



Monitoring
Analytics

**Independent Market Monitor Report
on PSEG FRR 2.0
NJBPU Investigation of
Resource Adequacy Alternatives**

The Independent Market Monitor for PJM
November 23, 2020

This page intentionally left blank.

Table of Contents

Introduction.....	1
Basics of FRR 2.0	3
New Jersey Zones and LDAs.....	4
RPM Derivative Pricing.....	6
Sealed Bid Marginal Pricing	7
Impacts of FRR 2.0	8
Impacts of FRR on PJM Capacity Market Prices.....	8
Scenario 6 (RPM Derivative Pricing)	9
Scenario 7 (Sealed Bid Marginal Pricing).....	15
Market Power in FRR 2.0.....	17
Market Power under the RPM Derivative Pricing Option.....	17
Market Power under the Sealed Bid Marginal Pricing Option.....	19

Introduction

PSEG's logic for proposing an FRR is simple and incorrect. PSEG asserts that FERC's MOPR rules will increase costs to NJ customers because subsidized resources will not clear in the capacity auction and NJ will have to pay twice for the associated capacity.¹ But the New Jersey nuclear plants are the largest share of subsidized resources and PSEG agrees that the New Jersey nuclear plants will clear in the next capacity auction.² PSEG has provided no information to support its related assertion that renewables will not be competitive and not clear in the capacity auction. Citing to PJM's default offer floors is not evidence, as those floors are estimates based on antiquated technology and incomplete information, and developers of new projects can and will use the unit specific review process. Renewable developers have made clear that they can and will be competitive in the capacity auctions.³

The PSEG FRR 2.0 proposal is simply an attempt to repackage the flawed initial PSEG FRR proposal in an unsuccessful effort to address some of the fundamental issues with that proposal including the high cost to New Jersey customers and the failure to address market power, as well as the BPU's authority to implement. Although PSEG asserts that FRR 2.0 will result in New Jersey customers paying less than remaining in the capacity market, PSEG provides no supporting analysis, and PSEG admits that may not be correct.

FRR 2.0 cannot perform better than the competitive PJM market. FRR 2.0 is likely to increase costs to New Jersey customers compared to the PJM Capacity Market. FRR 2.0 imposes significant risks on New Jersey customers that the costs of FRR 2.0 could increase in expected and unexpected ways.

PSEG has provided no credible reason to abandon the competitive PJM markets. PSEG asserts repeatedly that its proposal would use the PJM Capacity Market as the benchmark for competitive pricing. There is no need to use the competitive markets as a benchmark when the competitive markets can be relied on directly. The goal of competitive markets is to reduce the costs to customers to the lowest possible level.

¹ PSEG continues to avoid providing support for its assertion that the PJM capacity market design "will inevitably result in higher costs to New Jersey customers." *See* PSEG at 6.

² Ray DePillo's response at NJ Board of Public Utilities, Recording of Work Session on Investigation of Resource Adequacy Alternatives, November 9, 2020 at 2:12. <https://www.nj.gov/bpu/about/divisions/ferc/resourceadequacy.html> .

³ "Minimum Offer Price Rule Unit-Specific Inputs," Gabel Associates; presented to the PJM MIC MOPR Special Session (February 28, 2020).

PSEG's FRR 2.0 is effectively an admission that FRR 1.0, only recently presented as a good path for New Jersey, is not a good path. PSEG's FRR 2.0 was first introduced in writing on October 2, 2020, and is presented in its entirety in about seven pages of a 20 page document.⁴ This outline is not an adequate basis for abandoning the PJM capacity market. PSEG provides no details on how the proposed FRR auctions would interact with the RPM auctions. PSEG fails to address the fact that FRR 2.0 creates new and complex incentives for market power based on the interactions between the capacity market and the FRR construct. PSEG wants a quick decision from the BPU on a dramatic change to the PJM capacity market on the basis of a badly designed, cursory and vague proposal with no meaningful empirical support for any savings for New Jersey customers.⁵ PSEG repeats that it cannot guarantee that its proposal will cost NJ customers less.⁶ FRR 2.0 is a request to leave the competitive PJM capacity market based on the unsupported assertion that a New Jersey only capacity construct would be better, regardless of the details and with unsupported and undefined assertions about how to address negative outcomes.

It is also clearly the goal to eventually expand the FRR 2.0 approach to the entire state. PSEG understates the costs of an FRR approach to the state by focusing only on the JCPL zone in FRR 2.0. A JCPL only FRR is the lowest cost FRR option. The costs of a statewide FRR would be higher. The costs of FRR 2.0 for the entire state should be evaluated prior to any decision on FRR 2.0. If FRR 2.0 were implemented for the entire state, there would be no other customers to absorb higher costs as proposed in FRR 2.0.

PSEG FRR 2.0, like FRR 1.0, does not explain why remaining in the PJM capacity market, with state subsidies, is not the least cost option, including the recognition that uneconomic offshore wind will not clear in the capacity market.⁷

FRR 2.0 does not resolve the market power concerns associated with FRR approaches. In the RPM Derivative Pricing option, PSEG relies on limiting FRR offers to offers that are contingent on clearing prices in the following PJM capacity auction. Given that one

⁴ See PSEG at 7–14.

⁵ Among a range of issues that are not addressed, the implications of PJM's filed proposal on ELCC are ignored. See FERC Docket No. ER21-278.

⁶ PSEG states that in the event "that the overall cost of the procurement exceeded the costs that the FRR service area would have paid under RPM, the Board would have the ability to recover the excess through a statewide charge under the societal benefits clause." PSEG at 10 & n.17.

⁷ PSEG overstates the cost of the offshore wind project not clearing the capacity market by using the capacity market prices from the last auction rather than the suppressed prices that PSEG recognizes would result from FRR 2.0.

typical effect of any FRR option is to suppress prices in the remaining PJM capacity market, FRR 2.0 seems clever on its face. Not only does it rely on the market power mitigation rules of the PJM Capacity Market, it operates as a mechanism to implement buyer side market power on behalf of New Jersey by suppressing prices in the PJM capacity market which form the basis for offers in the FRR. But there is no guarantee that sellers will agree to take on the risk associated with such contingent offers. If there are not enough offers, FRR 2.0 indicates that there will be bilateral contracts.⁸ There is no protection against market power in such bilateral negotiations. Under the FRR design, the New Jersey nuclear plants are exempt from the price suppressive effects of the link to the capacity auction because they will continue to receive ZECs payments to make up the difference. The New Jersey offshore wind plants are also exempt from the price suppressive effects of the link to the capacity auction because their total revenue is guaranteed. But New Jersey renewable resources are not exempt from the price suppressive effects of the link to the capacity auction because their total revenue is not guaranteed.

Market power concerns also remain under the Sealed Bid Marginal Pricing option. It is not clear how this option meets the stated goals of the FRR approach, given that carbon emitting resources can compete and clear under this option. In its market power analysis, PSEG misdefines the relevant markets and therefore incorrectly characterizes the potential supply under this option as competitive. If New Jersey were to limit competitors under this option to nuclear and renewable resources, market power would be increased further.

The best way to ensure that New Jersey customers continue to be protected from the exercise of market power and continue to receive the benefits of competitive markets is to remain in the PJM Capacity Market and continue to work to improve the PJM markets.

Basics of FRR 2.0

FRR 2.0 continues to propose that the FRR be for the JCPL Zone alone. But it is clear that FRR 2.0 is about the entire state and the FRR 2.0 rules make explicit that cost overruns will be paid by all New Jersey customers including those in other zones. Excess costs would be spread to all NJ customers using a nonbypassable charge.⁹ If FRR 2.0 were implemented for the entire state, there would be no other customers to absorb higher costs. The higher costs would be paid by New Jersey customers.

⁸ See PSEG at 10 & n.17.

⁹ See PSEG at 10 & n.17.

FRR 2.0 includes two procurement options for the JCPL Zone: RPM Derivative Pricing and Sealed Bid Marginal Pricing. Both provide the appearance of competition without the substance.

New Jersey Zones and LDAs

Table 1 shows the locational deliverability area (LDA) and parent LDA for all zones located in New Jersey. JCPL Zone is located in EMAAC LDA.

Table 1 LDA and parent LDA of New Jersey zones

Zone	LDA	Modeled LDAs	Parent LDA
AECO	AECO	Rest of EMAAC	MAAC
JCPL	JCPL	Rest of EMAAC	MAAC
PSEG	PSEG	PSEG, PSEG North	EMAAC
RECO	RECO	Rest of EMAAC	MAAC

Figure 1 is a map of the zones and modeled LDAs in New Jersey.

Figure 1 New Jersey zones and modeled LDAs

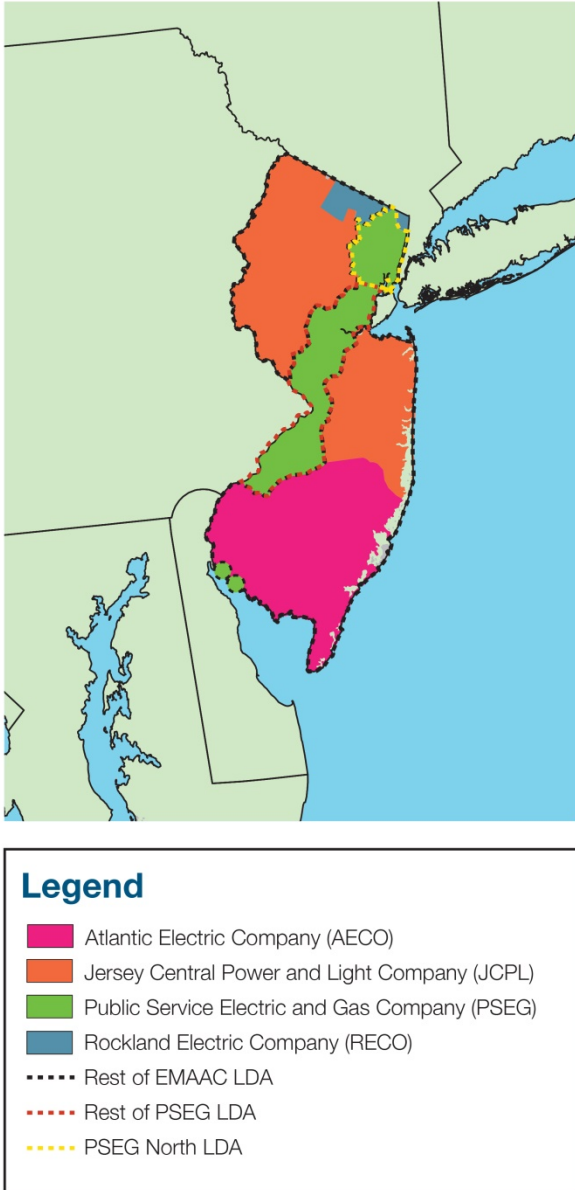
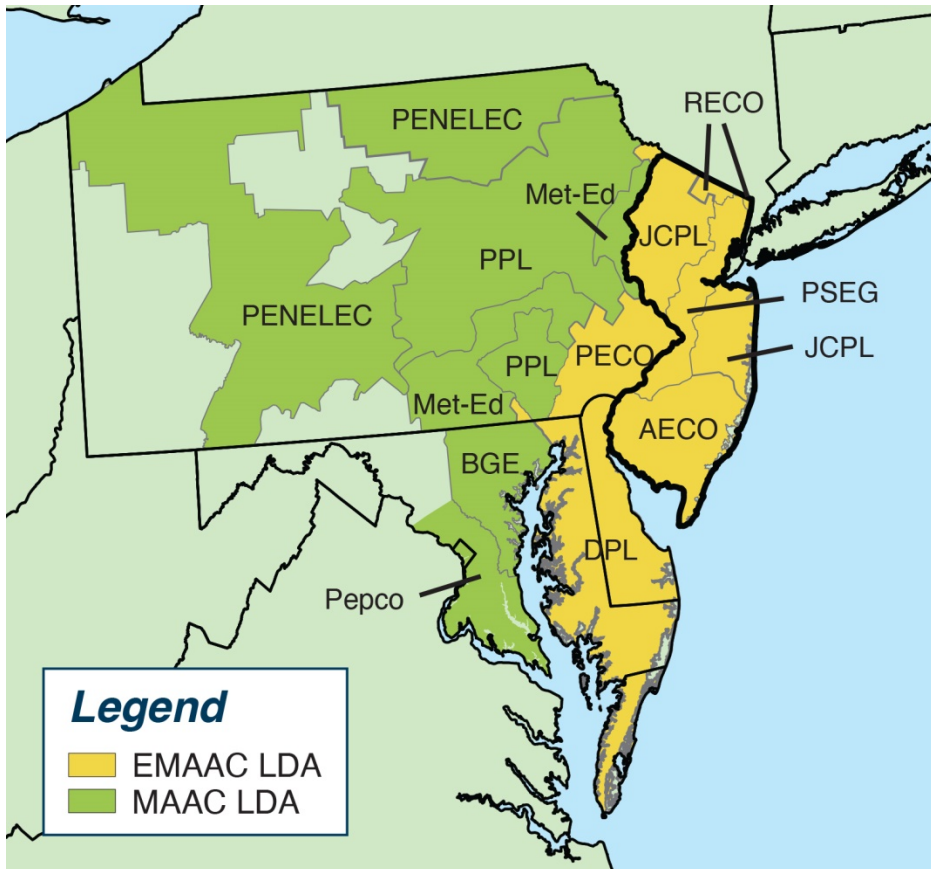


Figure 2 is a map of the EMAAC and MAAC LDAs.

Figure 2 EMAAC and MAAC locational deliverability areas



RPM Derivative Pricing

PSEG's first option, RPM Derivative Pricing, would procure capacity resources to meet JCPL's FRR Obligation through a three tier auction. In the first tier, state subsidized resources located anywhere in New Jersey would submit offers less than or equal to the unknown clearing price in the next PJM capacity market BRA for the same delivery year. The offers would be capped at 100 percent of the upcoming BRA clearing price of the LDA where the resource is located. The cleared capacity resources would be paid their offer price plus state subsidies. In the second tier, nuclear and renewable energy resources outside NJ and located in EMAAC and MAAC LDAs would submit offers, capped at 105 percent of the unknown clearing price in the next PJM capacity market BRA for the same delivery year for the LDA where the resource is located. In the third tier, all remaining resources including gas generation in JCPL and New Jersey would submit offers capped at 105 percent of the unknown clearing price in the next PJM capacity market BRA for the same delivery year for the LDA where the resource is located. The cleared capacity resources for all three tiers would be paid their offer price under the proposed pay as bid structure.

Under the RPM Derivative Pricing option, profit maximizing generators, other than PSEG, would not have sufficient incentive to offer their capacity in the JCPL FRR

procurement as a result of the price suppressive effect of the FRR on the maximum offers allowed and the risk associated with making a binding offer contingent on the outcome of a future capacity market auction. Creation of a JCPL FRR would result in lower prices in the rest of the PJM capacity market. This would result in a lower cap on allowable offers that are defined by the prices in the rest of the capacity market and would therefore result in lower prices for the resources clearing the RPM Derivative Pricing procurement. The actual offers made by other generators would be uncertain, as they are defined as a percent of the relevant RPM clearing prices which will not be known until after a generator is required to commit to the FRR.

PSEG's RPM Derivative Pricing option would result in lower prices and higher risk for all resources other than the New Jersey nuclear resources and offshore wind. Unlike nuclear resources with ZECs and offshore wind with a revenue guarantee, these resources, including renewable resources inside and outside New Jersey, would not receive any subsidies to recover the decrease in prices compared to the competitive capacity market.

Under those conditions, it is likely that there would not be enough capacity offers from other generators and that therefore JCPL would have to enter into bilateral purchase contracts. PSEG acknowledges this outcome and recommends that the FRR entity should have the power to buy the necessary capacity bilaterally and recover the additional costs through a statewide nonbypassable charge under the societal benefits clause.¹⁰

Sealed Bid Marginal Pricing

PSEG's second option, Sealed Bid Marginal Pricing, would procure capacity resources to meet JCPL's FRR Obligation through a two block auction. In the first block, all non coal resources in the EMAAC LDA would be eligible to offer their capacity. In the second block, all non coal resources in the MAAC LDA would be eligible to offer their capacity. The clearing price in each procurement block would be set by the offer price of the marginal capacity resource cleared to meet the requirement.¹¹ There would be two market clearing auction prices, one for each block.

The sealed bid marginal pricing option does not meet the objective of requiring the purchase of specific nuclear or renewable resources. The sealed bid marginal pricing

¹⁰ See PSEG at 10 & n.17.

¹¹ The PSEG proposal does not describe how the procurement quantity for each block would be set prior to the auction. In the PJM Capacity Market, procurements in each LDA are determined internally within the auction optimization based on the capacity offers subject to the Capacity Emergency Transfer Limit (CETL) between LDAs.

approach excludes only coal resources. It is not clear how the sealed bid marginal pricing approach meets FRR goals related to procurement of specific resources.

Impacts of FRR 2.0

In order to understand the range of implications of FRR 2.0, the Independent Market Monitor (IMM) analyzed two sets of scenarios. The Scenario 6 options are based on the RPM Derivative Pricing approach and the Scenario 7 options are based on the Sealed Bid Marginal Pricing approach.¹² These scenarios are in addition to the scenarios analyzed in the Market Monitor Report filed on May 13, 2020, and Market Monitor Reply Comments to PSEG and Exelon filed on July 15, 2020.

Impacts of FRR on PJM Capacity Market Prices

Table 2 shows the impact on PJM capacity market prices of FRR 2.0. Table 2 compares the clearing prices for the rest of the PJM Capacity Market by LDA for the 2021/2022 RPM BRA and for Scenario 6 and Scenario 7.¹³ All binding constraints would have remained binding and, in addition, the DEOK LDA constraint would be binding. The Rest of RTO LDA clearing price would decrease by \$22.33 per MW-day from \$140.00 per MW-day to \$117.67 per MW-day, or 16.0 percent, from the Rest of the RTO clearing price in the 2021/2022 RPM BRA. The clearing price of the EMAAC LDA would decrease by \$24.06 per MW-day from \$165.73 per MW-day to \$141.67 per MW-day, or 14.5 percent, from the EMAAC clearing price in the 2021/2022 RPM BRA. The clearing price of the MAAC LDA would decrease by \$22.33 per MW-day from \$140.00 per MW-day to \$117.67 per MW-day, or 16.0 percent, from the MAAC clearing price in the 2021/2022 RPM BRA. The clearing price of the PSEG LDA would increase by \$2.79 per MW-day from \$204.29 per MW-day to \$207.08 per MW-day, or 1.4 percent from the PSEG clearing price in the 2021/2022 RPM BRA. The clearing price of the DEOK LDA would decrease by \$11.53 per MW-day from \$140.00 per MW-day to \$128.47 per MW-day, or 8.2 percent, from the DEOK clearing price in the 2021/2022 RPM BRA. The clearing prices of all other constrained LDAs would remain the same.

¹² Scenario 6A continues the numbering used for prior JCPL scenarios analyzed by the IMM. The Scenarios 1A and Scenario 2A (Scenario 5 and Scenario 6) are analyzed in the IMM report. The Scenario 3A, Scenario 4A and Scenario 5A are analyzed in IMM Reply comments to PSEG and Exelon (July 15, 2020).

¹³ The prices in this table vary slightly from those in the NJ FRR Report as a result of the change in procurement of external resources under the FRR rules compared to purchasing the least cost resources.

Table 2 Clearing Prices (\$ per MW-day) in Scenario 6 and Scenario 7 compared to the actual BRA results

LDA	Scenario 6 and		Change	Percent
	2021/2022 BRA	Scenario 7		
Rest of RTO	\$140.00	\$117.67	(\$22.33)	(16.0%)
Rest of MAAC	\$140.00	\$117.67	(\$22.33)	(16.0%)
Rest of EMAAC	\$165.73	\$141.67	(\$24.06)	(14.5%)
Rest of SWMAAC	\$140.00	\$117.67	(\$22.33)	(16.0%)
Rest of PSEG	\$204.29	\$207.08	\$2.79	1.4%
PSEG North	\$204.29	\$207.08	\$2.79	1.4%
DPL South	\$165.73	\$141.67	(\$24.06)	(14.5%)
Pepco	\$140.00	\$117.67	(\$22.33)	(16.0%)
Rest of ATSI	\$171.33	\$171.33	\$0.00	0.0%
ATSI Cleveland	\$171.33	\$171.33	\$0.00	0.0%
ComEd	\$195.55	\$195.55	\$0.00	0.0%
BGE	\$200.30	\$200.30	\$0.00	0.0%
PPL	\$140.00	\$117.67	(\$22.33)	(16.0%)
DAY	\$140.00	\$117.67	(\$22.33)	(16.0%)
DEOK	\$140.00	\$128.47	(\$11.53)	(8.2%)

Scenario 6 (RPM Derivative Pricing)

In Scenario 6, an FRR is established for the JCPL LDA (JCPL FRR), and the JCPL FRR procures all the nuclear and renewable resources in New Jersey and outside New Jersey in EMAAC and MAAC LDAs according to the proposed RPM Derivative Pricing approach.¹⁴ In Scenario 6, it is assumed that all nuclear and renewable energy resources, including state subsidized resources in New Jersey, would offer at the cap set for the Tier I procurement or 100 percent of the clearing price in the residual RPM BRA for the LDA in which the resource is located.¹⁵ In Scenario 6, it is assumed that all nuclear and renewable energy resources, located outside New Jersey in the EMAAC and MAAC LDAs would offer at the cap set for the Tier II procurement or 105 percent of the clearing price in the residual RPM BRA for the LDA in which the resource is located.

Each of the options is analyzed with and without price suppression in the PJM Capacity Market. The price suppression cases use the prices calculated for the remaining PJM

¹⁴ New Jersey nuclear plants would qualify for tier 1 and non New Jersey nuclear plants would qualify for tier 2. Tier 1 also includes DR and EE resources.

¹⁵ For Scenario 6, the residual RPM BRA is a rerun of the 2021/2022 RPM BRA excluding the JCPL load obligation and the JCPL FRR resources.

capacity market as a result of the NJ FRR entity as the basis for the FRR offers. The non price suppression cases use the BRA clearing prices for the rest of the PJM capacity market as the basis for the FRR offers. Regardless of the likelihood of either outcome, the difference between the price suppression and the non price suppression cases is a good measure of the benefits to New Jersey from the price suppression in the PJM capacity market that results from the creation of an FRR, regardless of the specific FRR details.

In Scenario 6, the state supported resources would continue to receive subsidies in addition to the capacity payments from the FRR procurement. All nuclear resources in New Jersey would continue to receive ZEC subsidy payments to cover the difference between the capacity payment from the JCPL FRR procurement and the capacity market equivalent of the total ZEC subsidy (\$413.83 per MW-day).¹⁶ The analysis assumes that the total payments to the nuclear plants would remain equal to the current sum of capacity market prices and ZECs payments. The renewable resources would continue to receive subsidies through the renewable energy credit program.^{17 18} The analysis does not assume that the total payments to renewables would remain equal to the current sum of capacity market prices and RECs payments.

Four Scenario 6 options are analyzed. Scenario 6A (Table 3 and Table 5) assumes that the FRR suppressed prices in the remaining PJM capacity market, and Scenario 6B (Table 4 and Table 6) assumes that the FRR did not suppress prices in the remaining capacity market. The net load charges define what customers pay when all factors are included. The net load charges metric is used to compare the results of the scenarios and options.

Table 3 shows the gross and net load charges for the JCPL LDA for the 2021/2022 BRA in Scenario 6A, assuming price suppression in the remaining PJM capacity market. The net load charges for the JCPL LDA would effectively not change (0.0 percent) compared to the results of the 2021/2022 RPM BRA. Under Scenario 6A, the gross load charges for the JCPL LDA would decrease by \$36.5 million or 9.2 percent compared to the results of the

¹⁶ The capacity market price equivalent to the ZEC subsidy is derived from the \$300 million per year or \$248.10 per MW-day approved by the State of New Jersey for the three nuclear plants in New Jersey plus the capacity market clearing price in the 2021/2022 RPM BRA (\$165.73 per MW-day). The ZEC subsidy assumed the nuclear plants would continue to receive energy and capacity market revenues from the PJM Energy and Capacity Markets.

¹⁷ REC payments were estimated using the alternative compliance payments for the 2021/2022 Delivery Year, \$50 per credit for class 1 and class 2 resources and \$238 per credit for solar resources. See New Jersey Administrative Code §14:8-2.10.

¹⁸ Alternative compliance payments serve as a cap on REC prices and the market price for RECs is generally lower than the alternative compliance payment level. The 2020 average price of a New Jersey class 1 REC is \$8.93 per credit. The 2020 average price for a New Jersey class 2 REC is \$4.58 per credit. The 2020 average price for a New Jersey SREC is \$183.47 per credit.

2021/2022 RPM BRA. The net load charges when the JCPL is included in the PJM Capacity Market are net of the Capacity Transfer Rights (CTRs) payments. CTRs do not exist under an FRR. Under an FRR, the actual price paid for the imports is included, which is the economic equivalent of CTRs. The subsidies for the nuclear resources would increase by \$29.1 million or 9.6 percent. After accounting for gross load charges, CTRs and subsidies, the net load charges for the JCPL LDA would increase by \$0.3 million, 0.0 percent, compared to the results of the 2021/2022 RPM BRA.¹⁹

Table 3 Net load charges for JCPL FRR (Scenario 6A) assuming price suppression in the remaining PJM capacity market (RPM Derivative Pricing)

JCPL FRR	BRA	Scenario 6A	Change	Percent
Zonal UCAP Obligation	6,538.6	6,583.7	45.1	0.7%
Zonal Capacity Price (\$/MW-day)	\$166.31	\$149.99	(\$16.33)	(9.8%)
Gross Load Charges	\$396,922,134	\$360,423,693	(\$36,498,441)	(9.2%)
Value of CTRs	\$7,710,573	\$0	(\$7,710,573)	(100.0%)
Subsidies	\$304,669,369	\$333,765,560	\$29,096,191	9.6%
Net Load Charges	\$693,880,930	\$694,189,253	\$308,323	0.0%

Table 4 shows the gross and net load charges for the JCPL LDA for the 2021/2022 RPM BRA in Scenario 6B, assuming no price suppression in the remaining PJM capacity market. After accounting for gross load charges, CTRs and subsidies, the net load charges for the JCPL LDA would increase by \$21.0 million or 3.0 percent compared to the results of the 2021/2022 RPM BRA.

Table 4 Net load charges for JCPL FRR (Scenario 6B) assuming no price suppression in the remaining PJM capacity market (RPM Derivative Pricing)

JCPL FRR	BRA	Scenario 6B	Change	Percent
Zonal UCAP Obligation	6,538.6	6,583.7	45.1	0.7%
Zonal Capacity Price (\$/MW-day)	\$166.31	\$169.45	\$3.13	1.9%
Gross Load Charges	\$396,922,134	\$407,186,370	\$10,264,236	2.6%
Value of CTRs	\$7,710,573	\$0	(\$7,710,573)	(100.0%)
Subsidies	\$304,669,369	\$307,730,668	\$3,061,299	1.0%
Net Load Charges	\$693,880,930	\$714,917,037	\$21,036,108	3.0%

The difference in the net load charges to the JCPL LDA between Scenario 6A and Scenario 6B, \$20.7 million, is a direct measure of the benefits of the price suppressive

¹⁹ CTRs are the equivalent of FTRs in the energy market. This analysis explicitly accounts for the actual payments to imported resources under the FRR options, so there is no corresponding benefit possible in the FRR scenarios.

impact of an FRR on the remaining PJM capacity market to JCPL customers. Under Scenario 6A, the net load charges for the JCPL LDA for the 2021/2022 RPM BRA, if JCPL FRR resources were paid based on the suppressed clearing prices in the remaining PJM capacity market, would be \$694.2 million (Table 3). Under Scenario 6B, the net load charges for the JCPL LDA for the 2021/2022 RPM BRA, if JCPL FRR resources were paid based on the higher clearing prices in the remaining PJM capacity market without price suppression, would be \$714.9 million (Table 4).

Table 5 shows the gross and net load charges for all of New Jersey for the 2021/2022 BRA and Scenario 6A, assuming price suppression in the remaining PJM capacity market. Under Scenario 6A, the net load charges for New Jersey would decrease by \$73.3 million or 4.5 percent compared to the results of the 2021/2022 RPM BRA. The lower load charges in Scenario 6A are the result of price suppression, which affects both the JCPL FRR prices paid and the prices paid in the other New Jersey LDAs, and an increase in the value of CTRs, partly offset by higher subsidies for nuclear resources.

Table 5 Net load charges for New Jersey (Scenario 6A) assuming price suppression in the remaining PJM capacity market (RPM Derivative Pricing)

New Jersey	BRA	Scenario 6A	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$1,349,929,731	(\$52,243,734)	(3.7%)
Value of CTRs	\$94,492,963	\$144,608,496	\$50,115,533	53.0%
Subsidies	\$304,669,369	\$333,765,560	\$29,096,191	9.6%
Net Load Charges	\$1,612,349,871	\$1,539,086,795	(\$73,263,076)	(4.5%)

Table 6 shows the gross and net load charges for all of New Jersey for the 2021/2022 BRA and Scenario 6B, assuming no price suppression in the remaining PJM capacity market. Under Scenario 6B, the net load charges for New Jersey would increase by \$21.7 million or 1.3 percent compared to the results of the 2021/2022 RPM BRA.

Table 6 Net load charges for New Jersey (Scenario 6B) assuming no price suppression in the remaining PJM capacity market (RPM Derivative Pricing)

New Jersey	BRA	Scenario 6B	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$1,413,137,439	\$10,963,974	0.8%
Value of CTRs	\$94,492,963	\$86,842,798	(\$7,650,165)	(8.1%)
Subsidies	\$304,669,369	\$307,730,668	\$3,061,299	1.0%
Net Load Charges	\$1,612,349,871	\$1,634,025,308	\$21,675,437	1.3%

The difference in the net load charges to New Jersey between Scenario 6A and Scenario 6B, \$94.9 million, is a direct measure of the benefits of the price suppressive impact of an FRR on the remaining PJM capacity market, to New Jersey customers. Under Scenario 6A, the net load charges for New Jersey for the 2021/2022 RPM BRA, if JCPL FRR resources were paid based on the suppressed clearing prices in the remaining PJM

capacity market and the other New Jersey LDAs paid the suppressed price, would be \$1,539.1 million (Table 5). Under Scenario 6B, the net load charges for the New Jersey for the 2021/2022 RPM BRA, if JCPL FRR resources were paid based on the higher clearing prices in the remaining PJM capacity market without price suppression, and the other New Jersey LDAs paid the higher clearing prices, would be \$1,634 million (Table 6). The difference, \$94.9 million is a result of the lower clearing prices in the remaining PJM capacity market due to the creation of the JCPL FRR.

Two additional Scenario 6 options were analyzed (Scenario 6C and Scenario 6D) in which all resources procured for meeting the JCPL FRR Obligation are compensated at the same rate as the New Jersey state supported nuclear resources (\$413.83 per MW-day). Scenario 6C (Table 7 and Table 8) assumes price suppression in the remaining PJM capacity market and Scenario 6D (Table 7 and Table 9) does not assume price suppression in the remaining PJM capacity market.

The additional options are evaluated in order to show the impact of an FRR design that pays all resources a single market clearing price equal to the total price paid to the New Jersey nuclear plants.

Table 7 shows the gross and net load charges for the JCPL LDA for the 2021/2022 BRA under Scenario 6C and Scenario 6D. Under Scenario 6C and Scenario 6D, the gross load charges for the JCPL LDA would increase by \$597.5 million or 150.5 percent compared to the results of the 2021/2022 RPM BRA. The subsidies for the New Jersey nuclear plants would decrease, resulting in a decrease of total subsidies by \$300.0 million, or 98.5 percent, because the target revenues for the nuclear resources would be met by the higher price, and ZECs subsidies would decrease. After accounting for CTRs and subsidies, the net load charges for the JCPL LDA would increase by \$305.2 million or 44.0 percent compared to the results of the 2021/2022 RPM BRA.²⁰

Table 8 shows the gross and net load charges for all of New Jersey for the 2021/2022 BRA in Scenario 6C, assuming price suppression in the remaining PJM capacity market. Under Scenario 6C, the net load charges for New Jersey would increase by \$231.6 million or 14.4 percent compared to the results of the 2021/2022 RPM BRA. The higher load charges in Scenario 6C compared to the results of the 2021/2022 RPM BRA are the result of higher prices in the JCPL FRR, partly offset by the lower prices in the AECO and RECO Zones, which would remain in the PJM Capacity Market, lower subsidies and

²⁰ There is only one table showing this result for 6C and 6D because the prices paid to FRR resources are not a function of capacity market prices and therefore price suppression in the capacity market does not affect the results for the JCPL LDA. Price suppression does affect the results for New Jersey as a whole because the other LDAs remain in the PJM capacity market.

increased value of CTRs. The lower prices in AECO and RECO are the result of the price suppressive effects on the remaining capacity market.

Table 9 shows the gross and net load charges for all of New Jersey for the 2021/2022 RPM BRA in Scenario 6D, assuming no price suppression in the remaining PJM capacity market. Under Scenario 6D, the net load charges for New Jersey would increase by \$305.9 million or 19.0 percent compared to the results of the 2021/2022 RPM BRA.

The difference in the net load charges to New Jersey between Scenario 6C and Scenario 6D, \$74.2 million, is a direct measure of the benefits of the price suppressive impact of an FRR on the remaining PJM capacity market, to New Jersey customers. Under Scenario 6C, the net load charges for New Jersey for the 2021/2022 RPM BRA if the other New Jersey LDAs paid the suppressed price, would be \$1,844 million (Table 8). Under Scenario 6D, the net load charges for New Jersey for the 2021/2022 RPM BRA if the other New Jersey LDAs paid the higher clearing prices in the remaining PJM capacity market without price suppression, would be \$1,918.2 million (Table 9).

Table 7 Net load charges for JCPL FRR (Scenario 6C and Scenario 6D) (RPM Derivative Pricing)

JCPL FRR	BRA	Scenario 6C and Scenario 6D	Change	Percent
Zonal UCAP Obligation	6,538.6	6,583.7	45.1	0.7%
Zonal Capacity Price (\$/MW-day)	\$166.31	\$413.83	\$247.52	148.8%
Gross Load Charges	\$396,922,134	\$994,454,388	\$597,532,255	150.5%
Value of CTRs	\$7,710,573	\$0	(\$7,710,573)	(100.0%)
Subsidies	\$304,669,369	\$4,637,573	(\$300,031,796)	(98.5%)
Net Load Charges	\$693,880,930	\$999,091,962	\$305,211,032	44.0%

Table 8 Net load charges for New Jersey (Scenario 6C) assuming price suppression in the remaining PJM Capacity Market (RPM Derivative Pricing)

New Jersey	BRA	Scenario 6C	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$1,983,960,426	\$581,786,961	41.5%
Value of CTRs	\$94,492,963	\$144,608,496	\$50,115,533	53.0%
Subsidies	\$304,669,369	\$4,637,573	(\$300,031,796)	(98.5%)
Net Load Charges	\$1,612,349,871	\$1,843,989,504	\$231,639,633	14.4%

Table 9 Net load charges for New Jersey (Scenario 6D) assuming no price suppression in the remaining PJM Capacity Market (RPM Derivative Pricing)

New Jersey	BRA	Scenario 6D	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$2,000,405,457	\$598,231,992	42.7%
Value of CTRs	\$94,492,963	\$86,842,798	(\$7,650,165)	(8.1%)
Subsidies	\$304,669,369	\$4,637,573	(\$300,031,796)	(98.5%)
Net Load Charges	\$1,612,349,871	\$1,918,200,233	\$305,850,362	19.0%

Scenario 7 (Sealed Bid Marginal Pricing)

In Scenario 7, the IMM assumes that an FRR is established for the JCPL LDA (JCPL FRR) and the JCPL FRR procures all the nuclear and renewable resources in New Jersey and outside New Jersey in EMAAC and MAAC LDAs according to the proposed Sealed Bid Marginal Pricing approach. But there is no requirement in the proposed design that nuclear and renewable resources be given preference.

In Scenario 7, it is assumed that the procurement price for each block would be set by the marginal resource offered at a rate equal to the 2021/2022 net CONE times B offer cap applicable for the block (\$243.8 per MW-day for EMAAC and \$221.16 per MW-day for MAAC).²¹

In Scenario 7, the state supported resources would also continue to receive subsidies in addition to the capacity payments from the JCPL FRR procurement. All nuclear resources in New Jersey would continue to receive ZEC subsidy payments to cover the difference between the capacity payment from the JCPL FRR procurement and the capacity market equivalent of the total ZEC subsidy (\$413.83 per MW-day). The analysis assumes that the total payments to the New Jersey nuclear plants would remain equal to the current sum of capacity market prices and ZECs payments. The renewable resources would continue to receive subsidies through the renewable energy credit program.^{22 23} The analysis does not assume that the total payments to renewables would remain equal to the current sum of capacity market prices and RECs payments.

²¹ The net CONE times B offer cap for an LDA is derived as the maximum net CONE times B offer cap applicable for the zones within the LDA.

²² REC payments were estimated using the alternative compliance payments for the 2021/2022 delivery year, \$50 per credit for class 1 and class 2 resources and \$238 per credit for solar resources. See N. J. A. C. §14:8-2.10.

²³ Alternative compliance payments serve as a cap on REC prices and the market price for RECs is generally lower than the alternative compliance payment level. The 2020 average price of a New Jersey class 1 REC is \$8.93 per credit. The 2020 average price for a New Jersey class 2 REC is \$4.58 per credit. The 2020 average price for a New Jersey SREC is \$183.47 per credit.

There are two Scenario 7 options analyzed. Scenario 7A (Table 10 and Table 11) assumes that the FRR suppressed prices in the remaining PJM capacity market and Scenario 7B (Table 10 and Table 12) assumes that the FRR did not suppress prices in the remaining PJM capacity market.

Table 10 shows the gross and net load charges for the JCPL LDA for the 2021/2022 BRA under Scenario 7A and Scenario 7B. Under Scenario 7A and Scenario 7B, the gross load charges for the JCPL LDA would increase by \$188.5 million or 47.5 percent compared to the results of the 2021/2022 RPM BRA. The subsidies for the New Jersey nuclear plants would decrease, resulting in a decrease of total subsidies by \$94.4 million, or 31.0 percent, because the target revenues for the nuclear resources would be met by the higher price, and ZECs subsidies would decrease. After accounting for CTRs and subsidies, the net load charges for the JCPL LDA would increase by \$101.8 million or 14.7 percent compared to the results of the 2021/2022 RPM BRA.²⁴

Table 11 shows the gross and net load charges for all of New Jersey for the 2021/2022 BRA in Scenario 7A, assuming price suppression in the remaining PJM capacity market. Under Scenario 7A, the net load charges for New Jersey would increase by \$28.2 million or 1.8 percent compared to the results of the 2021/2022 RPM BRA. The higher load charges in Scenario 7A for New Jersey compared to the results of the 2021/2022 BRA are the result of higher prices in the JCPL FRR, partly offset by the lower prices in the AECO and RECO Zones, which would remain in the PJM Capacity Market, lower subsidies and increased value of CTRs. The lower prices in AECO and RECO are the result of the price suppressive effects on the remaining capacity market.

Table 12 shows the gross and net load charges for all of New Jersey for the 2021/2022 RPM BRA and Scenario 7B assuming no price suppression in the remaining PJM Capacity Market. Under Scenario 7B, the net load charges for New Jersey would increase by \$102.5 million, or 6.4 percent, compared to the results of the 2021/2022 RPM BRA.

The difference in the net load charges to New Jersey between Scenario 7A and Scenario 7B, \$74.2 million, is a direct measure of the benefits of the price suppressive impact of an FRR on the remaining capacity market, to New Jersey customers. Under Scenario 7A, the net load charges for New Jersey for the 2021/2022 RPM BRA if the other New Jersey LDAs paid the suppressed price, would be \$1,640.6 million (Table 11). Under Scenario 7B, the net load charges for New Jersey for the 2021/2022 RPM BRA if the other New

²⁴ There is only one table showing this result for 7A and 7B because the prices paid to FRR resources is not a function of capacity market prices and therefore price suppression in the capacity market does not affect the results for the JCPL LDA. Price suppression does affect the results for New Jersey as a whole because the other LDAs remain in the PJM capacity market.

Jersey LDAs paid the higher clearing prices in the remaining PJM capacity market without price suppression, would be \$1,714.8 million (Table 12).

Table 10 Net load charges for JCPL FRR (Scenario 7A and Scenario 7B) (Sealed Bid Marginal Pricing)

JCPL FRR	Scenario 7A and		Change	Percent
	BRA	Scenario 7B		
Zonal UCAP Obligation	6,538.6	6,583.7	45.1	0.7%
Zonal Capacity Price (\$/MW-day)	\$166.31	\$243.62	\$77.31	46.5%
Gross Load Charges	\$396,922,134	\$585,438,767	\$188,516,633	47.5%
Value of CTRs	\$7,710,573	\$0	(\$7,710,573)	(100.0%)
Subsidies	\$304,669,369	\$210,257,913	(\$94,411,456)	(31.0%)
Net Load Charges	\$693,880,930	\$795,696,680	\$101,815,750	14.7%

Table 11 Net load charges for New Jersey (Scenario 7A) assuming price suppression in the remaining PJM capacity market (Sealed Bid Marginal Pricing)

New Jersey	BRA	Scenario 7A	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$1,574,944,805	\$172,771,340	12.3%
Value of CTRs	\$94,492,963	\$144,608,496	\$50,115,533	53.0%
Subsidies	\$304,669,369	\$210,257,913	(\$94,411,456)	(31.0%)
Net Load Charges	\$1,612,349,871	\$1,640,594,222	\$28,244,351	1.8%

Table 12 Net load charges for New Jersey (Scenario 7B) assuming no price suppression in the remaining PJM capacity market (Sealed Bid Marginal Pricing)

New Jersey	BRA	Scenario 7B	Change	Percent
Zonal UCAP Obligation	20,568.1	20,623.0	54.9	0.3%
Gross Load Charges	\$1,402,173,465	\$1,591,389,836	\$189,216,371	13.5%
Value of CTRs	\$94,492,963	\$86,842,798	(\$7,650,165)	(8.1%)
Subsidies	\$304,669,369	\$210,257,913	(\$94,411,456)	(31.0%)
Net Load Charges	\$1,612,349,871	\$1,714,804,951	\$102,455,080	6.4%

Market Power in FRR 2.0

Market Power under the RPM Derivative Pricing Option

PSEG proposed two procurement methods that it asserts would mitigate market power concerns raised by the IMM.

Under RPM Derivative Pricing, the offer prices would be capped at a specified percent of the future clearing prices for the remaining PJM capacity market. PSEG argues that because the prices would be explicitly tied to the remaining PJM capacity market, which

is subject to the PJM's market power mitigation rules and the oversight of the IMM, the procurement method would ensure that market power is not exercised.²⁵

FRR 2.0 does not resolve the market power concerns associated with the defined FRR options. In the RPM Derivative Pricing option, PSEG relies on limiting FRR offers to offers that are contingent on clearing prices in the later PJM capacity auction. Given that one likely effect of any FRR option is to suppress prices in the remaining PJM capacity market, the FRR 2.0 seems clever on its face. Not only does it rely on the market power mitigation rules of the PJM capacity market, it operates as a mechanism to implement buyer side market power on behalf of New Jersey by suppressing prices in the PJM capacity market. The price suppression directly reduces RPM Derivative prices and also reduces prices in the other New Jersey LDAs. But there is no guarantee that sellers will agree to take on the risk associated with such contingent offers. If there are not enough offers, FRR 2.0 indicates that there will be bilateral contracts. There is no protection against market power in such bilateral negotiations. Under the FRR design, the PSEG/Exelon New Jersey nuclear plants are exempt from the price suppressive effects of the link to the capacity auction because they will continue to receive ZECs payments to make up the difference. The New Jersey offshore wind plants (PSEG has an ownership position) are also exempt from the price suppressive effects of the link to the capacity auction because their total revenue is guaranteed. But New Jersey renewable resources are not exempt from the price suppressive effects of the link to the capacity auction because their total revenue is not guaranteed.

In addition, FRR Version 2.0 focuses on mitigating market power from other capacity market sellers, but ignores PSEG's role. PSEG and Exelon would be jointly pivotal suppliers in the JCPL FRR Tier 1 procurement. Of the 4,670 MW UCAP of nuclear and renewable energy resources in New Jersey, nearly 3,300 MW UCAP are owned by PSEG and Exelon.

Under the RPM Derivative Pricing approach, PSEG and Exelon's resources in Pennsylvania would qualify for Tier 2 procurement. Table 12 shows the list of nuclear resources in the EMAAC and MAAC LDAs.

²⁵ See PSEG at 11.

Table 13 Location and ICAP of Nuclear Resources in EMAAC and MAAC LDAs

LDA	Zone	State	Name	Parent Company	ICAP (MW)
EMAAC	PSEG	NJ	HOPE CREEK 1	Public Service Enterprise Group Incorporated	1,172.0
EMAAC	PSEG	NJ	SALEM 1	Exelon Corporation	491.1
EMAAC	PSEG	NJ	SALEM 1	Public Service Enterprise Group Incorporated	661.9
EMAAC	PSEG	NJ	SALEM 2	Exelon Corporation	488.8
EMAAC	PSEG	NJ	SALEM 2	Public Service Enterprise Group Incorporated	658.8
EMAAC	PECO	PA	LIMERICK 1	Exelon Corporation	1,119.7
EMAAC	PECO	PA	LIMERICK 2	Exelon Corporation	1,122.1
EMAAC	PECO	PA	PEACH BOTTOM 2	Exelon Corporation	611.8
EMAAC	PECO	PA	PEACH BOTTOM 2	Public Service Enterprise Group Incorporated	611.9
EMAAC	PECO	PA	PEACH BOTTOM 3	Exelon Corporation	613.4
EMAAC	PECO	PA	PEACH BOTTOM 3	Public Service Enterprise Group Incorporated	613.3
MAAC	METED	PA	TMI 1	Exelon Corporation	802.8
MAAC	PPL	PA	SUSQUEHANNA 2	Allegheny Electric Cooperative, Inc.	124.7
MAAC	PPL	PA	SUSQUEHANNA 2	Talen Energy Corporation	1,122.3
SWMAAC	BGE	MD	CALVERT CLIFFS 1	Exelon Corporation	866.0
SWMAAC	BGE	MD	CALVERT CLIFFS 2	Exelon Corporation	841.8

Market Power under the Sealed Bid Marginal Pricing Option

Market power concerns also remain under the Sealed Bid Marginal Pricing option. It is not clear how this option meets the stated goals of the FRR approach, given that carbon emitting resources can compete and clear under this option. PSEG misdefines the relevant markets and therefore incorrectly characterizes the potential supply under this option as competitive. If New Jersey limits competitors under this option to nuclear and renewable resources, the market power issue is more significant.

PSSEG’s HHI analysis is solely about the Sealed Bid Marginal Pricing option. PSEG argues that the HHI metrics show that the market is not concentrated in EMAAC and MAAC among the non coal capacity sellers that they believe would participate in the Sealed Bid Marginal Pricing auction.²⁶ The goal of the JCPL FRR procurement, as described by the PSEG and Exelon, is to procure nuclear and renewable energy resources in New Jersey, particularly the ones receiving state subsidies, first and any additional resources as needed to meet the balance of the JCPL FRR Obligation. PSEG does not describe how this objective would be enforced in the Sealed Bid Marginal Pricing auction.

PSEG’s HHI calculation is based on the incorrect premise that all capacity resources in EMAAC and MAAC would be considered equally in the JCPL FRR procurement despite the stated goal of the procurement. If the objective of the Sealed Bid Marginal Pricing

²⁶ See PSEG, Morris Affidavit.

Auction is to procure nuclear and renewable energy resources, PSEG and Exelon are jointly pivotal suppliers. PSEG's assertion that the state supported resources would simply not exercise their market power and instead would offer as price takers is not supported.²⁷ Given the objective of the procurement, state supported resources would have an incentive and opportunity to exercise their market power.

The IMM calculated HHI values consistent with New Jersey's procurement goals. The HHI for nuclear and renewable energy resources outside New Jersey in EMAAC and MAAC LDAs (Tier 2) is 3229.²⁸ The HHI for nuclear and renewable energy resources in New Jersey and nuclear and renewable energy resources outside New Jersey in EMAAC and MAAC LDAs (Tier1 and Tier 2) is 2096. The IMM's calculated HHI assumes that all nuclear and renewable energy resources in New Jersey, EMAAC and MAAC LDAs are deliverable to the JCPL Zone. The HHI would be higher if the Capacity Emergency Transfer Limits were accounted for. The HHI values do not support PSEG's assertion that the market is not concentrated.

²⁷ See PSEG at 13.

²⁸ The IMM's HHI calculation is based on UCAP MW of non seasonal generation, demand and EE resources that were offered in the 2021/2022 RPM BRA. HHI calculations presented in the Morris affidavit did not include demand and EE resources. See PSEG, Morris Affidavit.