

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

Fern Solar LLC)	
)	Docket Nos. ER20-2186-003,
)	EL20-62-001
)	

ON BEHALF OF THE
INDEPENDENT MARKET MONITOR FOR PJM

**SUMMARY OF REBUTTAL TESTIMONY OF
JOSEPH E. BOWRING ON BEHALF OF
THE INDEPENDENT MARKET MONITOR FOR PJM**

1 The purpose of my rebuttal testimony in this case is to respond to questions raised
2 by the Presiding Judge and by witnesses for the applicant, Fern Solar, based on my initial
3 direct and answering testimony, which identified flaws in the reactive capability rate
4 proposed by the applicant. The statement that cost-based compensation exceeding
5 \$2,199/MW-year is overrecovery in the PJM markets is not based on a conclusion about
6 whether \$2,199/MW-year is the prudently incurred cost of service, or based on cost of
7 service at all. There is no reason for cost-based compensation in a market environment
8 like PJM. I do not agree that \$2,199/MW-year is a cost-based rate. I refer to the
9 \$2,199/MW-year as nonmarket revenue. Any compensation exceeding \$2,199/MW-year
10 is overrecovery in the PJM markets solely because that is the amount assumed to be paid
11 for reactive power in the development of the demand curve (VRR curve) in the PJM
12 Capacity Market.

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**REBUTTAL TESTIMONY OF JOSEPH E. BOWRING
ON BEHALF OF THE INDEPENDENT MARKET MONITOR FOR PJM**

1 Q 1. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

2 A. The purpose of my rebuttal testimony is to respond to the Presiding Judge's request
3 for clarification of my testimony and to respond to testimony of applicant witnesses.

4 In the prehearing conference convened July 18, 2022, the Presiding Judge asked (Tr.
5 at 194:12–195:6):

6 What's on my mind is the concept of revenue crediting.
7 We all know—let's just take a typical state proceeding
8 where the utility has surplus capacity right, and the full
9 capacity is in rates at the retail level.

10 And they're selling stuff from that capacity, that surplus,
11 and making revenues in the market, and the traditional
12 regulatory solution is to credit those revenues against
13 the revenue requirement because the customers are
14 bearing at retail the entire cost. And I'm wondering if
15 I'm supposed to interpret Mr. Bowring's testimony.

16 I'm not saying whether he's saying that. I'm wondering
17 if he's asking me to interpret the situation as being that
18 when the generating company is using the same asset
19 that is a rate base or reactive power purposes at FERC

1 under cross based compensation, and is using that same
2 asset to make money in the wholesale market.

3 Whether I should be crediting some portion of those
4 revenues against the revenue requirement that reflects
5 cross base compensation?

6 In the order issued in this proceeding August 10, 2022 (180 FERC ¶ 63,024),
7 Appendix of Questions for Witnesses, the Presiding Judge addressed two questions
8 to the Market Monitor:

9 1-3: The IMM has said that any cost-based
10 compensation exceeding \$2,199/MW-year is over-
11 recovery. Is it over-recovery because \$2,199 represents
12 the prudently incurred cost of service, such that any
13 higher cost is necessarily an unreasonable cost? Or is it
14 over-recovery because the IMM views any cost-based
15 reactive compensation exceeding \$2,199 as necessarily
16 attributable to revenues received from the capacity
17 market? Explain in detail.

18 1-4: If the IMM is saying that any cost-based reactive
19 compensation exceeding \$2,199 is necessarily
20 attributable to revenues received from the capacity
21 market, suppose then that the reasonable cost-based
22 reactive compensation is, say, \$1,999. Why, in that
23 situation, would the IMM assume that no part of that
24 compensation duplicates revenues received from the
25 capacity market? More generally, why would the
26 revenues one attributes to the capacity market vary
27 depending on the cost-of-service amount actually
28 incurred?

29 **Q 2. WHAT IS YOUR RESPONSE TO THE PRESIDING JUDGE'S FIRST**
30 **QUESTION?**

31 A. The statement that cost-based compensation exceeding \$2,199/MW-year is
32 overrecovery in the PJM markets is not based on a conclusion about whether

1 \$2,199/MW-year is the prudently incurred cost of service, or based on cost of
2 service at all.

3 There is no supportable cost-based compensation for reactive power in the
4 competitive PJM markets. There is no reason for cost-based compensation in a
5 market environment like PJM. I do not agree that \$2,199/MW-year is a cost-based
6 rate. I refer to the \$2,199/MW-year as nonmarket revenue.

7 Any compensation exceeding \$2,199/MW-year is overrecovery in the PJM markets
8 solely because that is the amount assumed to be paid for reactive power in
9 development of the demand curve (VRR curve) in the PJM Capacity Market.

10 For the same reason, if the level of reactive revenue incorporated in the VRR curve
11 were changed to \$1,199/MW-year, my position would be that any compensation
12 exceeding \$1,199/MW-year would be overrecovery in the PJM markets.

13 The \$2,199/MW-year value is in the PJM Tariff.¹ The \$2,199/MW-year value was
14 based, at the time it was added to the PJM Tariff, on a calculation by the IMM of a
15 five year historical average of reactive rates in PJM. The \$2,199/MW-year is not
16 based on an analysis of costs. It is based on the actual revenues paid to an identified
17 set of actual PJM resources, based on settlements. The \$2,199/MW-year actually
18 exceeds the current average payment for reactive in PJM.

19 The PJM market rules that account for recovery of reactive revenues are built into
20 the auction parameters, specifically, the VRR curve. The PJM market rules
21 explicitly account for recovery of reactive revenues of \$2,199 per MW-year through
22 inclusion in the Net CONE parameter of the capacity market demand (VRR) curve.
23 The Net CONE parameter is the net cost of new entry which equals the gross cost of
24 new entry minus net revenues from the energy and ancillary services markets,
25 including reactive revenue. The Net CONE parameter directly affects clearing prices
26 by affecting both the maximum capacity price and the location of the downward
27 sloping part of the VRR curve.

¹ See PJM Open Access Transmission Tariff (OATT) Attachment DD § 5.10(a)(v)(A).

1 Elimination of the ancillary services revenue offset of \$2,199 per MW-year would
2 mean that the prices on the capacity market demand curve (VRR curve) for each
3 MW level would be higher, which together with elimination of the individual unit
4 reactive revenue offsets that would increase offer prices on the supply curve, means
5 that the clearing prices for capacity that result from the interaction of the supply
6 curve and the VRR curve, would be higher. The result would be the recovery of
7 additional reactive capacity revenues in the price of capacity for all resources.

8 If there were no nonmarket recovery of reactive revenue, there would be no reactive
9 revenue offset to Net CONE and the demand curve would result in higher capacity
10 market prices, all else held constant. If there were no nonmarket recovery of reactive
11 revenue, there would be no reactive revenue offset to individual unit offers and the
12 supply curve would result in higher capacity market prices, all else held constant. If
13 there were no nonmarket recovery of reactive revenue, the shape and location of the
14 demand curve and the supply curve would give unit owners the opportunity to
15 recover all reactive capability costs in the capacity market.

16 This is how the capacity market is designed to work for all the costs of a generating
17 plant other than short run marginal costs, which are part of energy market offers.

18 Payments based on cost of service approaches result in distortionary impacts on
19 PJM markets. Elimination of the reactive revenue requirement and the recognition
20 that capital costs are not distinguishable by function would increase prices in the
21 capacity market. The VRR curve would shift to the right, the maximum VRR price
22 would increase and offer caps in the capacity market would increase. The simplest
23 way to address this distortion would be to recognize that all capacity costs are
24 recoverable in the PJM markets.

25 Applicants have made no argument about why the PJM markets cannot provide a
26 competitive opportunity to include all the costs of generation resources. Without
27 identifying specific costs for which this is not correct, there is no cost of service
28 basis for defining a rate under Schedule 2.

29 The best approach would be to eliminate cost of service rates for reactive capability
30 and allow for recovery of capacity costs through existing markets, including a
31 removal of any offset for reactive revenue in offers and in the capacity market
32 demand (VRR) curve. As I understand it, adoption of the best approach is not within
33 the scope of this proceeding. A second best approach would be to limit the revenue

1 requirement that could be filed for under the OATT Schedule 2 to a level less than
2 or equal to the reactive revenue credit included in the capacity market design, in the
3 VRR curve Net CONE value, currently \$2,199 per MW-year. As I understand it,
4 adoption of the second best approach is within the scope of this proceeding.

5 **Q 3. WHAT IS YOUR RESPONSE TO THE PRESIDING JUDGE'S SECOND**
6 **QUESTION?**

7 A. My response to the Presiding Judge's first question includes an answer to the second
8 question. The broader point is that the questions raised are about the inconsistencies
9 between the pre market cost of service paradigm and the market paradigm
10 introduced in PJM effective April 1, 1999. In the cost of service paradigm, cost
11 allocation methods primarily affected rate design. Cost allocation methods
12 determined which customers paid which costs, but customers together guaranteed
13 payment of all reasonable costs. The cost allocation methods do not identify the
14 parts of a generating unit that uniquely provide reactive power. Even if they did or
15 could, that is not a reason to collect revenues outside the market design. The level of
16 claimed reactive revenue associated with some units actually exceeds the level of
17 capacity market revenues.

18 **Q 4. WHAT IS YOUR RESPONSE TO THE PRESIDING JUDGE'S**
19 **TRANSCRIPT QUESTIONS?**

20 A. My most basic point is that there is no reason to have guaranteed revenues related to
21 reactive power in a market environment. As a result, there is no reason to continue
22 to have reactive cost of service cases and there is no reason for an offset. But,
23 recognizing that the potential for a market solution is in the PJM stakeholder process
24 and not in this proceeding, my point is that the capacity market design explicitly
25 accounts for reactive revenue from the reference resource used to define the VRR
26 curve, equal to \$2,199/MW-year. There is no reason to pay any resource more than
27 that for reactive. The PJM market design is intended to provide the opportunity for
28 capacity resources to earn a return on and of their entire investment in order to
29 provide an incentive to enter, to invest in upgrades and to exit.

30 I understand the Presiding Judge's suggested analogy between revenue crediting in
31 the traditional cost of service setting and the situation in PJM markets. But the PJM
32 market situation is very different. In the traditional cost of service paradigm,
33 customers guarantee the utility that all their reasonable costs will be paid. In that

1 case, when the utility earns additional market revenue from an asset for which
2 customers are paying all the costs, it is logical that the market revenue be credited to
3 customers.

4 The case of PJM markets is the opposite situation. In PJM markets, generation
5 owners invest in resources with an expectation of earning a return based on market
6 prices. In markets, investors are responsible for all of their own costs and risks and
7 the upside and the downside that result from actual market prices. In this situation, it
8 is not logical or reasonable that customers should be asked to pay for a significant
9 part of the asset on a guaranteed cost of service basis.

10 In PJM and in the market paradigm, the base case is that generators are in markets
11 and that returns are a function of market dynamics. Generators could receive more
12 than they expected or less than they expected, but there are no guarantees. In the
13 cost of service paradigm, the base case is that generators are guaranteed recovery of
14 all their costs, but no more.

15 But under the status quo, customers are required to pay guaranteed cost of service
16 rates for reactive power. The VRR curve in the PJM capacity market design is
17 based, for the current delivery year, on the assumption that this payment is
18 \$2,199/MW-year and that the balance of the generators' costs are addressed in the
19 capacity market. So in that broad sense, under the status quo, the reactive payments
20 of \$2,199/MW-year are a reduction from what generators may offer in the capacity
21 market, all else held equal. The actual market revenues received by generators are a
22 function of demand (VRR curve) and supply offers and may exceed 100 percent of
23 all cost including reactive or fall short of all costs.

24 **Q 5. DO YOU HAVE A RESPONSE TO FERN SOLAR WITNESS HORIGAN**
25 **RE INVESTOR TAX CREDITS (ITCS) AND THE CAPITAL RECOVERY**
26 **FACTOR (CRF)?**

- 27 A. Contrary to Witness Horrigan's statements (at 41:9), the manner in which the ITC is
28 used or accounted for by the recipient is not relevant to the calculation of the capital
29 recovery payments. Whether it is a direct offset to the tax liability or a payment or
30 series of payments from third party tax equity financing, the capital cost is reduced.
31 This is of course the reason for the ITC mechanism; it provides an incentive to the
32 project by reducing the cost. If recovery of the value of the ITC in a capital recovery

1 payment is allowed, as suggested by Witness Horigan, the incentive would be
2 doubled.

3 Witness Horrigan (at 50:11) is “not aware that the Commission has determined Dr.
4 Bowring’s CRF to be just and reasonable for use in setting reactive power rates.”

5 The MMU CRF approach is an internally consistent method based on a standard
6 financial model of investments in capital assets and the associated returns on and of
7 capital over the asset life that produce a constant annual revenue requirement. The
8 CRF approach has been approved by FERC for use in the calculation of PJM black
9 start service rates and the avoidable cost rate for a PJM capacity resources.^{2 3}

10 **Q 6. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 A. Yes.

2 OATT Schedule 6A Para. 18.

3 OATT Attachment DD § 6.8(a).

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DECLARATION

JOSEPH E. BOWRING states that I prepared the testimony to which this declaration is attached with the assistance of the staff of Monitoring Analytics, LLC, and that the statements contained therein are true and correct to the best of my knowledge and belief. Monitoring Analytics, LLC, is acting in its capacity as the Independent Market Monitor for PJM.

Pursuant to Rule 2005(b)(3) (18 CFR § 385.2005(b)(3), citing 28 U.S.C. § 1746), I further state under penalty of perjury that the foregoing is true and correct.

Executed on November 10, 2022.



Joseph E. Bowring