be supplied from the Facility and Seller’s failure to deliver such Energy or Ancillary Services is excused to the extent the Facility (including all facilities on Seller’s side of the Delivery Point) is unavailable as a result of (i) an Outage, (ii) Force Majeure or (iii) Buyer’s failure to perform.

1.2 Interpretation. Unless the context otherwise requires:

- (a) Words singular and plural in number will be deemed to include the other and pronouns having masculine or feminine gender will be deemed to include the other.

- (b) Any reference herein to any Person includes its successors and permitted assigns and, in the case of any Government Authority or Taxing Authority, any Person succeeding to its functions and capacities.
- (c) Any reference herein to any Article, Section, clause, or schedule means and refers to the appropriate Article, Section or clause or schedule in this Agreement.
- (d) Other grammatical forms of defined words or phrases have corresponding meanings.
- (e) The term “including” when used in this Agreement means “including without limitation.”
- (f) Unless otherwise specified, a reference to a specific time for the performance of an obligation is a reference to that time in the place where that obligation is to be performed.
- (g) A reference to a document or agreement, including this Agreement, includes all appendices and schedules thereto.
- (h) A reference to a document or agreement, including this Agreement, includes a reference to that document or agreement as amended, supplemented, amended and restated or otherwise modified from time to time.
- (i) If any payment, act, matter or thing hereunder would occur on a day that is not a Business Day, then such payment, act, matter or thing shall, unless otherwise expressly provided for herein, occur on the next succeeding Business Day.
- (j) The words “hereof,” “hereunder,” “herein,” “herewith,” and “hereto,” and similar words refer to this Agreement as a whole and not to any particular Article, Section or clause in this Agreement.

1.3 Technical Meanings. Words not otherwise defined herein that have well-known and generally accepted technical or trade meanings are used herein in accordance with such recognized meanings, as of the date set forth in the preamble to this Agreement.

ARTICLE II

TERM

2.1 Term. The term of this Agreement (“**Term**”) shall commence on the date set forth in the preamble to this Agreement and shall continue, unless earlier terminated in accordance with the provisions of this Agreement, until the End Date.

2.2 Delivery Period. Subject to Section ~~2.3~~ or Section 2.4, 2.3, the period during which the Parties will be obligated to purchase and sell Capacity, Energy and Ancillary Services as set forth in this Agreement (“**Delivery Period**”) will commence on ~~June 1, 2015,~~ 2016, or such other earlier date as may be jointly specified by the Parties (“**Start Date**”), and run

through ~~the conclusion of the commercial operational life of the generation facilities listed on Schedule A, including any post-retirement period to complete all asset retirement obligations and any other removal projects~~ May 31, 2024 (“End Date”), unless the Parties otherwise mutually agree in writing upon an alternative End Date.

2.3 Early Termination Right. Subject to Buyer complying with its obligations under Article V and provided Buyer is not a Defaulting Party, Buyer will have on or after the first anniversary of the Start Date, the right, but not the obligation, upon no less than three hundred and sixty five (365) days notice to Seller to terminate, in whole, this Agreement prior to the End Date if retail cost recovery for Buyer’s costs hereunder is discontinued ~~or substantially diminished, including through a one-time significant disallowance for retail rate recovery of costs by the Commission~~.

~~2.4 Other Early Termination Rights. In the event the Parties are unable to reach agreement upon the retirement date of a Unit or Facility, the Parties may mutually agree to remove such Unit or Facility from this Agreement, subject to Buyer complying with its obligations under Article V.~~

ARTICLE III

PURCHASE AND SALE OBLIGATION

3.1 Seller’s and Buyer’s Obligations. Subject to, and in accordance with, the terms and conditions of this Agreement, Seller agrees to sell and deliver, and Buyer agrees to purchase, receive, and pay for, Buyer’s Contractual Capacity and the Energy and Ancillary Services associated with Buyer’s Contractual Capacity delivered by Seller to the Delivery Point during each hour of the Delivery Period.

3.2 Unit Contingent. All Energy and Ancillary Services associated with Buyer’s Contractual Capacity and all of Seller’s obligations to sell and deliver the Energy and Ancillary Services associated with the Buyer’s Contractual Capacity are Unit Contingent.

3.3 Fuel. During the Delivery Period, Seller will arrange, provide, procure, supply, manage, transact, transport and deliver Fuel to Facilities where Seller performs this function, and at all remaining Facilities, Seller will provide input to the plant operator on Fuel purchases and Fuel related matters for such Facility. Buyer will have the rights to monitor the Fuel procurement and logistics process and provide reasonable direction on the activity to the Seller at Operating Committee Meetings. When Seller needs to acquire Fuel on behalf of Buyer, Seller agrees to conduct such purchases of Fuel, whenever reasonably possible, using competitive methods, including, without limitation, requests for proposals, and Buyer will have the right, but not the obligation, to observe, monitor, and approve the results of such competitive methods. Excluding emergency situations, Fuel procurements not purchased through competitive methods must first be approved by Buyer. Any fuel purchase contracts used to supply fuel to the Facilities that are in effect prior to and extend beyond the Start Date will continue to be utilized for the Facilities. Buyer acknowledges and agrees that existing contracts entered into prior to the Start Date will continue to be utilized to supply fuel to Seller’s generation covered by this Agreement and if any such fuel is also utilized to supply fuel to Seller’s generation that is not part of this Agreement

the allocation of such fuel between the Facilities and the Seller's other units will be performed in an equitable manner approved by both the Seller and the Buyer. Any such pre-existing contracts will not be renewed or extended to serve the Facilities covered by this Agreement unless approved by the Buyer.

3.4 Delivery Point. The Delivery Point for Energy and Ancillary Services associated with Buyer's Contractual Capacity will be the location of the PJM node at each facility, typically located at the high side of the transformers located at each of the generating facilities identified in Schedule A, at which point the quantities of such Energy or Ancillary Services delivered by Seller to Buyer will be recorded and measured by the relevant revenue meters.

3.5 Scheduling and Dispatch. Buyer or its agent will dispatch the generation associated with the Facilities by reviewing and determining the parameters associated with PJM generation offers, including how such generation will be offered to PJM, for the Energy and Ancillary Services associated with Buyer's Contractual Capacity and Seller will, subject to the requirements of PJM and the operating parameters of the Facilities, as determined by the Facility operator, operate and control the Facilities and schedule with PJM pursuant to Buyer's dispatch criteria and PJM's requirements and instructions. Buyer acknowledges and agrees that it will be obligated at all times to receive Seller's allocation of minimum output of a Facility, consistent with unit operation limitations and any Facility Operating Agreement. Schedules will be adjusted to the extent necessary to allow Seller or the Facility operator to start-up, operate, curtail or shut-down any of the Facilities as required to comply with instructions from the Transmission Operator. Seller will cooperate and provide any assistance to Buyer so that Buyer can determine how such generation will be offered to PJM. Buyer will be allocated any excess (or deficit) amount of Energy or Ancillary Services made available by Seller at the Delivery Point over (or under) the amount of Energy or Ancillary Services Scheduled by the Buyer. Buyer will be responsible for all Imbalance Charges associated with the Energy made available to it by Seller at the Delivery Point, provided, however, that any such Imbalance Charges resulting from Seller's unexcused failure to dispatch, or to cause the Facility operator to dispatch, the Energy associated with the Seller's Capacity Entitlement that are designated by Buyer will be the responsibility of the Seller. The Energy and Ancillary Services associated with Buyer's Contractual Capacity will be recorded by the Parties in PJM's scheduling and settlement systems at the Facility LMP Point.

3.6 Transmission And Related Costs. Seller shall make all Energy and Ancillary Services associated with Seller's Capacity Entitlement available to Buyer at the Delivery Point. Buyer shall be responsible for transmission service at and from the Delivery Point and shall coordinate, as necessary, for scheduling services with the Transmission Operator to receive all Energy and Ancillary Services associated with the Seller's Capacity Entitlement at the Delivery Point. Buyer shall have the right to designate an agent for coordinating, as needed, with PJM related to the Capacity, Energy and Ancillary Services received under this Agreement. Buyer shall be responsible (i) for all costs or charges imposed on or associated with the Seller's Capacity Entitlement and associated Energy and Ancillary Services and the delivery of all Energy and Ancillary Services associated with the Seller's Capacity Entitlement at and after the Delivery Point, and (ii) for any and all Imbalance Charges consistent with Section 3.5. Subject to reimbursement as set forth in Article IV, Seller shall be responsible for all costs or charges imposed on or associated with the Seller's Capacity Entitlement and associated Energy and

Ancillary Services and the delivery of all Energy and Ancillary Services associated with the Seller's Capacity Entitlement up to the Delivery Point.

3.7 Force Majeure. To the extent either Party is prevented by Force Majeure from carrying out, in whole or part, its obligations under this Agreement (other than an obligation to pay money), and such Party (the "**Affected Party**") gives notice and details of the Force Majeure to the other Party as soon as practicable (but not later than thirty (30) days thereafter to the extent such details are then available) then the Affected Party shall be excused from the performance of its obligations under this Agreement (other than the obligation to make payments) so long as the Affected Party shall be using all reasonable efforts to overcome the Force Majeure and resume performance as soon as possible. The non-Affected Party shall not be required to perform or resume performance of its obligations (excluding payment obligations) to the Affected Party corresponding to the obligations of the Affected Party excused by Force Majeure, until such time and to the extent the Affected Party resumes its performance.

3.8 Allowances. Seller shall separate the Allowance inventories associated with the Facilities and maintain them in a separate subaccount for Buyer's benefit. To the extent Seller has any Allowances prior to the Start Date that are not associated with the Facilities or any of the Seller's other generation units, such Allowances will be allocated to Buyer's separate subaccount and the Seller's other Allowance subaccounts based on the emissions of the applicable units over the 5 prior calendar years. The applicable units will be all the units required to provide Allowances for its emissions, excluding any units retired prior to the Start Date. Following the Start Date, the subaccount established for Buyer shall be used to record all Allowances arising from or associated with a Facility that Seller is granted or to which it is entitled for the Delivery Period, within thirty (30) days of such grant or other effective date, whether such grant or entitlement is made on a one-time, annual or other periodic basis. Allowances will be removed from the subaccount established for Buyer as needed to comply with surrender requirements associated with any applicable emissions from the Facilities by the Allowance Transfer Deadline, and the associated Allowance expense will be borne by the Buyer. Buyer shall manage all Allowances in the subaccount established for Buyer, including the purchasing, selling or other disposition of the Allowances and will receive any gains or any losses associated with such management.

3.9 Failure to Deliver Energy/Ancillary Services. If Seller fails to or Seller fails to cause the Facility operator under the Facility Operating Agreement to Schedule, Dispatch and/or deliver all or any part of the Energy and/or Ancillary Services that are Scheduled and Dispatched by Buyer pursuant to this Agreement and it is not the result of an Outage or a Force Majeure, Seller shall pay Buyer an amount equal to the sum of (a) the positive difference, if any between the Contract Price of the Energy and/or Ancillary Services to be supplied by Seller and (b) the price for a corresponding amount of replacement Energy and/or Ancillary Services.

3.10 Consent Decree. Due to certain of the Facilities being subject to the Consent Decree between U.S. EPA and Ohio Power Company entered on December 10, 2007 and as issued in Civil Action No. C2-99-1182 and consolidated cases by the United States District Court for the Southern District of Ohio, Eastern Division, as modified from time to time ("Consent Decree"), Seller will constrain the dispatch of impacted Facilities if or when needed to ensure compliance with any emission limitations required by the Consent Decree. Such limitations will

be reasonably economically imposed and applied on a consistent basis between the Agreement Facilities and other generating units of the Seller that are not part of this Agreement. Buyer shall bear the full cost of any fines or penalties resulting from non-compliance with any resulting emission limitations of the Agreement Facilities associated with Buyer's rights to dispatch the Facilities hereunder. Seller shall bear the full cost of any fines or penalties resulting from Seller's failure to constrain the use of impacted Facilities needed to ensure compliance with any emission limitations required by the Consent Decree.

3.11 Cardinal Station Agreement. Buyer acknowledges and agrees that Buyer's entitlements and obligations under this Agreement shall be subject to, conditioned upon, and net of all the entitlements and obligations of Buckeye under the Cardinal Station Agreement related to capacity, energy and ancillary service entitlements and back-up obligations. Accordingly, Buyer shall provide for Buckeye's use and bear all of the net cost of providing all such entitlements directly to Buckeye or to Seller for Buckeye's benefit. Consistent with Section 3.5, the Buckeye's Units shall be dispatched and the Buyer shall receive the corresponding capacity, energy and ancillary service revenues, net of any applicable costs, as described under and subject to the Cardinal Station Agreement. During the Delivery Period, Seller shall not agree to any amendment, waiver or other modification of the Cardinal Station Agreement without obtaining the prior written consent of Buyer. ~~During~~For the balance of the 2015/2016 Planning Year from the Start Date, Seller will credit to Buyer Capacity revenues associated with Buckeye's Units in an amount equal to the Capacity revenues of the Facilities that have been provided to Buckeye for that Planning Year.

ARTICLE IV

FACILITY OPERATIONS

4.1 Operation and Maintenance. At all times during the Delivery Period, Seller shall perform the Operating Work, or cause the Operating Work to be performed, in accordance with good commercial and prudent utility practice consistent with the procedures employed by Seller at similar generating stations or the procedures followed by the operator of units that are not wholly owned by Seller. Subject to reimbursement as set forth in Article V, Seller shall be responsible for all costs, expenses, losses, liabilities and charges incurred by it, or on its behalf, in the performance of Operating Work, including the procurement of Ancillary Services sufficient to satisfy Ancillary Service obligations to the Transmission Operator related to the Facility.

4.2 Capital Improvements. From time to time during the Term, Seller shall perform, or cause to be performed, Capital Improvements Work related to a Facility. For major or material projects at a wholly owned Seller Facility, Buyer's prior written approval and agreement must first be obtained before proceeding with such Capital Improvements Work. For a unit at a Facility that is jointly owned, Seller will obtain and communicate to the third party operator Buyer's input on any Capital Improvements Work proposed. Subject to reimbursement as set forth in Article V, Seller shall be responsible for all costs, expenses, losses, liabilities and charges incurred by it, or on its behalf, in the performance of Capital Improvements Work. Annually, Seller will provide Buyer with a confidential three year forecast of projected Capital Improvements Work.

4.3 Planned Outage Schedule. Seller will develop and implement, or cause to be developed and implemented, a planned outage and maintenance schedule for Facilities that Seller operates that is coordinated with American Electric Power Service Corporation. For Facilities that are not operated by Seller, Seller will communicate Buyer's input on planned outages and maintenance schedules for such Facilities to the Facility operator.

4.4 Auxiliary Power. During any hour that the Facility is out of service, Seller or the applicable Facility operator will procure the energy used by Facility auxiliaries during that hour, the cost of which will be borne by the Buyer.

ARTICLE V

PRICING

5.1 Monthly Payments. For each calendar month during the Delivery Period, Buyer shall pay Seller an amount (the "**Monthly Payment**") equal to the sum of (i) a Fuel Payment, (ii) an O&M Payment, (iii) a Depreciation Payment, (iv) a Capacity Payment, (v) a Tax Reimbursement Payment, and (vi) Other Miscellaneous Payment. The Monthly Payment will be Seller's sole compensation for Seller's sale and delivery to Buyer of Buyer's Contractual Capacity and the Energy and Ancillary Services associated with Buyer's Contractual Capacity.

5.2 Fuel Payment. For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "**Fuel Payment**") equal to the Fuel Costs incurred by or invoiced to Seller at the Facilities for that month.

5.3 O&M Payment. For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "**O&M Payment**") equal to the Operation and Maintenance Costs at the Facilities for that month.

5.4 Depreciation Payment. For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "**Depreciation Payment**") equal to the sum of the depreciation expenses incurred by Seller for each Facility in Schedule A at the actual rate of depreciation during the relevant month and, in the case of jointly owned units, those expenses directly related to its ownership interest in the applicable Facility. The depreciation rates will be updated periodically at intervals that will not exceed five (5) years and the new rates will become effective on the subsequent January 1st during the Term of this Agreement. ~~Any positive net book value at the end of the commercial life of a given Facility will be included in the net book value of the other units at the same Facility and depreciated at an adjusted rate of those other units. If the final Facility or Facilities at a plant are retired, any remaining net book value will be payable by Buyer at that time, unless the Parties mutually agree upon an alternative payment arrangement.~~

5.5 Capacity Payment. For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "**Capacity Payment**") equal to the following:

$$CapacityPayment = \frac{FNBV \times WACOC}{12}$$

where,

FNBV = Seller's Net Book Value of the Facilities.

WACOC = $(DP\% \times LTDR) + (EP\% \times ROE)$

LTDR = Seller's Long Term Debt Rate

ROE = Seller's Return on Equity

DP% = Seller's Debt Percentage

EP% = Seller's Equity Percentage

Each component of the Capacity Payment that is subject to change under the terms of this Agreement will be updated as of January 1st of each calendar year during the Term of this Agreement, or at more frequent intervals as elected by Seller.

5.6 Tax Reimbursement Payment. For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "**Tax Reimbursement Payment**") equal to all Taxes (other than taxes included in Sections 5.2 through 5.5, above, such that there will be no duplication of Tax reimbursement to Seller) for that month applicable to Buyer's Contractual Capacity and the Energy and Ancillary Services associated with Buyer's Contractual Capacity, as more fully set forth in Article IX. Any Tax based upon income, gross receipts, commercial activity, or any similar Tax for which the inclusion of such Tax in the Monthly Payment would increase Seller's liability for any Tax including WACOC shall be grossed-up so as to make the receipt of any such Tax neutral to the Seller. Any Tax for any Straddle Period shall be included in the Monthly Payment based upon the ratio of the days in the month for the Monthly Payment over the total number of days in the Tax Period. Taxes included in the Monthly Payment may be estimated by Seller. The difference between estimated Taxes and the actual Taxes for which Buyer is responsible will be billed or credited to Buyer, as appropriate, in one or more installments following the end of the relevant Tax Period. For purposes of Taxes subject to the provisions of this Section 5.6, all Taxes shall be based upon the amount accrued for the relevant calendar month billing period, including any deferred tax amount.

5.7 Other Miscellaneous Payment.

For each calendar month during each Contract Year, Buyer shall pay Seller an amount (the "Other Miscellaneous Payment") which shall include:

(A) Any other costs and credits as described within this Agreement not already included in the other payment components or any other costs or credits reasonably associated with the Facilities which may be billed monthly or if incurred less frequently, on either a quarterly or as incurred basis. For example, the Parties understand and agree that the cost of Ancillary Services associated with the Facility Capacity that are requested and delivered in accordance with regular dispatch of a Facility in accordance with this Agreement is included in and compensated for by

the Monthly Payment. The Other Miscellaneous Payment shall also include, but not necessarily be limited to, any PJM charges and credits associated with the Facilities.

(B) Where Buyer exercises its right under Section 2.3 to terminate this Agreement or an Early Termination Date is declared due to a Buyer Event of Default, Seller will invoice Buyer, and Buyer shall pay Seller, an amount equal to the sum of ~~the then undepreciated net book value of the Generating Facilities and the expected retirement-related costs associated with such Generating Facilities at the time this Agreement is terminated~~(x) amounts unpaid or owing as of the termination or Early Termination Date, plus (y) an amount of the remaining Monthly Payments, except for the Fuel Payment, for the shorter of i) three years, or ii) the remainder of the Delivery Period (such amount to be determined based on the most recent 12 months of Monthly Payments, excluding the Fuel Payments), minus (z) the amount of Seller's forecasted net revenues for Capacity (based on cleared BRA prices) during such shorter period, as determined by the Seller in a commercially reasonable manner.

~~(C) Where the Parties exercise their right under Section 2.4 to remove Unit(s) or Facilities terminate this Agreement, Seller will invoice Buyer, and Buyer shall pay Seller, an amount, determined by Seller in a commercially reasonable manner, equal to the sum of the then undepreciated net book value of the Unit(s) or Generating Facilities that are to be removed from this Agreement and the expected retirement-related costs associated with such Unit(s) or Generating Facilities at the time the Unit(s) or Facilities are removed from this Agreement. At Buyer's request and at Buyer's sole expense, the fair market value of the Unit(s) or Facilities, including all of the associated liabilities thereto will be determined by Seller, such values may be developed by Seller through the use of an independent appraisal or other competitive solicitation conducted by Seller to obtain bids to purchase the Unit(s) or Generating Facilities. To the extent any appraisal or competitive solicitation would result in positive revenues to Seller as a result of such sale, Seller will apply a credit on Buyer's invoice for such positive revenues, up to, but not exceeding, the amount invoiced by Seller hereunder. Seller retains the right of first refusal to match any bona fide offer that complies with all of the terms of any competitive solicitation. Where there is a disagreement over a retirement date for Unit(s) or Facilities and this Agreement is terminated under Section 2.4, in the event Seller intends to continue operating such Unit or Facility after it is removed from this Agreement in accordance with Section 2.4, Seller will also apply a credit to Buyer's invoice referenced above with respect to allocating the retirement-related costs of such Unit(s) or Facilities to account for the additional time Seller intends to operate the Unit(s) or Facilities after it is removed from this Agreement, in relation to the period of time Buyer purchased Energy and Capacity from such Unit(s) or Facilities hereunder.~~

ARTICLE VI

BILLING AND PAYMENT

6.1 Billing and Payment. The calendar month shall be the standard period for all payments under this Agreement. As soon as practicable after the end of each month, Seller will render to Buyer an invoice for the payment obligations incurred during the preceding month. Each component of the invoice will be described in reasonable detail. All invoices under this Agreement shall be due and payable on or before the twentieth (20th) day of each month, or tenth (10th) day after receipt of the invoice or, if such day is not a Business Day, then on the next

Business Day. Buyer will make payments by electronic funds transfer to the account designated by Seller, or by other mutually agreeable method(s). Any amounts not paid by the due date will be deemed delinquent and will accrue interest at the then current short term borrowing rate of the Seller ("Interest Rate"), such interest to be calculated from and including the due date to but excluding the date the delinquent amount is paid in full.

6.2 Books and Records; Audit. Seller shall keep, or shall cause to be kept, all necessary books of record, books of account, and memoranda of all transactions involving the Facility, in conformance, where required, with the FERC's Uniform System of Accounts. Seller shall make, or shall cause to be made, all computations relating to the Facilities and all allocations of the costs and expenses of the Facilities. Buyer has the right to examine the records of Seller to the extent reasonably necessary to verify the accuracy of any statement, charge or computation made pursuant to this Agreement (including any statements evidencing the quantities delivered to Buyer at the Delivery Point) within twelve (12) months of receipt of the statement, charge or computation. If any such examination reveals any inaccuracy in any statement, the necessary adjustments in such statement and the payments thereof will be made promptly, along with interest accrued at the Interest Rate, provided, however, that any claim by a Party for overpayment or underpayment with respect to an invoice is waived unless the other Party is notified of the claim within twelve (12) months after the invoice is rendered or any specific adjustment to the invoice is made. If an invoice is not rendered within twelve (12) months after the close of the month during which performance occurred, the right to payment for such performance is waived.

6.3 Netting of Payments. The Parties hereby agree that they shall discharge mutual debts and payment obligations due and owing to each other under this Agreement through netting, in which case all amounts owed by each Party to the other Party under this Agreement, including any related damages, interest, and payments or credits, shall be netted so that only the excess amount remaining due shall be paid by the Party who owes it.

ARTICLE VII

CREDIT REQUIREMENTS

7.1 Credit Assurances. If a Party (the "**Requesting Party**") has reasonable grounds to believe that the other Party's (the "**Posting Party**") creditworthiness or performance under this Agreement has become unsatisfactory, the Requesting Party will provide the Posting Party with written notice requesting Performance Assurance in an amount determined by the Requesting Party in a commercially reasonable manner. Upon receipt of such notice, the Posting Party shall remedy the situation within a reasonable period (not exceeding thirty (30) days) by providing such Performance Assurance to the Requesting Party.

7.2 Grant of Security Interest/Remedies. To secure its obligations under this Agreement and to the extent either or both Parties deliver Performance Assurance hereunder, each Party (a "**Pledgor**") hereby grants to the other Party (the "**Secured Party**") a present and continuing security interest in, and lien on (and right of setoff against), and assignment of, all cash collateral and cash equivalent collateral and any and all proceeds resulting therefrom or the liquidation thereof, whether now or hereafter held by, on behalf of, or for the benefit of, such

Secured Party, and each Party agrees to take such action as the other Party reasonably requires in order to perfect the Secured Party's first-priority security interest in, and lien on (and right of setoff against), such collateral and any and all proceeds resulting therefrom or from the liquidation thereof. Upon or any time after the occurrence or deemed occurrence and during the continuation of an Event of Default or an Early Termination Date, the Non-Defaulting Party may do any one or more of the following: (i) exercise any of the rights and remedies of a Secured Party with respect to all Performance Assurance, including any such rights and remedies under law then in effect; (ii) exercise its rights of setoff against any and all property of the Defaulting Party in the possession of the Non-Defaulting Party or its agent; (iii) draw on any outstanding Letter of Credit issued for its benefit; and (iv) liquidate all Performance Assurance then held by or for the benefit of the Secured Party free from any claim or right of any nature whatsoever of the Defaulting Party, including any equity or right of purchase or redemption by the Defaulting Party. The Secured Party shall apply the proceeds of the collateral realized upon the exercise of any such rights or remedies to reduce the Pledgor's obligations under the Agreement (the Pledgor remaining liable for any amounts owing to the Secured Party after such application), subject to the Secured Party's obligation to return any surplus proceeds remaining after such obligations are satisfied in full.

ARTICLE VIII

EVENTS OF DEFAULT, REMEDIES & LIMITATIONS

8.1 Events of Default. An "**Event of Default**" shall mean, with respect to a Party (a "**Defaulting Party**"), the occurrence of any of the following:

- (i) the failure to make, when due, any payment required pursuant to this Agreement if such failure is not remedied within ten (10) Business Days after written notice;
- (ii) any representation or warranty made by such Party herein is false or misleading in any material respect when made or when deemed made or repeated, and if not remedied within thirty (30) Business Days after written notice;
- (iii) the failure to perform any material covenant or obligation set forth in this Agreement (except to the extent constituting a separate Event of Default), if such failure is not remedied within thirty (30) Business Days after written notice;
- (iv) such Party becomes Bankrupt;
- (v) the failure of such Party to satisfy the creditworthiness/collateral requirements agreed to pursuant to Article VII; or
- (vi) such Party consolidates or amalgamates with, or merges with or into, or transfers all or substantially all of its assets to, another Person and, at the time of such consolidation, amalgamation, merger or transfer, the resulting, surviving or transferee Person fails to assume all the obligations of such Party under this Agreement to which it

or its predecessor was a Party by operation of law or pursuant to an agreement reasonably satisfactory to the other Party.

8.2 Remedies. If an Event of Default with respect to a Defaulting Party shall have occurred and be continuing, the other Party (the “**Non-Defaulting Party**”) shall have the right, at its sole discretion, to take any one or more of the following actions: (i) to exercise any rights and remedies under this Agreement or law with respect to any Performance Assurance or other financial assurance; (ii) to withhold any payment due to the Defaulting Party under this Agreement; (iii) to suspend its performance; (iv) to cancel this Agreement by declaring a date for its early termination (an “**Early Termination Date**”); or (v) exercise such other rights or remedies it may have in contract, in equity, or at law. An Early Termination Date shall not relieve a Party of its obligation to payments hereunder. None of the remedies conferred upon the Parties above is intended to be exclusive of any other remedy or remedies now or hereafter existing and every such remedy will be cumulative and shall be in addition to the remedies set forth above and every other remedy. Each party may commence such suits, actions or proceedings, at law or in equity, including suits for specific performance, as may be necessary or appropriate to enforce this Agreement.

8.3 Limitation of Remedies, Liability and Damages. EXCEPT AS SET FORTH HEREIN, THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY AND ALL IMPLIED WARRANTIES ARE DISCLAIMED. FOR BREACH OF ANY PROVISION OF THIS AGREEMENT, THE OBLIGOR’S LIABILITY SHALL BE LIMITED TO DIRECT DAMAGES ONLY, SUCH DIRECT DAMAGES SHALL BE THE SOLE AND EXCLUSIVE REMEDY AND ALL OTHER REMEDIES OR DAMAGES AT LAW OR IN EQUITY ARE WAIVED. NEITHER PARTY SHALL BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, PUNITIVE, EXEMPLARY OR INDIRECT DAMAGES, LOST PROFITS OR OTHER BUSINESS INTERRUPTION DAMAGES, BY STATUTE, IN TORT OR CONTRACT, UNDER ANY INDEMNITY PROVISION OR OTHERWISE. IT IS THE INTENT OF THE PARTIES THAT THE LIMITATIONS HEREIN IMPOSED ON REMEDIES AND THE MEASURE OF DAMAGES BE WITHOUT REGARD TO THE CAUSE OR CAUSES RELATED THERETO, INCLUDING THE NEGLIGENCE OF ANY PARTY, WHETHER SUCH NEGLIGENCE BE SOLE, JOINT OR CONCURRENT, OR ACTIVE OR PASSIVE.

ARTICLE IX

TAXES

9.1 Cooperation. Each Party shall use reasonable efforts to implement the provisions of and to administer this Agreement in accordance with the intent of the parties to minimize all Taxes, so long as neither Party is materially adversely affected by such efforts.

9.2 Taxes. Subject to reimbursement by Buyer as set forth in Article V, Seller shall pay or cause to be paid all Taxes imposed on or with respect to the Buyer’s Contractual Capacity and associated Energy and Ancillary Services arising prior to the Delivery Point. Buyer shall pay the Tax Reimbursement Payment and pay or cause to be paid all Taxes on or with respect to the Buyer’s Contractual Capacity and associated Energy and Ancillary Services at and from the

Delivery Point. In the event Seller is required by law or regulation to remit or pay Taxes which are Buyer's responsibility hereunder, Buyer shall promptly reimburse Seller for such Taxes as set forth in Article V. If Buyer is required by law or regulation to remit or pay Taxes which are Seller's responsibility hereunder, Buyer may deduct the amount of any such Taxes from the sums due to Seller under Article V of this Agreement. Nothing shall obligate or cause a Party to pay or be liable to pay any Taxes for which it is exempt under the law.

9.3 Change-in-Law Taxes. Buyer shall be responsible for (or receive the benefit of) all Change-in-Law Taxes.

9.4 Exemptions. Either Party, upon written request of the other, shall provide a certificate of exemption or other reasonably satisfactory evidence of exemption if either Party is exempt from any Taxes and shall use all reasonable efforts to obtain or maintain, or to enable the other Party to obtain or maintain, any exemption from or reduction of any Taxes, whether currently available or becoming available in the future. Without limiting the generality of the foregoing, the Parties agree that, if beneficial to the efforts of either Party to obtain or maintain any exemption from or reduction of any Taxes, whether currently available or becoming available in the future, the Parties will cooperate to restructure the transactions contemplated by this Agreement so as to enable either Party to obtain or maintain such exemption or reduction, as the case may be; provided, however, that any such restructuring shall not affect adversely the economic consequences of this Agreement to either Party or subject either Party to any regulatory jurisdiction other than that to which it is subject on the date set forth in the preamble to this Agreement.

ARTICLE X

COMPLIANCE WITH LAWS; ADMINISTRATION

10.1 Seller's Compliance. Seller shall, at its expense, comply with all applicable laws and obtain and maintain all Governmental Approvals applicable to Seller and/or the Facilities or necessary for Seller's performance of its obligations hereunder. Notwithstanding the foregoing, Seller shall not be deemed in default of this obligation if it is contesting the application, interpretation, order, or other legal direction or Governmental Approval of any Governmental Authority in good faith and with due diligence through appropriate proceedings and if such non-compliance does not have a material adverse effect on Seller's performance of this Agreement. Seller agrees to adhere to the applicable operating policies, criteria and guidelines of NERC.

10.2 Buyer's Compliance. Buyer shall at its expense, at all times, comply with all applicable laws and obtain and maintain all Governmental Approvals applicable to Buyer or necessary for Buyer's performance of its obligations hereunder. Notwithstanding the foregoing, Buyer shall not be deemed in default of this obligation if Buyer is contesting the application, interpretation, order, or other legal direction or Governmental Approval of any Governmental Authority in good faith and with due diligence through appropriate proceedings and if such non-compliance does not have a material adverse effect on Buyer's performance of this Agreement. Buyer agrees to adhere to the applicable operating policies, criteria and guidelines of the NERC.

10.3 Administration. Seller will promptly provide Buyer with copies of all written notices from the operator or other co-owners pertaining to the Facilities that materially affect, or potentially materially affect, Buyer's rights and obligations under this Agreement, including all invoices, budgets, maintenance schedules, outage/derating notices, availability forecasts, and material contracts, to the extent not restricted by an obligation of confidentiality for which Seller cannot obtain a waiver or other appropriate relief. At all times during the Term, Seller shall cause the Facility operator to perform its responsibilities and otherwise discharge its obligations in respect of the applicable Facility, and maintain accurate records regarding the foregoing, in accordance with all relevant Governmental Approvals and all applicable statutes, codes, regulations, standards, and guidelines adopted by Governmental Authorities, NERC and the Transmission Operator from time to time.

10.4 Operating Committee. By written notice to each other, the Parties and American Electric Power Service Corporation each shall name one representative ("Representative") to act for it in matters pertaining to the Parties' obligations under this Agreement and to develop, if necessary, operating procedures for the generation, delivery and receipt of Energy hereunder, and such other mutually agreed upon contract administration procedures. Any Party may change its Representative at any time by written notice to the other Parties. The Representatives for the respective Parties shall comprise the Operating Committee. The Representative for American Electric Power Service Corporation shall be free to express the views of such Party, but shall not have a vote on the Committee except in the case of a tie between the other Parties. The Operating Committee shall meet at least annually, and at such other times as any Party may reasonably request. The Parties shall cooperate in providing to the Operating Committee the information it reasonably needs to carry out its duties. The Operating Committee will review and approve decisions regarding the retirement ~~or early retirement of any~~ dates of the Facilities for depreciation or other purposes, annual budgets, capital expenditures, procedures and systems for dispatch and notification of dispatch, procedures for communication and coordination with respect to Facility capacity availability, discuss scheduling of outages for maintenance, as well as the return to availability following an unplanned outage, approval of material contracts for Fuel, establishment of specifications for Fuels, and other duties as assigned by agreement of the Representatives.

10.5 Seller's Negative Covenants. Seller will not take any action or fail to take any action that would cause a default by Seller under the Facility Operating Agreement(s). Seller shall not, without the prior written consent of Buyer, (i) terminate or suspend any Facility Operating Agreement(s) or its interest in such Facility, (ii) amend or modify a Facility Operating Agreement(s), or (iii) grant any waiver or consent with respect to Facility Operating Agreement(s) or its interest in such Facility that would, in the case of (ii) and (iii) above, materially affect, or potentially materially affect, Buyer's rights and obligations under this Agreement, unless Seller shall first have obtained Buyer's written consent, which consent shall not be unreasonably withheld, conditioned or delayed.

ARTICLE XI

CONDITIONS

11.1 Conditions. Subject to Section 11.2 and except to the extent waived in writing by the Parties in their sole and absolute discretion, the obligation of the Parties to consummate the transactions contemplated hereunder shall be subject to fulfillment of the following conditions:

- (i) The occurrence of the Closing.
- (ii) If required, Seller shall have filed with the FERC and received acceptance of this Agreement that is satisfactory to Seller and Buyer in their sole judgment and discretion, without any limitation thereto whatsoever.
- (iii) The Parties shall each have obtained any and all other Approvals required with respect to the performance of their respective obligations hereunder and such Approvals shall be in form and substance satisfactory to Seller and Buyer in their sole and absolute discretion.

11.2 Obligations of Buyer and Seller. Commencing on the date set forth in the preamble to this Agreement, on the terms and subject to the conditions of this Agreement, each Party shall use its commercially reasonable efforts to take, or cause to be taken, all appropriate action, and do, or cause to be done, and assist and cooperate with the other Party in taking or doing, all things necessary, proper or advisable to consummate the transactions contemplated hereby, including, without limitation the satisfaction of the conditions set forth in Section 11.1.

11.3 Failure of Conditions Generally. This Agreement may be terminated by either Party in the event that the conditions set forth in Section 11.1 are not satisfied or waived by the Parties in accordance with such Section.

ARTICLE XII

REPRESENTATIONS AND WARRANTIES

12.1 Representations and Warranties of Both Parties. On the date set forth in the preamble to this Agreement each Party represents and warrants to the other Party that:

- (i) it is duly organized, validly existing and in good standing under the laws of the jurisdiction of its formation;
- (ii) subject to the fulfillment of the conditions set forth in Section 11.1, it has all Governmental Approvals necessary for it legally to perform its obligations under this Agreement;
- (iii) the execution, delivery and performance of this Agreement are within its powers, have been duly authorized by all necessary action and do not violate any of the terms and conditions in its governing documents, any contracts to which it is a party or any law, rule, regulation, order or the like applicable to it;

- (iv) this Agreement constitutes a legally valid and binding obligation enforceable against it in accordance with its terms; subject to any Equitable Defenses;
- (v) it is not bankrupt, however evidenced, and there are no proceedings pending or being contemplated by it or, to its knowledge, threatened against it which would result in it being or becoming bankrupt;
- (vi) there is not pending or, to its knowledge, threatened against it any legal proceedings that could materially adversely affect its ability to perform its obligations under this Agreement;
- (vii) no material breach of this Agreement with respect to it has occurred and is continuing and no such event or circumstance would occur as a result of its entering into or performing its obligations under this Agreement; and
- (viii) it has entered into this Agreement in connection with the conduct of its business and it has the capacity or ability to make or take delivery of the Buyer's Contractual Capacity and associated Energy and Ancillary Services.

ARTICLE XIII

MISCELLANEOUS

13.1 Title and Risk of Loss. Title to and risk of loss related to the Capacity and associated Energy and Ancillary Services shall transfer from Seller to Buyer at the Delivery Point. Seller warrants that it will deliver to Buyer the Capacity and associated Energy and Ancillary Services free and clear of all liens, security interests, claims and encumbrances or any interest therein or thereto by any Person arising prior to the Delivery Point.

13.2 Indemnity. Each Party shall indemnify, defend and hold harmless the other Party and such Party's partners, directors, officers, employees, agents and representatives (the "**Indemnified Parties**") from and against any Claims arising from or out of any event, circumstance, act or incident first occurring or existing during the period when control of, risk of loss related to, and title to the Capacity and associated Energy and Ancillary Services is vested in such Party as provided in Section 13.1, except to the extent, as to any Indemnified Party, such Claims are attributable to the gross negligence or willful misconduct of such Indemnified Party. Each Party shall indemnify, defend and hold harmless the other Party against any Taxes for which such Party is responsible under Article IX. The foregoing indemnities shall forever survive the termination of the Agreement.

13.3 Amendments and Waivers. Neither this Agreement nor any provisions hereof may be waived, amended or modified except pursuant to an agreement or agreements in writing entered into by both Parties.

13.4 Notices. All notices, requests, statements or payments shall be made as specified in Schedule 13.4. Notices, other than notices regarding availability, Scheduling and Dispatch of a Facility shall, unless otherwise specified herein, be in writing and shall be deemed to be given or made if delivered by (a) hand delivery, electronic mail or other electronic transmission device

capable of written record or facsimile, in each case, effective at the close of business on the day actually received, if received during business hours on a Business Day, otherwise shall be effective at the close of business on the next Business Day, or (b) United States mail or overnight courier service, in each case, effective on the next Business Day after it was sent. Notices regarding the availability, Scheduling and Dispatch of a Facility may be made (x) telephonically, effective when made, or (y) by electronic mail or other electronic device capable of written record, effective when received. A Party may change its notice details by providing a notice of same to the other Party in accordance herewith.

13.5 Successors and Assigns; Assignment. The provisions of this Agreement shall be binding upon and inure to the benefit of the Parties and the Parties' successors and assigns permitted hereby and no other Person shall acquire or have any rights under or by virtue of this Agreement. Neither Party shall assign this Agreement or its rights hereunder without the prior written consent of the other Party, which consent may be withheld in the exercise of its sole discretion; provided, however, that either Party may, without the consent of the other Party (and without relieving itself from liability hereunder) (i) transfer, sell, pledge, encumber or assign this Agreement or the accounts, revenues or proceeds hereof in connection with any financing or other financial arrangements, (ii) transfer or assign this Agreement to an Affiliate, or (iii) transfer or assign this Agreement to a successor to all or substantially all of Seller's Schedule A Units and Facilities provided such assignee shall agree in writing to be bound by the terms and conditions of this Agreement, and, as applicable, be a qualified operator of the Schedule A Units and Facilities. In addition to the foregoing, Seller shall require as a condition of said sale, assignment or other transfer that such other Person agree in writing to be bound by the terms and conditions of this Agreement to the same extent, such that Buyer's right to purchase such products shall continue uninterrupted and in the same manner as set forth in this Agreement without material alteration. Schedule A reflects Seller's current ownership percentages of the Facilities, and Seller may change these amounts during the Term, in whole or in part, without triggering the above provisions, provided that the overall generation capacity hereunder remains at a comparable level and such change avoids adverse impact to the economic interests of Buyer (and its retail customers) hereunder. Buyer or Seller may terminate that portion of this Agreement where there is a transfer or assignment of a Unit or Units and there is a termination of retail rate recovery related to the transferred or assigned Unit or Units.

13.6 Integration. This Agreement constitutes the entire agreement between the Parties relating to the subject matter hereof and supersedes any and all previous and understandings, oral or written, between the Parties relating to the subject matter hereof.

13.7 Acknowledgments. This Agreement shall be considered for all purposes as prepared through the joint efforts of the Parties and shall not be construed against one Party or the other as a result of the preparation, substitution, submission or other event of negotiation, drafting or execution hereof.

13.8 Waiver. No failure to exercise and no delay in exercising by a Party any right, remedy, power or privilege hereunder shall operate as a waiver thereof; nor shall any single or partial exercise of any right, remedy, power, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any right, remedy power or privilege.

13.9 Counterparts. This Agreement may be executed by the Parties in any number of counterparts, which, taken together, shall constitute one and the same legal binding instrument. Delivery of an executed counterpart of a signature page of this Agreement by facsimile transmission shall be effective as delivery of a manually executed counterpart of this Agreement.

13.10 Headings. The headings used herein are for convenience and reference purposes only.

13.11 Confidentiality. Neither Party shall disclose the terms or conditions of this Agreement to a third party (other than the Parties' employees, lenders, counsel, accountants or advisors who have a need to know such information and have agreed to keep such terms confidential) except in order to comply with any applicable law, regulation, or any exchange, control area or independent system operator rule or in connection with any court or regulatory proceeding; provided, however, that each Party shall, to the extent practicable, use reasonable efforts to prevent or limit the disclosure. Subject to the provisions of Section 8.3, the Parties shall be entitled to all remedies available at law or in equity to enforce, or seek relief in connection with this confidentiality obligation.

13.12 Governing Law. THIS AGREEMENT AND THE RIGHTS AND DUTIES OF THE PARTIES HEREUNDER SHALL BE GOVERNED BY AND CONSTRUED, ENFORCED AND PERFORMED IN ACCORDANCE WITH THE LAWS OF THE STATE OF OHIO, WITHOUT REGARD TO PRINCIPLES OF CONFLICTS OF LAW. EACH PARTY WAIVES ITS RESPECTIVE RIGHT TO ANY JURY TRIAL WITH RESPECT TO ANY LITIGATION ARISING UNDER OR IN CONNECTION WITH THIS AGREEMENT.

13.13 Mobile/Sierra Doctrine. Absent the agreement of all Parties to the proposed change, the standard of review for changes to any rate, charge, classification, term or condition of this Agreement, whether proposed by a Party, a non-party or FERC acting sua sponte, shall be the "public interest" standard of review set forth in United Gas Pipe Line Co. v. Mobile Gas Service Corp., 350 U.S. 332 (1956) and Federal Power Commission v. Sierra Pacific Power Co., 350 U.S. 348 (1956) and Federal Power Commission v. Sierra Pacific Power Co., 350 U.S. 348 (1956) and clarified by Morgan Stanley Capital Group, Inc. v. Public Util. Dist. No. 1 of Snohomish, 554 U.S. 527 (2008), and NRG Power Marketing LLC v. Maine Public Utilities Commission, 558 U.S. 165 (2010) (the "**Mobile-Sierra Doctrine**").

13.14 Severability. Should any provision of this Agreement be held to be invalid or unenforceable, such provision shall be invalid or unenforceable only to the extent of such invalidity or unenforceability without invalidating or rendering unenforceable any other provision hereof.

[signatures appear on next page]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed and delivered by their duly authorized representatives as of the date set forth in the preamble to this Agreement.

| ~~GENCO~~ AEP GENERATION RESOURCES INC.

By: _____
Name:
Title:

OHIO POWER COMPANY

By: _____
Name:
Title:

Schedule A
Ohio Generation Facilities

Facility	Unit(s)	Location	Unit Capacity (MW)	Seller Ownership (%)	Seller Ownership (MW)
Cardinal	1	OH	592	100.0%	592
Conesville	4	OH	779	43.5%	339
Conesville	5	OH	405	100.0%	405
Conesville	6	OH	405	100.0%	405
Stuart	1	OH	577	26.0%	150
Stuart	2	OH	577	26.0%	150
Stuart	3	OH	577	26.0%	150
Stuart	4	OH	577	26.0%	150
Zimmer	1	OH	1,300	25.4%	330
Total			5,789		2,671

SCHEDULE 13.4

Notice Information

If to Seller:

| ~~[GENCO]~~ [AEP Generation Resources Inc.](#)
155 W. Nationwide Blvd. Suite 400
Columbus, Ohio 43215
Attention: President

with a copy to:

| ~~[GENCO]~~ [AEP Generation Resources Inc.](#)
One Riverside Plaza
Columbus, Ohio 43215
Attention: Secretary

If to Buyer:

Ohio Power Company
One Riverside Plaza
Columbus, Ohio 43215
Attention: President

with a copy to:

Ohio Power Company
One Riverside Plaza
Columbus, Ohio 43215
Attention: Secretary

IEU Set 1
Witness: Jay A. Ruberto

Case No. 14-1297-EL-SSO
Ohio Edison Company, The Cleveland Electric Illuminating Company and
The Toledo Edison Company for Authority to Provide for a Standard Service Offer
Pursuant to R.C. § 4928.143 in the Form of an Electric Security Plan

RESPONSES TO REQUEST

IEU Set 1 – On page 9, lines 4-5, of the Direct Testimony of Jay A. Ruberto, he states, “the
INT-25 Companies have the right to audit the costs charged to the Companies.” Identify the
agreement or contracts that define or provide these audit rights to the Companies.

Response: The Companies’ right to audit costs is by agreement in principle of the parties. See attached
term sheet related to the transaction. See Attachment “IEU Set 1-INT-25 Attachment 1.”

Term Sheet	
1. <i>Buyers:</i>	Ohio Edison Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company; provided that each Buyer's obligation will be several (and not joint) and provided further that the Buyer's several <i>pro rata</i> obligations will be updated on June 1 st of each year during the term hereof based on each Buyer's average of the coincident MW peaks, including distribution losses, on the ATSI system from the months of June through September of the prior year.
2. <i>Seller:</i>	FirstEnergy Solutions Corp.
3. <i>Product:</i>	All of Seller's rights in the Capacity of each Facility, together with the associated Energy, Ancillary Services, and Environmental Attributes
4. <i>Facilities:</i>	<ul style="list-style-type: none">i. W. H. Sammis Plant, a 2,220 MW coal-fired and 13 MW diesel-fired power plant located in Stratton, Jefferson County, Ohioii. Davis-Besse Power Station, a 908 MW nuclear power plant located in Oak Harbor, Ottawa County, Ohio; subject to condition that the NRC renews the operating license for Davis-Besse Facility for a 20-year termiii. Seller's 4.85% entitlement in Ohio Valley Electric Corporation ("OVEC")¹
5. <i>Quantity/Buyers' Contractual Capacity:</i>	One hundred percent (100%) of Sellers rights to the Capacity of each Facility together with Sellers rights to the Energy and

¹ Representing the rights and obligations associated with OE's 0.85% and TE's 4.00% OVEC ownership interests that were transferred to FE Generation and subsequently to Seller.

	Ancillary Services output associated with such 100% of each Facility's Capacity; provided that this term "Buyers' Contractual Capacity" includes one hundred percent (100%) of Sellers' rights to any capacity derates, uprates or capacity expansions at any Facility during the term of this Agreement.
6. <i>Delivery Points for Energy and Ancillary Services</i>	The unit-specific LMP Points at each Facility (PJM Pnodes to be specified in PPA).
7. <i>Obligation to Deliver/Receive:</i>	<p>Seller agrees to sell and deliver, and Buyers agree to purchase, receive, and pay for, Buyers' Contractual Capacity and the Energy and Ancillary Services associated with Buyers' Contractual Capacity delivered by Seller to the Delivery Points during each hour of the Delivery Period. Seller also agrees to sell and deliver, and Buyers agree to purchase and receive and pay for all Environmental Attributes associated with the Facilities; provided that at termination of the Agreement Buyers will assign to Seller, and Seller will accept without recourse, all Environmental Attributes for the Facilities and that are owned or controlled by Buyer that are effective or in effect for time periods after the termination date.</p>
8. <i>Unit Contingent:</i>	<p>All Energy, Capacity and Ancillary Services associated with each Facility and all of (i) Seller's obligation to sell and deliver, and (ii) Buyers' obligation to purchase, receive, and pay for, the Energy, Capacity and Ancillary Services associated with each Facility are Unit Contingent.</p> <p>Unit Contingent means, with respect to Energy, Capacity or Ancillary Services, that such Energy, Capacity or Ancillary Services is intended to be supplied from a given Facility and Seller's failure to deliver such Energy, Capacity or Ancillary Services is excused to the extent that a given Facility or portion of a Facility is unavailable; provided that Seller's failure to</p>

	<p>delivery Capacity, Energy or Ancillary Services will not be excused if the Seller could have avoided such failure by exercise of Good Utility Practice; and provided further that if Seller's failure to deliver Capacity, Energy or Ancillary Services could not have been avoided by exercise of Good Utility Practice then the failure to deliver such Energy, Capacity and Ancillary Services will be excused for the first 180 consecutive days of such unavailability period, and for any remaining unavailability period beyond the initial 180 day period Seller will provide replacement Capacity, Energy, Ancillary Services and Environmental Attributes (as the case may be), delivered to the ATSI zone, or the financial equivalent thereof for such remaining unavailability period; and provided further that in the event that a Capital Expenditure is required for Facility operations but such Capital Expenditure would render the affected Facility to be uneconomic then upon Buyers and Seller's written agreement Seller will either replace the Facility's output of Energy, Capacity, Ancillary Services and Environmental Attributes (all to be delivered to the ATSI zone at Seller's cost), or the Facility will be dropped from the PPA and Seller's obligations under the PPA for supply with regard to such Facility will be reduced to reflect that the Facility was dropped from the PPA.</p>
<i>9. Effective Date:</i>	The date the Agreement is executed by all Parties.
<i>10. Delivery Period:</i>	June 1, 2016 to May 31 st , 2031.
<i>11. Operating Work:</i>	During the Delivery Period, Seller has an obligation to perform the Operating Work in accordance with Good Utility Practice.
<i>12. Capital Expenditures:</i>	As pertains to the W.H. Sammis Plant and Davis-Besse Power Station, from time to time during the Delivery Period as deemed

	<p>necessary by Seller, Seller shall perform, or cause to be performed, Capital Expenditures Work related to such W.H. Sammis Plant and such Davis-Besse Power Station.</p> <p>By 120 days prior to the 12-month period that starts on June 1st of each year during the term of this agreement, Seller will develop and submit to Buyer for Buyer's review and comment an annual written Capital Expenditures plan for all Capital Expenditures Work deemed necessary by Seller that is scheduled to be performed at the Sammis Plant and the Davis-Besse Power Station during the referenced 12-month period. Within twenty (20) days of Buyer's receipt of the referenced plan, Buyer shall provide in writing to Seller any comments or queries to such plan, and Seller shall respond in writing (including where appropriate with documents as attachments or exhibits) to Buyer's queries (if any) within twenty (20) days of receipt of the Buyer's comments or queries. By 90 days prior to the referenced 12-month period, Seller and Buyer shall meet and discuss Buyer's comments and queries, and Seller's responses thereto. By 60 days prior to the referenced 12-month period, Seller shall issue a revised annual written Capital Expenditure plan that to the extent reasonable takes into account, or responds to, Buyer's comments and queries, including for each instance where the Seller did not accept or adopt one or more of Buyer's comments, an explanation for such non-acceptance or non-adoption.</p>
<p><i>13. Contract Price:</i></p>	<p>The Monthly Payment will be Seller's sole compensation for Seller's sale and delivery to Buyers of the Energy, Capacity and Ancillary Services and Environmental Attributes associated with the Facilities.</p>

	<p>The Monthly Payment will comprise the sum of monthly charges for: (1) the W.H. Sammis Plant and Davis Besse Power Station; and (2) the OVEC entitlement interest.</p> <p>(1) For the W.H. Sammis Plant and Davis-Besse Power Station, the Monthly Payment will be equal to the sum of (i) a Fuel Payment, (ii) an O&M Payment, (iii) a Depreciation Payment, (iv) a Capacity Payment, and (v) a Tax Reimbursement Payment.</p> <p>i. Fuel Payment: amount of Fuel Expenses incurred by Seller to operate some or all of the Facilities for each calendar month during each Contract Year.</p> <p>ii. O&M Payment: amount of Operation and Maintenance Expenses of each Facility incurred by Seller for each calendar month during each Contract Year.</p> <p>iii. Depreciation Payment: for each calendar month during each Contract Year, amount of depreciation, accretion and decommissioning expenses actually incurred by Seller during the relevant month and directly related to its ownership interest in each Facility. Except as may be required by law, adverse Governmental Authority action or due to an impairment of the asset due to Governmental Authority action(s) or change in law, Seller agrees not to charge accelerated depreciation (<i>i.e.</i>, advance the useful life of an asset) without Buyers' written agreement.</p> <p>iv. Capacity Payment: an amount for each calendar month during each Contract Year equal to:</p>
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	<p style="text-align: center;"><u>SIC x WACOC</u> 12</p> <p>v. Tax Reimbursement Payment: amount of Income Taxes applicable to Buyers' Capacity Payment based on the effective tax rate of the Seller. The effective tax rate will be updated annually. .</p> <p>(2) For the OVEC entitlement interest, the Monthly Payment will be equal to those costs related to and deriving from Seller's 4.85% entitlement in OVEC, as provided for in the Amended and Restated Inter-Company Power Agreement ("ICPA") dated as of September 10, 2010 among OVEC and its Sponsoring Companies (as such ICPA is amended from time to time).²</p>
<p>14. <i>Planned Outage Schedule:</i></p>	<p>Seller will develop and implement, or cause to be developed and implemented, an annual scheduled outage program for each Facility. Seller will review with Buyers the annual scheduled outage program for each Facility by no later than 120 days prior to the 12-month period that starts on June 1st during each year of the agreement. Seller agrees to notify Buyers of changes to the scheduled outage program as soon as reasonably practicable.</p>
<p>15. <i>Scheduling and Dispatch:</i></p>	<p>Buyers will Schedule and Dispatch 100% of the Energy and Ancillary Services associated with each Facility in accordance with the Agreement and within the operating parameters of each of the Facilities, as such operating parameters are determined by Seller from time to time.</p>

² As that term is defined in the ICPA, and which includes FirstEnergy Generation, LLC.

	<p>Upon the Effective Date, but no later than five (5) business days after the Effective Date, Seller will effect in PJM's eRPM system the transfer of capacity rights to Buyers for the Delivery Period. Buyers will be solely responsible for offering Buyers' Contractual Capacity into the PJM capacity auctions occurring after the Effective Date and covering PJM capacity delivery years within the Delivery Period.</p> <p>Seller assigns to Buyers, and Buyers accept, all rights and obligations for any portion of Buyers' Contractual Capacity in respect of the Delivery Period that has been offered or otherwise committed to PJM or another third party as of the Effective Date of the Agreement. Seller acknowledges Buyers' rights after the Effective Date to offer into the PJM capacity auctions Buyers' Contractual Capacity in respect of the Delivery Period that has not been offered or otherwise committed as of the Effective Date of the Agreement. Buyers assign to Seller, and Seller accepts without resource, all rights and obligations for any portion of Buyers' Contractual Capacity in respect of the Delivery Period that has been offered or otherwise committed to PJM or another third party for time periods at or after termination of the Agreement.</p> <p>All Energy and Ancillary Services associated with Buyers' Contractual Capacity and made available at a given Delivery Point will be allocated to Buyers in accordance with their respective Shares and will be recorded by the Parties in PJM's scheduling and settlement systems. All credits and charges (including Imbalance Charges) associated with the Capacity, and Energy and Ancillary Services associated therewith and made available at a given Delivery Point will be settled in the</p>
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	respective PJM accounts of Buyers by means of the PJM settlement process.
<i>16. Force Majeure:</i>	<p>To the extent any Party is prevented by Force Majeure from carrying out, in whole or in part, its obligations under the Agreement (other than an obligation to pay money), and such Party (the "Affected Party") gives notice and details of the Force Majeure to the other Parties as soon as practicable (but not later than thirty (30) days thereafter to the extent such details are then available) then the Affected Party shall be excused from the performance of its obligations under the Agreement (other than the obligation to make payments and, in the case of Seller, Seller's obligation to supply Capacity) so long as the Affected Party shall be using all reasonable efforts to overcome the Force Majeure and resume performance as soon as possible; provided that such term "Force Majeure" will not include any event, circumstance or occurrence which could have been avoided through the exercise of Good Utility Practice; and provided further that such term "Force Majeure" will not apply to Seller's obligation to cover the capacity supply obligation associated with each facility as such obligation is reflected in PJM's eRPM system. The non-Affected Parties shall not be required to perform or resume performance of its obligations (excluding payment obligations) to the Affected Party corresponding to the obligations of the Affected Party excused by Force Majeure, until such time and to the extent the Affected Party resumes its performance.</p>
<i>17. Payments and Netting:</i>	<p>As soon as practicable after the end of each month, but no later than fifteen (15) days before payment is due, Seller will render to Buyers an invoice for the payment obligations incurred during the preceding month. All invoices shall be due and payable on or before the twentieth (20th) day of each month.</p>

	<p>The Parties shall discharge mutual debts and payment obligations due and owing to each other under the Agreement through netting, in which case all amounts owed by each Party to the other Party, including any related damages, interest, and payments or credits, shall be netted so that only the excess amount remaining due shall be paid by the Party who owes it.</p>
<p><i>18. Books and Records; Audit:</i></p>	<p>Seller shall keep all necessary books of record, books of account, and memoranda of all transactions involving each Facility, in conformance, where required, with GAAP and the FERC's Uniform System of Accounts. Seller shall make all computations relating to the Facility and all allocations of the costs and expenses of each Facility.</p> <p>Buyers have the right to examine the Seller's records to the extent reasonably necessary to verify the accuracy of any statement, charge or computation. If requested, Seller shall provide to Buyers statements evidencing the quantities delivered to the Buyers at the Delivery Points. If any such examination reveals any inaccuracy in any statement, the necessary adjustments in such statements and the payments thereof will be made promptly, provided, however, that any claim by a Party for overpayment or underpayment with respect to an invoice is waived unless the other Party is notified of the claim within ninety (90) days after the invoice is rendered or any specific adjustment to the invoice is made.</p> <p>Seller shall reasonably and timely provide all data and information requested by Buyers: (i) to respond to a Governmental Authority request for information; (ii) to prepare for and make other regulatory filings; and (iii) as required by law with respect to Buyers.</p>

<i>19. Limitations of Liability:</i>	<p>For breach of any provision of the Agreement, obligor's liability shall be limited to direct damages only, such direct damages shall be the sole and exclusive remedy and all other remedies or damages are waived.</p> <p>No Party shall be liable for consequential, incidental, punitive, exemplary, or indirect damages, lost profits or other business interruption damages, by statute, in tort or contract, under any indemnity provision or otherwise.</p>
<i>20. Conditions:</i>	<p>Seller's obligation to consummate the transaction is subject to the Seller having obtained any and all Approvals required with respect to its obligations under the Agreement and such Approvals shall be in form and substance satisfactory to Seller in its sole and absolute discretion; provided that, in the event that Seller learns that a required Governmental Approval is lacking and after reasonable effort is not and will not be forthcoming (such reasonable effort to be determined by Seller), then Seller may upon ten (10) days written notice to Buyers terminate the Agreement.</p>
<i>21. Representations and Warranties:</i>	<p>Each Party represents and warrants that:</p> <ul style="list-style-type: none">(i) It is duly organized, validly existing, and in good standing(ii) The execution, delivery and performance of the Agreement are within its powers, have been duly authorized by all necessary action and do not violate any of the terms and conditions in its governing documents, and any contracts to which it is a party(iii) The Agreement is a legally valid and binding obligation enforceable against it(iv) It is not bankrupt

	<p>(v) There is not pending against it legal proceedings that could materially adversely affect its ability to perform its obligations under this Agreement</p> <p>(vi) No material breach of the Agreement has occurred and would not occur as a result of its entering into or performing its obligations under the Agreement</p> <p>(vii) It has entered into the Agreement in connection with the conduct of its business and it has the capacity or ability to make or take delivery of the Buyers' Contractual Capacity and associated Energy and Ancillary Services</p>
<i>22. Risk of Loss:</i>	Title to and risk of loss related to the Capacity and associated Energy and Ancillary Services shall transfer from Seller to Buyers at the Delivery Points.
<i>23. Indemnification:</i>	Each Party shall indemnify, defend and hold harmless the other Parties and such Parties' partners, directors, officers, employees, agents and representatives from and against any Claims arising from or out of any event, circumstance, act or incident first occurring or existing during the period when control of, risk of loss related to, and title to the Capacity and associated Energy and Ancillary Services is vested in such Party.
<i>24. Assignment:</i>	No Party shall assign the Agreement without the prior written consent of the other Parties, which consent may be withheld in a Party's sole discretion; provided, however, that any Party may, without the consent of the other Parties (and without relieving itself from liability), (i) transfer, sell, pledge, encumber or assign the Agreements or the accounts, revenues or proceeds thereof in connection with any financing or other financial arrangements, (ii) transfer or assign the Agreement to an

	Affiliate which shall agree in writing to be bound to the terms and conditions of the Agreement.
25. <i>Governing Law:</i>	Ohio
26. <i>Standard of Review:</i>	Absent the agreement of all Parties to the proposed change, the standard of review for changes to any rate, charge, classification, term or condition of the Agreement shall be the <i>Mobile-Sierra</i> Doctrine ("public interest" standard).

Definitions

“Ancillary Services” means regulation and frequency response services; energy imbalance services; automatic generating control services; spinning, non-spinning, supplemental and replacement reserve services; reactive power and voltage support services; black start services; and all other services or products ancillary to the operation of the Facilities that are defined as ancillary services in PJM’s tariff or are commonly sold or saleable, to the extent that the assets comprising a given Facility are technically capable of providing those services or products.

“Approvals” means all approvals, permits, licenses, consents, waivers or other authorizations from, notifications to, or filings or registrations with, third parties, including Governmental Approvals.

“Capacity” means the output level, expressed in MW, that each Facility, or the components of equipment thereof, is capable of continuously producing and making available at the Delivery Point associated with such Facility, taking into account the operating condition of the equipment at that time, the auxiliary loads and other relevant factors; provided that the term Capacity shall mean the capacity supply obligation that is associated with each of the Facilities in PJM’s eRPM system for any PJM Delivery Year for which a capacity supply obligation has been established under PJM’s tariffs.

“Capacity Payment”

$$\text{“Capacity Payment”} = \frac{\text{SIC} \times \text{WACOC}}{12}$$

“Seller’s Invested Capital (“SIC”) means the total net book value of the in-service Facilities, including nuclear fuel (but only to the extent that applicable accounting rules permit nuclear fuel costs to be capitalized), any Accumulated Deferred Income Taxes associated with the invested capital, allocations of capital used to support the Facilities, Materials and Supplies Inventory (including to the extent that applicable accounting rules permit fossil fuel), and Capital Expenditures Work that is performed at any Facility and that is placed into service after the Effective Date. To the extent that there is a difference between SIC costs for a given month and SIC collections for that month, the SIC calculation for future months will include a reconciliation to “true up” such difference. The total SIC will be calculated as the average of the total net book value at beginning of the month and the end of the month, respectively.

“Weighted Average Cost of Capital (“WACOC”) means the sum of the equity component and the debt component of the WACOC. WACOC is calculated using a 50% equity and 50% debt capital structure. The equity component of the WACOC will be the product of the equity share of the capital structure and the ROE (*i.e.*, $0.5 * 0.1115$). The debt component will be the product of the debt share of the capital structure and the Seller’s embedded cost of debt which changes annually (*i.e.*, $0.5 * \text{long-term embedded cost of debt}$). An example formula for calculating the WACOC is:

$$\text{WACOC} = (0.5 * 0.1115) + (0.5 * \text{long-term embedded cost of debt})$$

“Seller’s Return on Equity (“ROE”) means Seller’s ROE, which is defined as 11.15% and shall be fixed over the term of the agreement.

“Capital Expenditures Work” shall mean the modeling, studying, engineering, design, procurement, purchasing, construction, inspection, start-up and testing of capital expenditures, replacements, spares,

repairs or additions to a given Facility, procurement of auxiliary power necessary to support other Capital Expenditures Work, procurement or retention of licenses (but only where applicable accounting rules permit such costs to be capitalized); including any and all such actions as may be required to comply with a permit, rule, regulation, order, standard or other requirements of a Governmental Authority.

"Claims" means all claims or actions, threatened or filed and, whether groundless, false, fraudulent or otherwise, that directly or indirectly relate to the subject matter of an indemnity, and the resulting losses, damages, expenses (including reasonable attorneys' fees and disbursements) and court costs, whether incurred by settlement or otherwise, and whether such claims or actions are threatened or filed prior to or after the termination of the Agreement.

"Effective Date" means the date on which all of the conditions precedent set forth in Section 20 have been satisfied or waived.

"Energy" means three-phase, 60-cycle alternating current electric energy, expressed in MWh.

"Environmental Attributes" means, to the extent associated with one or more the Facilities and/or the generation of Energy at a given Facility, as applicable, any and all of the following: renewable energy credits, renewable energy certificates, alternative energy credits, and any other credits, including environmental air quality credits, emissions reduction credits, energy credits, and any allowances, reductions, offsets, certificates, property, and benefits, that are granted or awarded or transferred or conferred or acquired over the Delivery Period through existing or new governmental programs on the basis of environmental, or power source, or emissions characteristics that are or may be related to Facility operations, and actual or potential emissions or avoided emissions or reductions of waste of any kind, to the air, soil or water of substances (in whatsoever form) that is or are now or may be in the future regulated under federal, state or local laws. The term "Environmental Attributes" does not include Energy, Capacity, or Ancillary Services or the power or energy attributes of a Facility or Facilities.

"Fuel Expenses" means all fixed or variable costs, expenses, losses, liabilities, claims and charges related to the acquisition, storage, inventory, balancing and transportation and delivery of fuel for the Facilities, including reagents, emissions allowances, and related costs of credit at weighted average cost; provided that the term "Fuel Expenses" excludes the costs of any fuel that is capitalized under applicable accounting rules and guidance; and provided further that all costs and expenses will be calculated on a consumed basis.

"GAAP" means accounting principles generally accepted in the United States of America.

"Good Utility Practice" means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

"Governmental Approvals" means any permit, authorization, registration, consent, action, waiver, exception, variance, order, judgment, decree, license, exemption, publication, filing, notice to, or declaration of or with, or required by any Governmental Authority or applicable law; provided that the

term Governmental Approval as used in this definition does not include the Public Utilities Commission of Ohio or its successor agency.

“Governmental Authority” means any federal, state, local, or municipal government body; and any governmental, regulatory, or administrative agency, commission, body, agency, instrumentality, or other authority lawfully exercising or entitled by law to exercise any executive, judicial, legislative, administrative, regulatory, or taxing authority or power, including any court or other tribunal.

“Imbalance Charges” means any penalties, fees or charges assessed by PJM for failure to satisfy requirements for balancing of electric energy receipts and deliveries or loads and generation, or payable to any other Person in connection with the delivery of energy in an amount(s) different from the amount(s) scheduled.

“Materials and Supplies Inventory” is as defined in Part 101, Uniform System of Accounts for Public Utilities, of FERC’s regulations, as such may be amended from time to time.

“Operation and Maintenance Expenses” means all fixed or variable costs, expenses, losses, liabilities, claims, charges and associated credits incurred directly or indirectly in the performance of operation, maintenance, use, repair of the Facility, including the procurement of auxiliary power, but not including Fuel Expenses.

“Operating Work” means the operation, maintenance, use, repair or retirement of the Facility on or after the Effective Date, including but not limited to labor; parts; supplies; insurance; permits; licensing; taxes other than income; procurement of ancillary services, fuel and other consumables; fuel acquisition, transportation balancing and storage; waste handling and disposal (including coal ash or spent nuclear fuel); filing, defense and settlement of claims, suits and causes of action; procurement (or sale) of Allowances and settlement of all other environmental charges (or credits) pertaining to the operation of the Facility; including any and all such actions as may be required to comply with a permit, rule, regulation, order, standard or other requirements of a Governmental Authority; but excluding any Capital Expenditures Work.

“Share” means, with respect to each Buyer, each Buyer’s several (and not joint) obligation, as such obligation is calculated as of June 1, 2016 based on each Buyer’s average of the coincident MW peaks, including distribution losses, on the ATSI system from the months of June through September of 2015; and provided further that the Buyer’s several *pro rata* obligations will be updated on June 1st of each subsequent updated on June 1st of each year during the term hereof based on each Buyer’s average of the coincident MW peaks, including distribution losses, on the ATSI system from the months of June through September of the prior year year during the term hereof based on each Buyer’s average of the coincident MW peaks, including distribution losses, on the ATSI system from the months of June through September of the prior year .

NEW ENTRY IN PJM CAPACITY AUCTIONS

	Capacity (MW-UCAP)		
Type of Capacity Addition	2015-16	2016-17	2017-18
New Generation	4,899	4,282	5,927
Generation Upgrades	447	1,181	340
Total	5,346	5,463	6,267

Source: PJM, 2017-2018-base-residual-auction-report.pdf, 2014

Note: All capacities are expressed in MW unforced capacity (UCAP)

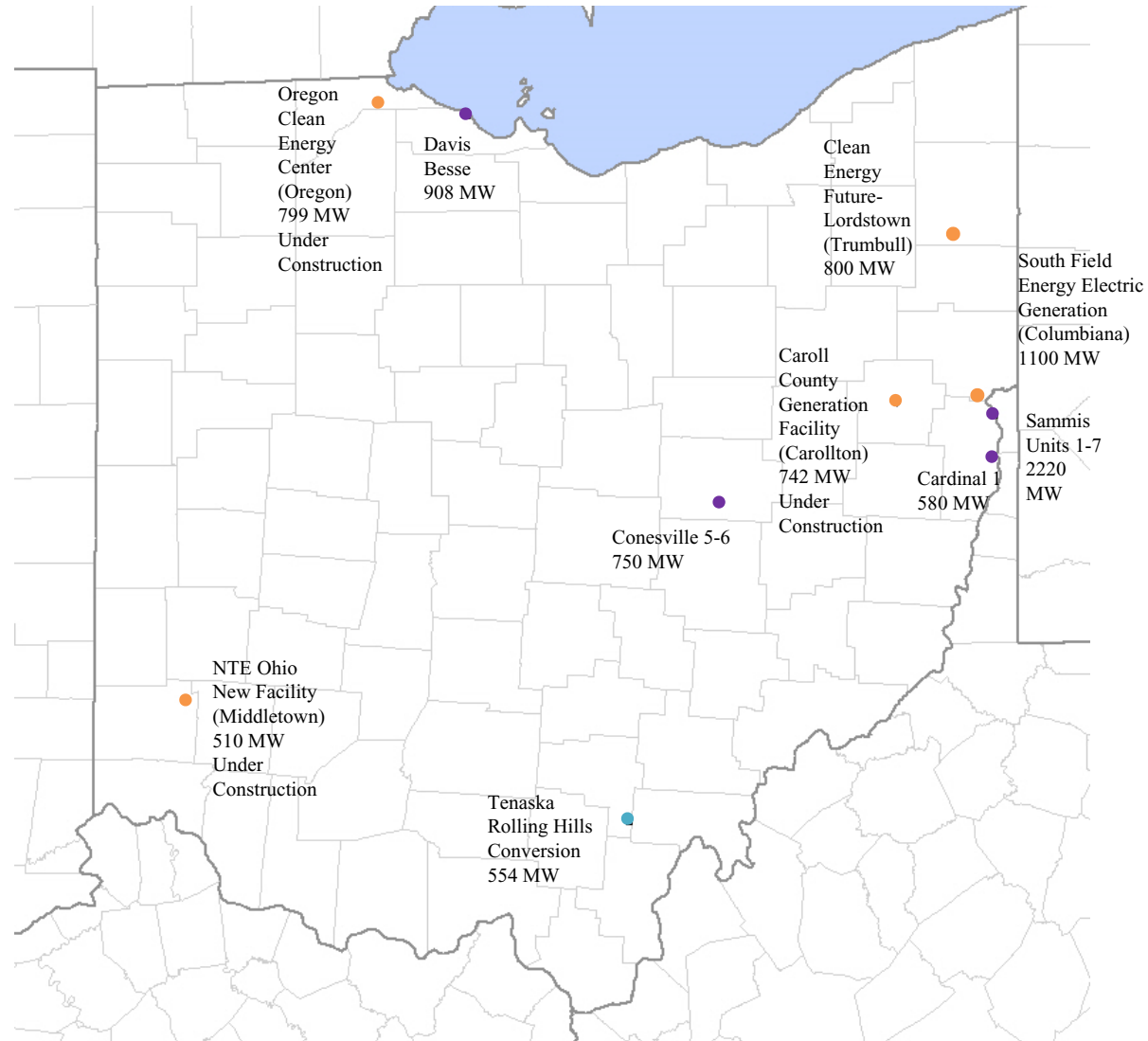
PJM NATURAL GAS PLANTS RECENTLY COMPLETED OR CURRENTLY UNDER CONSTRUCTION

Name	Owner	Capacity (MW)	State	Technology	Sources
Woodbridge Energy Center	Competitive Power Ventures Inc	700	NJ	CC	"CPV breaks ground on Woodbridge Energy Center in New Jersey", Energy Business Review, October 28, 2013.
Garrison Energy Center	Calpine Corp	309	DE	CC	"Calpine's Garrison Energy Center dedicated in Dover", Delaware State News, October 1, 2015.
Panda Liberty Power Project	Panda Power Funds	829	PA	CC	"Construction ahead of schedule on Panda Liberty plant", Daily Review, April 13, 2014.
Panda Patriot Power Project	Panda Power Funds	829	PA	CC	"[Panda Power Funds Breaks] Ground on Pennsylvania's Second 829-MW Marcellus Shale-Gas Power Plant", Panda Funds Online Newsroom, August 12, 2014.
West Deptford Energy Station Project	LS Power Group	738	NJ	CC	"Christie attends LS Power groundbreaking in West Deptford; officials announce expansion", Gloucester County Times, February 09, 2012.
Newark Energy Center	Energy Investors Funds Group	655	NJ	CC	"Energy Investors Funds Acquires Hess Corporation's 50 Percent Equity Stake in GE-Powered Newark Energy Center", Business Wire, June 20, 2014.
Perryman	Exelon Corp	120	MD	GT	"Exelon breaks ground on two natural-gas generating units at Perryman Station", The Baltimore Sun, July 22, 2014.
St Charles	Competitive Power Ventures Inc	725	MD	CC	"Competitive Power Ventures, [...] Close Financing of \$775 Million CPV St. Charles Energy Center in Maryland", PR Newswire, August 8, 2014.
Wildcat Point Generation Facility	Old Dominion Electric Coop	1,000	MD	CC	"Capacity Results: Who's In, Who's Out?", RTO Insider, June 3, 2014.
York Energy Center	Calpine Corp	760	PA	CC	"Calpine Reports Strong Second Quarter Results [...] Including Announcement of York 2 Energy Center in PJM", Calpine Corp, August 1, 2014.
Brunswick County Power Station	Dominion Resources Inc	1,358	VA	CC	"Dominion Hosts Groundbreaking Event for Brunswick County Power Station", PR Newswire, May 16, 2014.
Warren Power Generating	Dominion Resources Inc	1,329	VA	CC	"Dominion's natural gas-fired Warren County Power Station half complete", Power Engineering, September 26, 2013.
Nelson Energy Center	Invenergy LLC	600	IL	CC	"Invenergy Completes Project Financing For Nelson Energy Center in Illinois", Invenergy, December 12, 2013.
Oregon Energy Center	North American Project Development LLC	799	OH	CC	In the Matter of the Application of Oregon Clean Energy, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility, Case No. 12-2959-EL-BGN, Notice of Start of Construction November 12, 2014.
Loudoun Hybrid	Panda Power Funds	750	VA	CC	"Construction begins on Loudoun County power plant", The Washington Post, November 17, 2014.
Carroll County Energy Project	Advanced Power Services LLC	672	OH	CC	In the Matter of the Application of Carroll County Energy, LLC for a Certificate of Environmental Compatibility and Public Need to Construct an Electric Generation Facility, Case No. 13-1752-EL-BGN, Notice of Start of Construction April 7, 2015.
Middletown Energy Center	NTE Ohio, LLC	540	OH	CC	Re: NTE Ohio, LLC, OPSB Case No. 14-534-EL-BGN, Notice of NTE Ohio, LLC that Construction of the Facility has Commenced, October 5, 2015.
Total		12,713			

Note: CC indicates combined cycle and GT indicates gas turbine

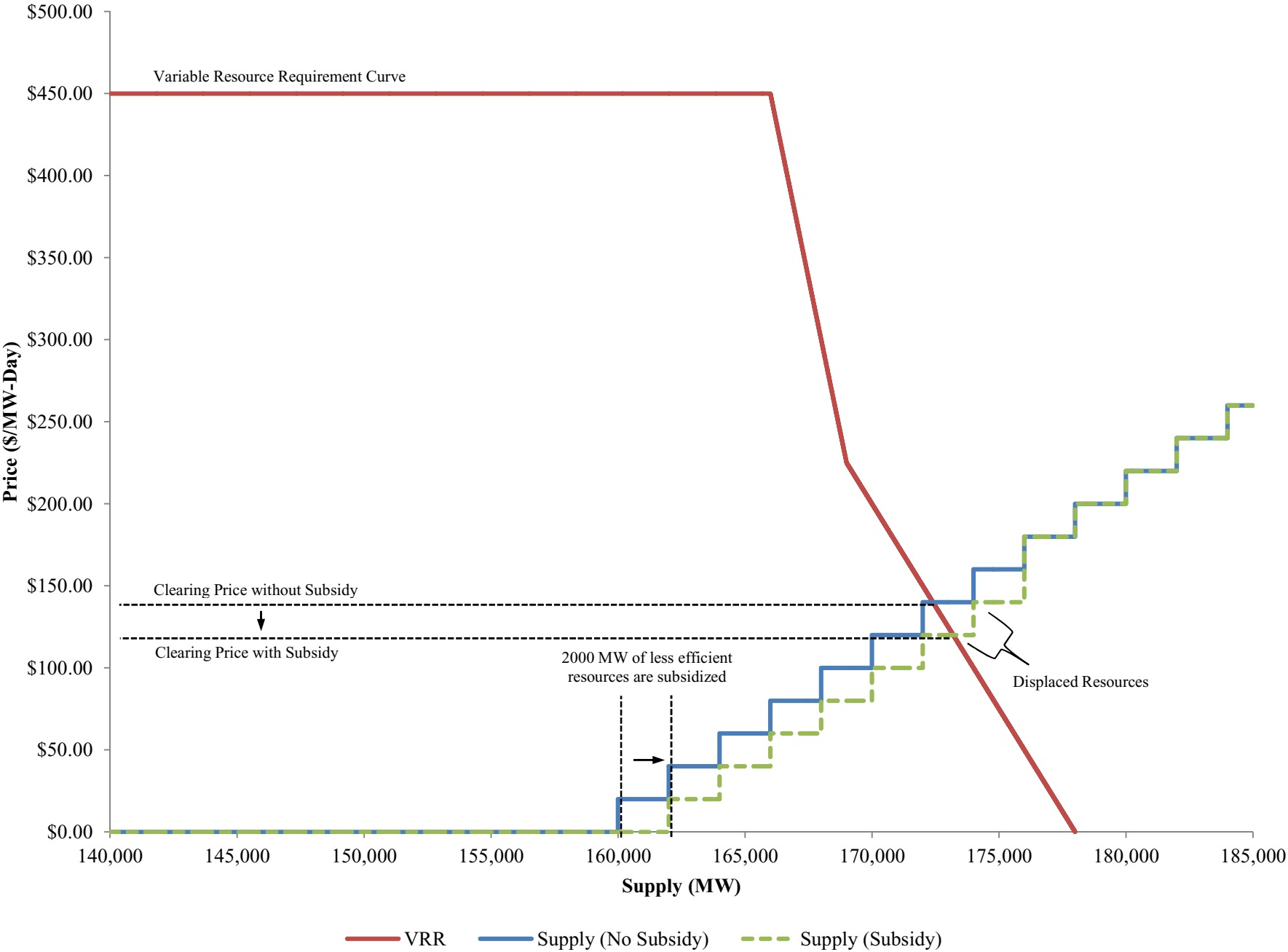
Sources: PJM Generation Queue; Ventyx Velocity Suite Products

SELECT DEVELOPING AND EXISTING POWER PLANTS IN OHIO



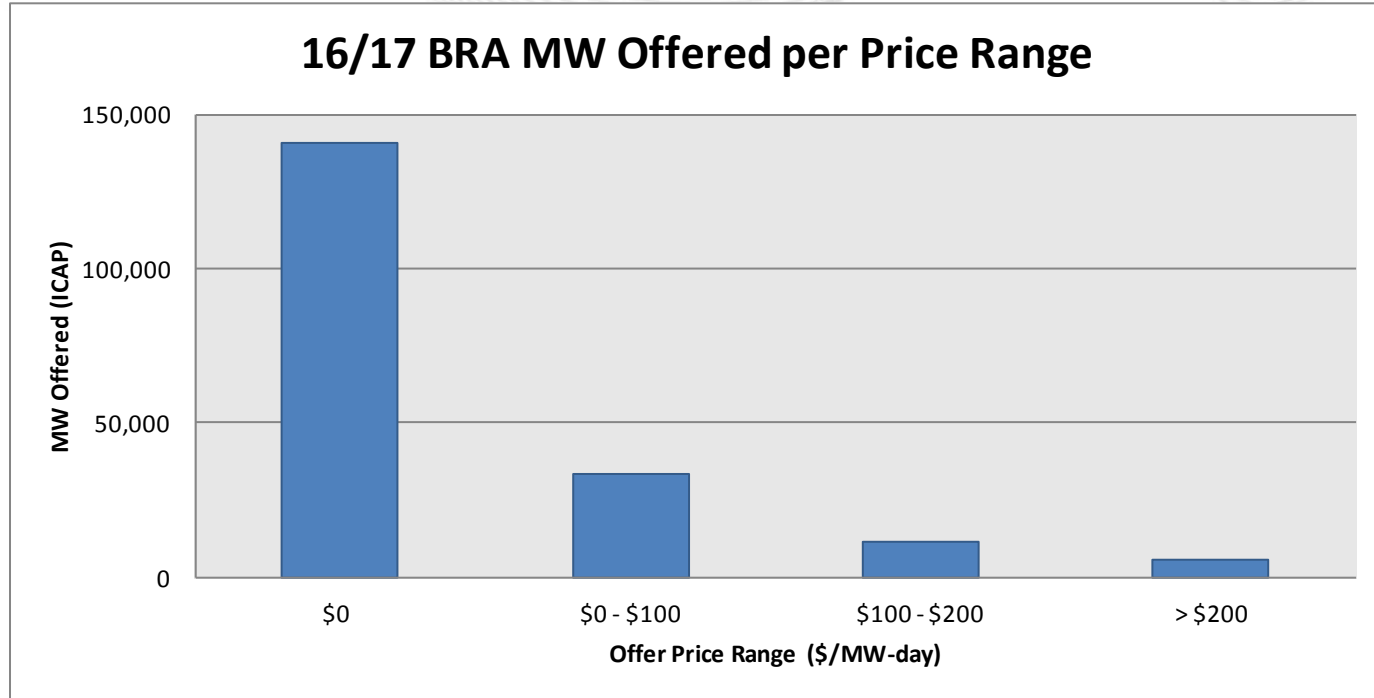
Sources: Carroll County Energy OO 13-1752-EL-BGN; NTE OO 14-0534-EL-BGN; Oregon Clean Energy OO 12-2959-EL-BGN; AMP Generating Station OO 06-1358-EL-BGN; Rolling Hills 12-1669-EL-BGA; Clean Energy Future-Lordstown OO 14-2322-EL-BGN; South Field Energy LLC 15-1716-EL-BGN; ABB Velocity Suite Products.
Note: Proposed AMP Natural Gas Combined Cycle (960 MW) is not depicted; its status is uncertain.

IMPACT OF A SUBSIDY ON PJM RPM CAPACITY MARKET





Capacity Resource Offer Prices for 2016/17 Delivery Year



**PERCENTAGE OF PJM HIGHEST LOAD HOURS WHEN PPA GENERATION UNITS WERE
EITHER NOT GENERATING OR GENERATING AT LESS THAN 75% OF RATED CAPACITY
(2007 - 2015)**

Unit	Summer		Winter	
	Non-Generating	Generating < 75% of Rated Capacity	Non-Generating	Generating < 75% of Rated Capacity
Cardinal 1	16.1%	7.2%	35.0%	5.0%
Clifty Creek 1	11.7%	1.1%	1.9%	0.0%
Clifty Creek 2	10.6%	0.0%	15.0%	0.6%
Clifty Creek 3	13.3%	3.3%	11.9%	0.0%
Clifty Creek 4	8.3%	8.9%	12.2%	0.6%
Clifty Creek 5	21.7%	1.1%	15.0%	3.3%
Clifty Creek 6	14.4%	3.9%	6.7%	0.6%
Conesville 4	31.7%	17.8%	38.8%	3.1%
Conesville 5	3.9%	7.8%	6.1%	2.8%
Conesville 6	6.7%	5.6%	6.7%	15.6%
Davis Besse 1	0.0%	0.0%	0.0%	10.0%
J M Stuart 1	20.6%	5.0%	6.7%	8.3%
J M Stuart 2	9.4%	16.7%	12.8%	24.4%
J M Stuart 3	11.1%	0.0%	21.7%	15.0%
J M Stuart 4	25.0%	10.0%	15.0%	6.1%
Kyger Creek 1	0.0%	1.7%	18.3%	9.4%
Kyger Creek 2	12.2%	3.3%	16.7%	1.7%
Kyger Creek 3	10.6%	1.7%	12.8%	4.4%
Kyger Creek 4	16.7%	5.6%	10.0%	11.7%
Kyger Creek 5	7.2%	5.0%	2.8%	2.8%
W H Sammis 1	1.1%	6.7%	3.3%	6.7%
W H Sammis 2	6.7%	6.7%	3.3%	5.0%
W H Sammis 3	1.7%	3.9%	3.3%	6.7%
W H Sammis 4	0.0%	12.8%	18.9%	8.9%
W H Sammis 5	0.6%	8.9%	14.4%	12.2%
W H Sammis 6	0.0%	0.0%	19.4%	2.2%
W H Sammis 7	11.1%	4.4%	5.6%	8.3%
W H Zimmer ST1	5.6%	3.9%	16.1%	5.0%

Notes: Highest load hours defined as top 20 PJM load hours for each summer and winter season from 2007 through 2015. Output data are missing for Clifty Creek units 1-3 for 2013 Q1 and Conesville 4 for 2012 Q4 and 2013 Q1.

Appendix A

**CURRICULUM VITAE****Joseph Cavicchi**

OFFICE: Compass Lexecon
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Boston, MA 02109
(617) 520-0200 main
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PROFESSIONAL EXPERIENCE

Compass Lexecon, Boston, MA
Executive Vice President, April 2013 – present
Senior Vice President, January 2007 – March 2013
Managing Director, 2003 – 2006
Vice President, 2001 – 2003
Senior Consultant, 1999 – 2001
Consultant, 1997 – 1999

Provides wholesale and retail electricity market regulatory economic analyses in connection with the restructuring of the US electricity industry. In particular, he advises clients in Federal Energy Regulatory Commission matters, state regulatory proceedings, and arbitration and court proceedings. He files testimony, affidavits and expert reports supported by economic analyses.

Extensive knowledge of wholesale market operations with general economic theory of contracting and electricity generation plant dispatch that provides companies with detailed analyses that impact both regulatory and business decisions. Actively involved in the electricity industry both before and after restructuring for a total of more than 20 years.

Tufts University, Medford, MA
Adjunct Instructor, Summer 2000

Taught graduate-level environmental economics.

Appendix A

Massachusetts Institute of Technology, Cambridge, MA

Research Engineer, 1997

Research Assistant, 1995 – 1997

Performed an analysis of water and electricity resources in Mendoza, Argentina. Developed a computer simulation model to support analysis and permit the display of results to a diverse group of stakeholders. Traveled frequently to Mendoza to interact with government officials and relevant institutions in an effort to establish electricity and water policy.

Massachusetts Institute of Technology, Cambridge, MA

Project Manager/Staff Mechanical Engineer, 1989 – 1995

Managed the development, engineering, and construction of a \$40 million, 20 MW gas turbine-based cogeneration facility at the Cambridge campus. Directed all attributes of the project for its three-year duration. Involved extensively in energy conservation programs with emphasis on building and utility plant optimization through innovative engineering applications.

Carrier Building Systems and Services, Waltham, MA

Project Engineer, 1987 – 1988

Engineered and managed the installation of Energy Management Systems used exclusively for demand-side management. Interfaced direct digital control systems to mechanical equipment associated with thermal systems of industrial, commercial, and educational buildings.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

S.M. in Technology Policy, 1997

Tufts University, Medford, MA

S.M. in Environmental Engineering, 1992

University of Connecticut, Storrs, CT

B.S. in Mechanical Engineering, 1987

Appendix A

TESTIMONY

PJM Power Providers Group

Before the Public Utilities Commission of Ohio, In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider, Case No. 14-1693-EL-RHR et al. Supplement Testimony of A. Joseph Cavicchi on behalf of the PJM Power Providers Group and The Electric Power Supply Association, December 28, 2015, Written, public and Confidential. Deposition of A. Joseph Cavicchi on behalf of the PJM Power Providers Group and The Electric Power Supply Association, January 5, 2016. Deposition Testimony of A. Joseph Cavicchi, January 5, 2016. Testimony of A. Joseph Cavicchi, January 7, 2016, Oral, Public.

Exelon Generation Company, LLC

Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services, Into Markets Operated by the California, Independent System Operator Corporation, And the California Power Exchange, Docket EL 00-95-280 et al. Affidavit of A. Joseph Cavicchi in Support of the Exelon Generation Company, LLC's Fuel Cost Allowing Filing, December 4, 2015, Written, Public.

PJM Power Providers Group

Before the Public Utilities Commission of Ohio, In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider, Case No. 14-1693-EL-RHR et al. Direct Testimony of A. Joseph Cavicchi on behalf of the PJM Power Providers Group and The Electric Power Supply Association, September 11, 2015, Written, Public and Confidential. Testimony of A. Joseph Cavicchi on behalf of the PJM Power Providers Group and The Electric Power Supply Association, October 20, 2015, Oral, Public.

Iberdrola Renewables, LLC

Before the Federal Energy Regulatory Commission, Docket Nos. EL02-60-007 and EL02-62-006, consolidated . Prepared Answering Testimony of A. Joseph Cavicchi on behalf of Iberdrola Renewables, LLC, July 21, 2015 Written, Public & Confidential. Deposition of A. Joseph Cavicchi on behalf of the Iberdrola Renewables, LLC, September, 24, 2015, Oral, Confidential. Testimony of A. Joseph Cavicchi, December 3, 2015, Oral, Public.

San Diego Gas and Electric Company

Naturener USA, LLC, et al. v. San Diego Gas & Electric Company, in the Montana Ninth Judicial District Court, Toole County. Declaration, Non-Public (January 22, 2014).

PPL EnergyPlus

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Before the Federal Energy Regulatory Commission. RE : Triennial Market-Based Rate Update for the Northeast Region, PPL Electric Utilities Corporation et al, Dockets ER 10-2010 et al. Affidavit of A. Joseph Cavicchi, December 31, 2013, Written, Public.

Before the Federal Energy Regulatory Commission. RE : Triennial Market-Based Rate Update for the Northwest Region, PPL EnergyPlus LLC et al, Dockets ER 10-2011 et al. Affidavit of A. Joseph Cavicchi, December 31, 2013, Written, Public.

Transalta Energy Marketing

Before the Federal Energy Regulatory Commission, Puget Sound Energy, Inc., Complainant v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest, Including Parties to the Western System Power Pool Agreement Participants, Docket. No. EL01-085. Prepared Answering Testimony of A. Joseph Cavicchi on behalf of Transalta Energy Marketing (U.S.) Inc. and Transalta Energy Marketing (California) Inc., December 17, 2012. Deposition of A. Joseph Cavicchi on behalf of Transalta Energy Marketing (California) Inc., February 8, 2013. Testimony of A. Joseph Cavicchi, October 21 and 22, 2013, Oral, Public.

Avista Corporation et al

Before the Federal Energy Regulatory Commission. In the Matter of Puget Sound Energy, Inc. v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest, including Parties to the Western Systems Power Pool Agreement. Docket EL01-10-085. Testimony of A. Joseph Cavicchi, September 26, 2013. Oral, public. Answering Testimony of A. Joseph Cavicchi on behalf of Avista Corporation et al. ("Joint Defense Group"), June 24, 2013. Deposition of A. Joseph Cavicchi on behalf of Avista Corporation et al, July 9, 2013.

Department of Justice

Before the United States Court of Federal Claims, Pacific Gas and Electric Company and Southern California Edison Company, Plaintiffs et al v. The United States, Defendant, No. 07-157C, No. 07-167C (Consolidated), No. 07-184C. Deposition of A. Joseph Cavicchi, March 27, 2013. Confidential, Subject to Protective Order.

Before the United States Court of Federal Claims, Pacific Gas and Electric Company and Southern California Edison Company, Plaintiffs et al v. The United States, Defendant, No. 07-157C, No. 07-167C (Consolidated), No. 07-184C. Expert Report of A. Joseph Cavicchi, March 1, 2013. Confidential, Subject to Protective Order.

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PPL Montana and PPL EnergyPlus

Before the Federal Energy Regulatory Commission, Puget Sound Energy, Inc., Complainant v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest, Including Parties to the Western System Power Pool Agreement Participants, Docket No. EL01-085. Prepared Answering Testimony of A. Joseph Cavicchi on behalf of PPL Montana and PPL EnergyPlus, December 17, 2012. Written, Public. Deposition of A. Joseph Cavicchi on behalf of PPL Montana and PPL EnergyPlus, February 8, 2013.

Constellation New Energy

Before the Federal Energy Regulatory Commission, Puget Sound Energy, Inc., Complainant v. All Jurisdictional Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest, Including Parties to the Western System Power Pool Agreement Participants, Docket No. EL01-085. Prepared Answering Testimony of A. Joseph Cavicchi on behalf of Constellation Energy Commodities Group, December 17, 2012. Written, Public. Deposition of A. Joseph Cavicchi on behalf of Constellation Energy Commodities Group, February 8, 2013.

Constellation NewEnergy

Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company, Complainant, v. Sellers of Energy and Ancillary Services into Markets Operated by the CA ISO and CA Power Exchange, et al., Respondents, Docket No. EL00-95-248. Direct Testimony and Exhibits of Constellation NewEnergy, Inc. Testimony of A. Joseph Cavicchi on behalf of Constellation NewEnergy, July 11, 2012. Oral, Public.

PPL Electric Utility Corporation

Before the Pennsylvania Public Utility Commission, Docket No. P-2012-2302074, PPL Electric Utility Corporation. Statement No. 2. Direct Testimony of A. Joseph Cavicchi, May 16, 2012. Statement No. 2-R. Direct Testimony of A. Joseph Cavicchi, August 17, 2012. Statement No. 3. Testimony of A. Joseph Cavicchi, September 10, 2012. Oral, Public.

PPL Corporation

Before the Federal Energy Regulatory Commission, RE: Notice of Change in Status Regarding Market-Based Rate Authority, Docket No. ER10-2016-___ et al. Affidavit of A. Joseph Cavicchi on behalf of PPL Corporation, January 30, 2012. Written, Public.

Entegra Power Services, LLC

Before the Federal Energy Regulatory Commission, Union Power Partners LP, Docket No. ER05-1191-016, Entegra Power Services LLC, Docket No. ER09-838-002. Updated Market Power Analysis for Market-Based Rates. Affidavit of A. Joseph Cavicchi, December 29, 2011.

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Constellation NewEnergy, Inc.

Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company, Complainant, v. Sellers of Energy and Ancillary Services into Markets Operated by the CA ISO and CA Power Exchange, et al., Respondents, Docket No. EL00-95-248. Direct Testimony and Exhibits of Constellation NewEnergy, Inc. Direct and Answering Testimony and Exhibits of A. Joseph Cavicchi on behalf of Constellation NewEnergy, October 25, 2011. Written, Public.

CP Energy

Before the Federal Energy Regulatory Commission, RE: Triennial Market-Based Rate Update for the Northeast Region, Docket No. ER10-1342 et al. Affidavit of A. Joseph Cavicchi, June 30, 2011. Written, Public.

Edison Mission.

Before the Federal Energy Regulatory Commission, RE: Triennial Market-Based Rate Update for the Northeast Region, Edison Mission Marketing and Trading, et al., Docket No. ER11-____-000, et al. Affidavit of A. Joseph Cavicchi, June 29, 2011. Written, Public.

Entegra Power Services, LLC

Before the Federal Energy Regulatory Commission, Gila River Energy Supply LLC, Docket No. ER11-____-000, Request for Acceptance of Initial Market-Based Rate Tariff, Waivers and Blanket Authority Under Section 205 of the Federal Power Act. Affidavit of A. Joseph Cavicchi, April 11, 2011. Written, Public.

PPL Corporation

Before the Federal Energy Regulatory Commission, Triennial Market-Based Rate Update for the Northwest Region, PPL Northwest Companies, ER10-2011-000 et al. Affidavit of A. Joseph Cavicchi on behalf of the PPL Northwest Companies, January 31, 2011. Written, Public.

Entegra Power Services LLC

Before the Federal Energy Regulatory Commission, Gila River Power, LP, Docket No. ER05-1178-015 and Entegra Power Services LLC, Docket ER09-838-001, Second Supplement to Updated Market Power Analysis for Continued Market-Based Rate Authority in Compliance with Order No. 697. Second Supplement Affidavit of A. Joseph Cavicchi, January 12, 2011. Written, Public.

PPL Corporation

Before the Federal Energy Regulatory Commission, RE: Notice of Change of Status Regarding Market-Based Rate Authority, Docket No. ER10-1511-001 et al. Affidavit of A. Joseph Cavicchi on behalf of PPL Corporation, December 1, 2010. Written, Public.

Entegra Power Services LLC

Before the Federal Energy Regulatory Commission, Gila River Power, LP, Docket No. ER05-1178-015 and Entegra Power Services LLC, Docket ER09-

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838-001. Supplement to Updated Market Power Analysis for Continued Market-Based Rate Authority in Compliance with Order No. 697. Affidavit of A. Joseph Cavicchi, November 19, 2010. Written, Public.

Chesapeake Energy Corp., et al.

Before the Public Utilities Commission of the State of Colorado, In the Matter of Commission Consideration of Public Service Company of Colorado Plan in Compliance with House Bill 10-1365 "Clean Air Jobs Act," Docket No. 10M-245E. Testimony of A. Joseph Cavicchi on behalf of Noble Energy, Inc., Chesapeake Energy Corporation and Encana Oil & Gas (USA), November 1, 2010. Oral, Public. November 9, 2010. Written, Public. November 18, 2010. Oral, Public.

Chesapeake Energy Corp., et al.

Before the Public Utilities Commission of the State of Colorado, In the Matter of Commission Consideration of Public Service Company of Colorado Plan in Compliance with House Bill 10-1365 "Clean Air Jobs Act," Docket No. 10M-245E. Cross Answer Testimony and Exhibits of A. Joseph Cavicchi on behalf of Noble Energy, Inc., Chesapeake Energy Corporation and Encana Oil & Gas (USA), October 8, 2010. Written Report Public, Exhibits Confidential, Filed Under Seal.

Chesapeake Energy Corp., et al.

Before the Public Utilities Commission of the State of Colorado, In the Matter of Commission Consideration of Public Service Company of Colorado Plan in Compliance with House Bill 10-1365 "Clean Air Jobs Act," Docket No. 10M-245E. Answer Testimony and Exhibits of A. Joseph Cavicchi on behalf of Noble Energy, Inc., Chesapeake Energy Corporation and Encana Oil & Gas (USA), September 17, 2010. Written, Confidential.

PPL Electric Utilities Corporation

Before the Pennsylvania Public Utility Commission, RE: Petition of PPL Electric Utilities Corporation for Approval of a Default Service Program and Procurement Plan for the Period January 1, 2011 through May 31, 2014, Docket No. P-2008-2060309. Statement No. 2. Direct Testimony of A. Joseph Cavicchi on behalf of PPL Electric, September 14, 2010. Oral, Written and Public.

PPL Corporation and E.ON U.S.

Before the Federal Energy Regulatory Commission, RE: PPL Corporation and E.ON U.S. LLC Application for Authorization Under Section 203 of the Federal Power Act, Request for Waivers of Filing Requirements, and Confidential Treatment of Agreement and Workpapers, Docket No. EC10-77-000. Affidavit of Dr. Joseph P. Kalt and Mr. A. Joseph Cavicchi, June 28, 2010.

BG Masspower

Before the Commonwealth of Massachusetts Trial Court, Suffolk, SS, Civil Action 07-3243 (BLS2), Masspower, by its General Partners, BG MP Partners I, LLC, and BG MP Partners II, LLC, Plaintiffs, v. Massachusetts Municipal Wholesale Electric

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Company, Defendant. Deposition of A. Joseph Cavicchi on behalf of Masspower, February 19, 2010. Testimony of A. Joseph Cavicchi on behalf of Masspower, March 18 and 19, 2010. Oral, Public.

Allegheny

Before the Federal Energy Regulatory Commission, State of California ex rel. Lockyer v. British Columbia Power Exchange Corp., et al., Docket No. EL02-71-017 et al. Prepared Answering Testimony of A. Joseph Cavicchi on behalf of Allegheny Energy, September 17, 2009. Written, Public.

MPS Merchant Services

Before the Federal Energy Regulatory Commission, State of California ex rel. Lockyer v. British Columbia Power Exchange Corp., et al., Docket No. EL02-71-017. Prepared Answering Testimony of A. Joseph Cavicchi on behalf of MPS Merchant Services, September 17, 2009. Written, Public.

PPL Montana, LLC

Before the Federal Energy Regulatory Commission, State of California ex rel. Lockyer v. British Columbia Power Exchange Corp., et al., Docket No. EL02-71-017. Answering Testimony of A. Joseph Cavicchi on behalf of PPL Montana, LLC, September 17, 2009. Written, Public.

Constellation New Energy

Before the Federal Energy Regulatory Commission, San Diego Gas and Electric Co. v. Sellers of Energy and Ancillary Services, Docket No. EL00-95 et al. Affidavit of A. Joseph Cavicchi on behalf of Constellation New Energy, August 4, 2009. Written, Public.

Energy Northwest

Before the American Arbitration Association, Seattle, Washington, Grays Harbor Energy LLC, Claimant, Energy Northwest, Respondent, Case No. 75-158-115-08. Testimony of A. Joseph Cavicchi on behalf of Energy Northwest, June 18, 2009. Oral, Public. Deposition Testimony of A. Joseph Cavicchi on behalf of Energy Northwest, May 13, 2009. Oral, Public. Supplemental Expert Report of A. Joseph Cavicchi on behalf of Energy Northwest, April 30, 2009. Written, Confidential. Expert Report of A. Joseph Cavicchi on behalf of Energy Northwest, April 15, 2009. Written, Confidential

Entegra Power Services LLC

Before the Federal Energy Regulatory Commission, Docket ER09-838-000, Request for Acceptance of Initial Market-Based Rate Tariff, RE: Updated Market Power Analysis for EPS' Affiliate, Gila River. Affidavit of A. Joseph Cavicchi, March 13, 2009. Written, Public.

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Union Pacific Railroad Company

In the Matter of the Arbitration between Wisconsin Public Service Corporation and Union Pacific Railroad Company. Rebuttal Expert Report of A. Joseph Cavicchi, February 16, 2009.

PPL Electric Utilities Corporation

Before the Pennsylvania Public Utility Commission, RE: Petition of PPL Electric Utilities Corporation for Approval of a Default Service Program and Procurement Plan for the Period January 1, 2001 through May 31, 2014, Docket No. P-2008-2060309. Testimony of A. Joseph Cavicchi on behalf of PPL Electric Utilities Corporation, February 11, 2009. Oral, Public.

PPL Electric Utilities Corporation

Before the Pennsylvania Public Utility Commission, Docket No. P-2008-2060309. Rebuttal Testimony of A. Joseph Cavicchi on behalf of PPL Electric Utilities Corporation, January 20, 2009.

Union Power Partners, L.P.

United States of America, Before the Federal Regulatory Commission, Docket No. ER05-1191-014, Updated Market Power Analysis for Continued Market-Based Rate Authority. Affidavit of A. Joseph Cavicchi on behalf Union Power Partners, L.P., December 30, 2008.

PPL Electric Utilities Corporation

Before the Pennsylvania Public Utility Commission, Docket No. P-2008-2060309, Supplemental Testimony of A. Joseph Cavicchi of behalf of PPL Electric Utilities Corporation, November 3, 2008.

PPL Electric Utilities Corporation

Before the Pennsylvania Public Utility Commission, Docket No. P-2008-2060309. Testimony of A. Joseph Cavicchi of behalf of PPL Electric Utilities Corporation, September 11, 2008.

PPL Electric Utilities Corporation

United States of America, Before the Federal Regulatory Commission, Docket No. ER00-1712-008, ER02-2408-003, ER00-744-006, ER02-1327-005, ER00-1703-003, ER02-1749-003, ER02-1747-003, ER99-4503-005, ER00-2186-003, ER01-1559-004. Affidavit of A. Joseph Cavicchi on behalf of PPL Companies, September 2, 2008.

PPL Electric Utilities Corporation

United States of America, Before the Federal Regulatory Commission, Docket No. EL08-67-000. Affidavit of A. Joseph Cavicchi (with Joseph P. Kalt) on behalf of PPL Companies, August 12, 2008.

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PPL Electric Utilities Corporation

United States of America, Before the Federal Regulatory Commission, Docket No. EL08-67-000. Affidavit of A. Joseph Cavicchi (with Joseph P. Kalt) on behalf of PPL Companies, July 11, 2008.

Entegra Power Group L.L.C.

United States of America, Before the Federal Regulatory Commission, Docket Nos. ER05-1178-00 and ER05-1191-00. Affidavit of A. Joseph Cavicchi on behalf of Entegra Power Group L.L.C, Gila River Power, L.P., Union Power Partners, L.P., Harbinger Capital Partners Master Fund I, Ltd., and Harbinger Capital Partners Special Situations Fund, LP, May 30, 2008.

Harbinger

United States of America, Before the Federal Regulatory Commission, Docket No. EC08-87-000. Affidavit of A. Joseph Cavicchi on behalf of the Entegra Power Group L.L.C, Gila River Power, L.P., Union Power Partners, L.P., Harbinger Capital Partners Master Fund I, Ltd., and Harbinger Capital Partners Special Situations Fund, LP, May 9, 2008.

IEPA

United States of America, Before the Federal Regulatory Commission, Docket Nos. ER08-556-000 and ER06-615-020. Affidavit of A. Joseph Cavicchi on behalf of Independent Energy Producers Association, February 29, 2008.

PJM Power Providers Group

United States of America, Before the Federal Regulatory Commission, Docket No. EL08-34-000. Affidavit of Joseph P. Kalt and A. Joseph Cavicchi on behalf of the P3 Group, responding to the Complaint of the Maryland Public Service Commission against PJM Interconnection, L.L.C., regarding marketing power mitigation, February 19, 2008.

Tractebel Energy Marketing, Inc.

Tractebel Energy Marketing, Inc. v. AEP Power Marketing, Inc., American Electric Power Company, Inc. and Ohio Power Company, 03 CV 6731 (S.D.N.Y.) (HB) (JCF); and Ohio Power Company and AEP Power Marketing, Inc. v. Tractebel Energy Marketing, Inc. and Tractebel S.A., 03 CV 6770 (S.D.N.Y.) (HB) (JCF). Expert Report of A. Joseph Cavicchi on behalf of Tractebel Energy Marketing, Inc., January 21, 2008.

PPL Corporation

United States of America, Before the Federal Regulatory Commission, Docket Nos. ER00-1712-007, ER02-2408-003, ER00-744-006, ER02-1327-005, ER00-1703-002, ER02-1749-003, ER02-1747-003, ER99-4503-005, ER00-2186-003, ER01-1559-004. Affidavit of A. Joseph Cavicchi on behalf of Triennial Market Power Update of PPL Companies, January 14, 2008.

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IEPA

United States of America, Before the Federal Regulatory Commission, Docket Nos. ER06-615-003, 005, 012, ER07-1257-000, ER02-1656-017, ER02-1656-018, EL05-146-000 and EL08-20-000. Affidavit of A. Joseph Cavicchi on behalf of Independent Energy Producers Association, January 9, 2008.

NRG

United States of America, Before the Federal Regulatory Commission, New York Independent System Operator – Docket No. EL07-39-000. Affidavits of A. Joseph Cavicchi on behalf of NRG Power Marketing, Inc., Arthur Kill Power LLC, Astoria Gas Turbine Power LLC, Dunkirk Power LLC, Huntley Power LLC, and Oswego Harbor Power LLC, November 19, 2007, December 10, 2007, and December 21, 2007. Written, Public.

American Electric Power Services Corporation, Conectiv Energy Supplies, Inc., DTE Energy Trading, Inc., Energy America, LLC, Integrys Energy Services, Inc., and PPL Energy Plus, LLC

United States of America, Before the Federal Regulatory Commission, The People of the State of Illinois, ex rel. Illinois Attorney General Lisa Madigan v. Exelon Generation Co., LLC, et al., Docket No. EL07-47-000. Affidavit of Joseph Cavicchi and Joseph P. Kalt, June 18, 2007. Written, Public.

Independent Energy Producers Association of California

United States of America, Before the Federal Regulatory Commission, Docket No. R.06-02-013, Long-Term Procurement Plans, Prepared Testimony of the Independent Energy Producers Association. Prepared Testimony of Joseph Cavicchi and David Reishus on behalf of the IEPA, March 2, 2007. Written, Public.

Cross Hudson

Before the State Of New York Public Service Commission, Request of Hudson Transmission Partners, LLC, for Unredacted Copies of Records Filed In Case 01-T-1474. Affidavit of Joseph Cavicchi in Support of Cross Hudson Corporation's Appeal of Records Access Officer's February 9, 2007, Determination (Trade Secret 07-1), February 21, 2007. Written, Public.

PPL Electric Utilities Corporation

Before The Pennsylvania Public Utility Commission, RE: Petition of PPL Electric Utilities Corporation for Approval of A Competitive Bridge Plan, Docket No. P-00062227. Direct Testimony of Joseph Cavicchi, December 19 and 20, 2006. Oral, Public.

PPL Electric Utilities Corporation

Before The Pennsylvania Public Utility Commission, RE: Petition of PPL Electric Utilities Corporation for Approval of A Competitive Bridge Plan, Docket No. P-00062227. Reply to Surrebuttal Testimony of Marjorie R. Philips, Joseph Cavicchi, December 20, 2006. Written, Public.

Appendix A

PJM Interconnect, LLC

United States of America, Before the Federal Regulatory Commission, Docket No. EL05-148-000, 001; Docket No. ER05-1410-000, 001, Initial Comments of the PPL Parties and the PSEG Companies in Opposition to Proposed Settlement, Exhibit D-1 (Exhibit AJC-1). Affidavit of A. Joseph Cavicchi, October 19, 2006. Written, Public.

Excelsior Energy Inc.

Before The Minnesota Office Of Administrative Hearings, RE: In The Matter Of The Petition Of Excelsior Energy Inc. And Its Wholly-Owned Subsidiary MEP-I, LLC For Approval Of Terms And Conditions For The Sale Of Power From Its Innovative Energy Project Using Clean Energy Technology Under Minn. Stat. §216B.1694 and a Determination That The Clean Energy Technology Is Or Is Likely To Be A Least-Cost Alternative Under Minn. Stat. §216B.1693, MPUC Docket No. E-6472-/M-05-1993; OAH Docket No. 12-2500-17260-2, Prepared Rebuttal Testimony and Exhibits of Excelsior Energy Inc. and MEP-I LLC. Rebuttal and Exhibits of Joseph Cavicchi, October 10, 2006. Written, Confidential.

PPL Electric Utilities Corporation

Before The Pennsylvania Public Utility Commission, RE: Petition of PPL Electric Utilities Corporation for Approval of A Competitive Bridge Plan, Docket No. P-00062227. Statement No. 2, Direct Testimony of Joseph Cavicchi, September 15, 2006. Written, Public.

Independent Energy Producers Association of California

United States of America, Before the Federal Regulatory Commission, Docket No. EL05-146-000, Reply Comments of the Independent Energy Producers Association, September 26, 2006. Affidavit of Joseph Cavicchi, August 26, 2006. Written, Public.

Independent Energy Producers Association of California

United States of America, Before the Federal Regulatory Commission, Docket No. EL05-146-000, Affidavit in Support of Justness and Reasonableness of the Offer of Settlement's Reference Resource's Cost and Performance Characteristics. Affidavit of Joseph Cavicchi, August 21, 2006. Written, Public.

PPL Maine, LLC

United States of America, Before the Federal Regulatory Commission, RE: PPL Maine, LLC, Docket No. ER00-2186-002, Triennial Market-Based Rate Update. Affidavit of A. Joseph Cavicchi on behalf of the PPL Companies, June 19, 2006. Written, Public.

FirstEnergy Solutions Corp.

United States of America, Before the Federal Regulatory Commission, FirstEnergy Solutions Corp., Docket No. ER06-117-000. Prepared Direct Testimony of Scott T. Jones, Ph.D., and A. Joseph Cavicchi on behalf of FirstEnergy Solutions Corporation, March 15, 2006, confirming the auction price result of the Competitive Bidding

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Process carried out by the Ohio Public Utilities Commission in December 2004, and establishing that Solutions is not charging a rate greater than market prices for wholesale electricity sold to its affiliated Ohio based regulated distribution companies.

PPL Montana, LLC

United States of America, Before the Federal Energy Regulatory Commission, RE: PPL Montana, LLC, Docket No. ER99-3491-003; PPL Colstrip I, LLC, Docket No. ER00-2184-001; PPL Colstrip II, LLC, Docket No. ER00-2185-001; Answer of the PPL Montana Parties to Montana Consumer Counsel's New Uncommitted Capacity Pivotal Supplier Analysis and Uncommitted Capacity Market Share Analysis. Affidavit (filed with Joseph Kalt), February 28, 2005; Affidavit (filed with Joseph Kalt), November 14, 2005 (original October 31, 2005); First Supplemental Affidavit on behalf of the PPL Montana Parties (filed with Joseph Kalt), December 23, 2005; Affidavit (filed with Joseph Kalt), February 1, 2006.

PPL Corporation

United States of America, Before the Federal Energy Regulatory Commission, Triennial Market-Based Rate Update, Submitted by PPL Great Works, Docket No. ER05-4503-004. Affidavit, January 24, 2006.

Independent Energy Producers Association of California

Before the Public Utilities Commission of the State of California, Evidentiary Hearings, Dockets Nos. R04-04-025 and R04-04-003. Testimony of Joseph Cavicchi and David Reishus on behalf of Independent Energy Producers Association of California, January 23 and 24, 2006. Oral, Public.

PPL Corporation

United States of America, Before the Federal Energy Regulatory Commission, Docket No. ER05-1416-000. Affidavit of A. Joseph Cavicchi, Joseph P. Kalt, Ph.D., and David A. Reishus, Ph.D., on behalf of the PPL Parties, October 19, 2005.

Independent Energy Producers Association of California

United States of America, Before the Federal Energy Regulatory Commission, Docket No. EL05-146-000. Affidavit in Support of the Complaint of the Independent Energy Producers Association to Implement CAISO Market Design Modifications, August 26, 2005.

PPL Corporation

United States of America, Before the Federal Energy Regulatory Commission, PPL Resource Adequacy Market Proposal, Docket No. PL05-7-000. "A Policy Analysis of PJM's Proposed Four-Year Forward Capacity Market" (with Joseph P. Kalt), June 16, 2005.

PPL EnergyPlus

United States of America, Before the Federal Energy Regulatory Commission, Docket ER00-1712-004, Request for Leave to Respond and Response of PPL Parties to

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Protest of PJM Industrial Customer Coalition and the PP&L Industrial Customer Alliance and to Comments of Joint Consumer Advocates. Supplemental Affidavit, December 16, 2004.

PPL Montana, LLC

United States of America, Before the Federal Energy Regulatory Commission, RE: PPL Montana, LLC; PPL Colstrip I, LLC; PPL Colstrip II, LLC; Docket No. ER99-3491-__, Compliance Filing: Triennial Market-Based Rate Update and Revised Tariff Sheet. Affidavit (filed with Joseph Kalt), November 9, 2004.

United States of America, Before the Federal Energy Regulatory Commission, PPL Colstrip I, LLC; PPL Colstrip II, LLC; Docket No. ER99-3491-003, market power analysis in support of application for renewal of authority to sell electric energy and capacity at market-based rates. Affidavit (filed with Joseph Kalt), November 9, 2004.

PPL EnergyPlus

United States of America, Before the Federal Energy Regulatory Commission, PPL EnergyPlus et al., Docket ER00-1712-004, market power analysis in support of application for renewal of authority to sell electric energy and capacity at market-based rates. Supplemental Affidavit, November 9, 2004.

PPL Southwest Generation Holdings, LLC

United States of America, Before the Federal Energy Regulatory Commission, PPL Southwest Generation Holdings, LLC, Docket No. ER01-1870-002, market power analysis in support of application for renewal of authority to sell electric energy and capacity at market-based rates. Supplemental Affidavit, October 25, 2004.

PPL Wallingford Energy LLC

United States of America, Before the Federal Energy Regulatory Commission, PPL Wallingford Energy LLC, Docket No. ER01-1559-002, market power analysis in support of application for renewal of authority to sell electric energy and capacity at market-based rates. Supplemental Affidavit, October 8, 2004.

PPL Wallingford Energy LLC

United States of America, Before the Federal Energy Regulatory Commission, PPL Wallingford Energy LLC, Docket No. ER01-1559-002, market power analysis in support of application for renewal of authority to sell electric energy and capacity at market-based rates. Affidavit, July 12, 2004.

PPL Southwest Generation Holdings, LLC

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Appendix A

PPL Wallingford Energy LLC

United States of America, Before the Federal Energy Regulatory Commission, PPL Wallingford Energy LLC and PPL EnergyPlus, LLC, Petition for Rehearing, Request for Clarification and Request for Expedited Action on Rehearing and Clarification of PPL Wallingford Energy LLC and PPL EnergyPlus, LLC. Affidavit, June 16, 2003.

Massachusetts Department of Telecommunications and Energy

Submission of comments on the investigation by the Massachusetts DTE on its own motion into the Provision of Default Service, DTE 02-40-B (with Charles Augustine), May 28, 2003.

BUSINESS STRATEGY ANALYSES

Electricity Generation Facility Developers

Oversees the development and implementation of transmission-constrained dispatch modeling for proposed electricity generation units locating in the Northeastern, Mid-Atlantic, and Midwestern United States. Analyses typically focus on determining likely facility capacity factors and impacts on local and regional air pollutant emissions as well as on wholesale electricity prices. In addition, these analyses provide detailed knowledge of new facilities' impacts on the operation of the electricity transmission system that is critical to assessing the ability of a generating unit to deliver its power in a wide geographical area.

Electricity Distribution Companies

Provide extensive strategic advice and analytical support to electricity distribution companies that are required to assess new wholesale marketplaces in order to fulfill their regulatory commitments as providers of last resort or default electricity service. In most instances these companies require assistance with the development and issuance of requests for proposals as well as rapid evaluation of commodity bids. The assignments combine extensive knowledge of wholesale market operations with general economic theory of contracting and electricity generation plant dispatch in order to provide companies with an approach to commodity procurement that agrees with their risk profile. In most cases there are numerous business and regulatory concerns that are incorporated into the procurement strategies. Additionally, each assignment typically requires extensive analysis of customer demand patterns and wholesale market prices in order to develop market-based customer service cost forecasts.

PUBLICATIONS

Economists' Amici Brief to the United States Supreme Court (In re: Long-Term Contracts for Energy Markets, No. 14-614, 14-623; with Gilbert, Richard J., et al.), January 19, 2016.

Appendix A

“The Polar Vortex: Implications for Improving the Efficiency of Wholesale Electricity Spot Market Pricing,” A. Joseph Cavicchi, March 2014. Prepared for the Electric Power Supply Association.

“Anatomy of Sealed-Bid Auctions. Bringing Flexibility and Efficiency to Energy RFPs,” with Andrew Lemon, published in *Public Utilities Fortnightly*, June 2009, pp. 20-64.

“U.S. Centralized Wholesale Electricity Markets: An Update,” published in the *International Association for Energy Economics Newsletter*, First Quarter 2007, pp. 8-12.

“Power Procurement. What’s in Your Mix? Why Competitive Markets Are Scaring Regulators,” with Andrew Lemon, published in *Public Utilities Fortnightly*, November 2006, pp. 49-54.

“Competition and Regulation in the Power Industry, Part III: Tensions Evolve Between Regulation and Competition,” with Charles Augustine and Joseph Kalt, published in *Electric Light & Power*, January/February 2006: volume 84.01, pp. 24-25.

“Gradualism in Retail Restructuring.” with Charles Augustine and Joseph P. Kalt, published in *Electric Light & Power*, September/October 2005: volume 83:05, pp. 26-30.

“Competition and Regulation in the Power Industry: Can the Two Coexist?,” with Charles Augustine and Joseph Kalt, published in *Electric Light & Power*, July/August 2005: volume 83.04, pp. 28-31.

“Ensuring The Future Construction of Electricity Generation Plants: The Challenge of Maintaining Reliability in New U.S. Wholesale Electricity Markets,” with Andrew Kolesnikov, published in *International Association for Energy Economics Newsletter*, First Quarter 2005.

“Electricity Company Affiliate Asset Transfer Self Build Policies: Renewed Regulatory Challenges,” with Scott T. Jones, The *Electricity Journal*, November 2004.

“Onward Restructuring,” *Hart Energy Markets*, September 2004, Vol. 9, No. 9, p. 64.

“Competition and Regulation in the North American Electricity Industry: Can These Two Seemingly Opposed Forces Coexist?” with Charlie Augustine and Joseph P. Kalt, published in the 24th Annual North American Conference of the USAEE/IAEE Proceedings, July 9, 2004, Washington, DC.

“Wholesale Electricity Procurement Strategies for Serving Retail Demand,” published in *International Association for Energy Economics Newsletter*, First Quarter 2004.

“Economic and Environmental Benefits of the Kings Park Energy Project: System Production Modeling Report,” with Susan F. Tierney, January 25, 2002.

Appendix A

“Economic and Environmental Benefits of the Wawayanda Energy Center: System Production Modeling Report,” with Susan F. Tierney, August 24, 2001.

“Air Pollution Reductions Resulting from the Kings Park Energy Project,” with Susan F. Tierney, January 24, 2001.

PRESENTATIONS

Mr. Cavicchi led a Congressional Staff Briefing examining section 111(d) of the Clean Air Act, Stranded Assets Panel – Focusing on the Impacts of EPA’s GHG Proposal for Existing Plants Under 111(d), Washington D.C., July 30, 2014.

Mr. Cavicchi spoke, as a part of an industry-leading panel, at a Congressional Staff Briefing regarding the financial repercussions of the EPA’s Clean Power Plan to public power plants, electric co-operatives, and merchant power plants, Stranded Assets Panel – Focusing on Financial Impacts to Public Power, Co-Ops, and Merchant Power Plants Under EPA’s 111 (d) Clean Power Plan, Washington D.C., March 2, 2015.

“Goal of Scarcity and Shortage Pricing and Performance of Existing Pricing Rules,” Federal Energy Regulatory Commission, October 28, 2014.

“Lessons Learned from Existing Scarcity and Storage Pricing Rules,” Federal Energy Regulatory Commission, October 28, 2014.

“Impacts of Offshore Caps and Market Power Mitigation,” Federal Energy Regulatory Commission, October 28, 2014.

Electricity Industry Fundamentals, EUCI, January 29-30, 2013.

“Market Power Monitoring and Mitigation in Electric Capacity Markets,” Capacity Markets: Achieving Market Price Equilibrium?, EUCI, October 4, 2012.

“Market Power Monitoring and Mitigation in Electric Capacity Markets,” Capacity Markets: Achieving Market Price Equilibrium?, EUCI, November 7, 2011.

“Economics and Regulation of Large Scale Renewable Resource Electricity System Transmission Additions,” Center for Research in Regulated Industries, Eastern Conference, Rutgers University, May 6, 2010.

“PJM’s RPM Auctions: Emerging and Unsettled Issues,” NECA Power Markets Conference, November 1, 2007.

“Locational Capacity Markets: Understanding the Upside,” New York City, July 8, 2006.

“Competition and Regulation in the North American Electricity Industry: Can These Two Seemingly Opposed Forces Coexist?,” 24th Annual North American Conference of the USAEE/IAEE, July 9, 2004, Washington, DC.

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“Merchant Transmission Investment Regimes: An Outsider’s Observations,” The East Coast Energy Group, April 16, 2004.

“Wholesale Procurement Strategies for the Restructured Electricity Markets: Experiences from the Field,” Platts First Annual Electricity Market Design Imperative, Chicago, IL, November 6, 2003.

“Power Plant Technologies and Characteristics,” The Harvard Institute for International Development’s Third Annual Program on Climate Change and Development, Cambridge, MA, June 19, 2000.

“Transmission Planning & Investment in the RTO Era,” with John Farr and Susan F. Tierney, workshop at Infocast Conference on Transmission Pricing, Chicago, IL, May 1, 2000.

“The US Market for Merchant Plants—Outlooks, Opportunities and Impediments,” CBI’s 4th Annual Profit from Merchant Plants Conference, January 31, 2000.

“Projecting Electricity Prices for a Restructured Electricity Industry,” EXNET Merchant Power Plant Conference, Washington, DC, June 3, 1999.

“Transmission Planning and Competitive Generation Markets: The New England Case,” EUCI conference on Transmission Restructuring for Retail Competition, Denver, CO, March 25, 1999.

“Key Issues in Ancillary Service Markets,” IBC’s conference on Pricing and Selling Ancillary Services in a Competitive Market Conference, San Francisco, CA, March 11, 1999.

“Successfully Forecasting the Price of Energy and Other Products,” workshop presented at IBC’s conference on Successful Load Profiling, San Francisco, CA, December 2, 1998.

“International Perspective: Lessons from the US Deregulation Experience,” Nordic Power ’98, Stockholm, Sweden, October 7, 1998.

“Successfully Forecasting the Price of Energy and Other Products in a Restructured Electric Power Industry,” workshop presented at IBC’s 3rd Strategic Forum on Market Price Forecasting, Baltimore, MD, August 24, 1998.

“Managing Market Share Loss with the Opening of Retail Markets to Competition,” Electric Utility Business Environment Conference, Denver, CO, June 24, 1998.

“Multi-Attribute Trade-Off Analysis for Water and Electricity Policy Development,” presented in Mendoza, Argentina, July 1996 and April 1997.

Appendix A

“The Basics of Cogeneration,” presented at the Tufts University Forum on Energy Conservation, December 1993.

“Implications and History of the MIT Cogeneration Project,” presented to the Massachusetts Society of Professional Engineers, November 1993.

CERTIFICATIONS

Registered Professional Engineer, Commonwealth of Massachusetts, 1992 - .

PROFESSIONAL AFFILIATIONS

Member, Board of Directors, Northeast Energy and Commerce Association, 2002-2012.

Attachment B
Form of Notice

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

**Calpine Corporation, Dynegy Inc., Eastern
Generation, LLC, Homer City Generation,
L.P., NRG Power Marketing LLC, GenOn
Energy Management, LLC, Carroll County
Energy LLC, C.P. Crane LLC, Essential
Power, LLC, Essential Power OPP, LLC,
Essential Power Rock Springs, LLC,
Lakewood Cogeneration, L.P., GDF SUEZ
Energy Marketing NA, Inc., Oregon Clean
Energy, LLC and Panda Power Generation
Infrastructure Fund, LLC,**

Docket No. EL16-____-000

Complainants,

v.

PJM Interconnection, L.L.C.,

Respondent.

NOTICE OF COMPLAINT

(March __, 2016)

Take notice that on March 21, 2016, Calpine Corporation, Dynegy Inc., Eastern Generation, LLC, Homer City Generation, L.P., NRG Power Marketing LLC, GenOn Energy Management, LLC, Carroll County Energy LLC, C.P. Crane LLC, Essential Power, LLC, Essential Power OPP, LLC, Essential Power Rock Springs, LLC, Lakewood Cogeneration, L.P., GDF SUEZ Energy Marketing NA, Inc., Oregon Clean Energy, LLC and Panda Power Generation Infrastructure Fund, LLC (Complainants) filed a formal complaint seeking fast-track processing pursuant to Sections 206 and 306 of the Federal Power Act alleging the PJM Interconnection, L.L.C. (PJM) Open Access Transmission Tariff is unjust and unreasonable because it does not include provisions to prevent the artificial suppression of prices by existing generation resources that are the beneficiaries of out-of-market revenues.

Complainants certify that copies of the complaint were served on the contacts for PJM, as listed on the Commission's list of Corporate Officials.

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing

to become a party must file a notice of intervention or motion to intervene, as appropriate. The Respondent's answer and all interventions, or protests must be filed on or before the comment date. The Respondent's answer, motions to intervene, and protests must be served on Complainants.

The Commission encourages electronic submission of protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically should submit an original and 14 copies of the protest or intervention to the Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426.

This filing is accessible on-line at <http://www.ferc.gov>, using the "eLibrary" link and is available for review in the Commission's Public Reference Room in Washington, D.C. There is an "eSubscription" link on the web site that enables subscribers to receive email notification when a document is added to a subscribed docket(s). For assistance with any FERC Online service, please email FERCOnlineSupport@ferc.gov, or call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

Comment Date: 5:00 pm Eastern Time on (insert date).

Kimberly D. Bose
Secretary

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