

STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF NORTHERN INDIANA )  
PUBLIC SERVICE COMPANY LLC FOR )  
APPROVAL PURSUANT TO IND. CODE §§ 8-1-2- ) CAUSE NO. 45403  
42(A), 8-1-8.8-11 OF TWO RENEWABLE ENERGY )  
POWER PURCHASE AGREEMENTS, INCLUDING )  
TIMELY COST RECOVERY. )

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

PUBLIC'S EXHIBIT NO. 3

REDACTED TESTIMONY OF OUCC WITNESS  
PETER M. BOERGER, PH.D

SEPTEMBER 8, 2020

Respectfully submitted,



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T. Jason Haas  
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Deputy Consumer Counselor

**TESTIMONY OF OUCC WITNESS PETER M. BOERGER, PH.D.**  
**CAUSE NO. 45403**  
**NORTHERN INDIANA PUBLIC SERVICE COMPANY**

**I. INTRODUCTION**

1 **Q: Please state your name and business address.**

2 A: My name is Peter M. Boerger, and my business address is 115 West Washington  
3 St., Suite 1500 South, Indianapolis, Indiana 46204.

4 **Q: By whom are you employed and in what capacity?**

5 A: I am employed by the Indiana Office of Utility Consumer Counselor (“OUCC”) as  
6 a senior economist, with the official job title of Senior Utility Analyst, in the  
7 Electric Division. A summary of my educational and professional background, as  
8 well as my duties and responsibilities at the OUCC, can be found in Appendix A.

9 **Q: What is the purpose of your testimony?**

10 A: The purpose of my testimony is to address the economic justification for Northern  
11 Indiana Public Service Company LLC’s (“NIPSCO”) proposal to enter into  
12 purchase power agreements (“PPA”) for power from two solar energy projects—  
13 the Brickyard Project located in Boone County, Indiana and the Greensboro Project  
14 located in Henry County Indiana.

15 **Q: What did you do to prepare your testimony in this case?**

16 A: I reviewed NIPSCO’s Petition, testimony, and discovery responses. I also  
17 participated in a teleconference with NIPSCO personnel.

18 **Q: To the extent you do not address a specific item in your testimony, should it be**  
19 **construed to mean you agree with NIPSCO’s proposals?**

20 A: No. Exclusions of any topics, issues or items NIPSCO proposes does not indicate

1 my approval of these topics, issues or items. Rather, the scope of my testimony is  
2 limited to the specific topics discussed herein.

3 **Q: How is your testimony organized?**

4 A: My testimony is presented in four sections, including:

5 **Section I:** Introduction (above);

6 **Section II:** Increased Proposed Solar Resource Prices in Comparison to NIPSCO's  
7 2018 IRP;

8 **Section III:** Effects of the Midcontinent Independent System Operator's ("MISO")  
9 Recent Solar Capacity Accreditation Studies; and

10 **Section IV:** Conclusions and Recommendations.

**II. INCREASED PROPOSED SOLAR RESOURCE PRICES IN COMPARISON  
TO NIPSCO'S 2018 IRP**

11 **Q: Are the solar resource costs presented in this case higher than the levels**  
12 **NIPSCO modeled in its 2018 IRP?**

13 A: Yes. NIPSCO witness Patrick N. Augustine presents \$30.24 as the capacity-  
14 weighted 21-year fixed price average of solar resources from NIPSCO's 2018 IRP.<sup>1</sup>

15 The Brickyard Project PPA's 20-year fixed price is \$████, █████% higher than the  
16 PPA price modeled in NIPSCO's IRP.

17 **Q: Is this significantly higher cost due to inflation?**

18 A: No. NIPSCO's 2018 IRP modeled the solar PPAs as having full output beginning  
19 in 2023. Thus, inflation was already reflected in the 2023 PPA costs and, therefore,

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<sup>1</sup> NIPSCO's Confidential Exhibit No. 2, Verified Direct Testimony of Patrick N. Augustine, page 10, line 2.

1 does not explain the cost increase presented in this case.

2 **Q: Does using levelized cost of electricity (“LCOE”) calculations lead to**  
3 **significantly different conclusions about the size of the cost increase for solar**  
4 **resources compared to what was modeled in NIPSCO’s IRP?**

5 A: No. The primary difference between the PPA cost comparison I have just described  
6 and the LCOE cost comparison Mr. Augustine presents is the inclusion of  
7 NIPSCO’s estimates for energy and capacity market prices in years 20 through 30.  
8 Including those far-in-the-future costs makes the cost increase look smaller on a  
9 percentage basis than the increase in PPA cost. However, even using Mr.  
10 Augustine’s LCOE calculations, the increase in cost is still almost █%.<sup>2</sup>

11 **Q: Is the Greensboro Project’s cost also higher than similar projects modeled in**  
12 **NIPSCO’s 2018 IRP?**

13 A: Yes. However, due to the separate battery capacity demand charge for this facility  
14 and the differing amounts of battery capacity, comparisons for this project, to make  
15 sense, have to be done on an LCOE basis. Using Mr. Augustine’s calculated  
16 LCOEs, which account for the difference in battery capacity and, again, use Mr.  
17 Augustine’s 30-year time horizon approach to evaluate this 20-year PPA, the cost  
18 increase of the Greensboro Project compared to the IRP-modeled cost is █%.<sup>3</sup>  
19 Again, price inflation does not play a role in this difference since the IRP modeled  
20 the PPA beginning in 2023.

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<sup>2</sup> Augustine Direct, page 13, identifies the LCOE from the IRP to be \$39.50 while he presents the LCOE of the Brickyard facility on the page to be \$█, an increase of █%.

<sup>3</sup> Augustine Direct, page 16, identifies the LCOE from the IRP PPA tranches, after accounting for the differences in battery capacity, to be \$44.20, while he presents the LCOE of the Greensboro facility in Figure 1 on page 18 of his testimony to be \$█, an increase of \$█ or █%.

1 **Q: Does NIPSCO dispute the Greensboro Project PPA costs are higher than those**  
2 **modeled in its 2018 IRP?**

3 A: No. NIPSCO accepts that costs are higher. However, Mr. Augustine presents cost  
4 differences lower than those I present above.

5 **Q: Is his comparison reasonable?**

6 A: No, it is not reasonable because his calculations are not comparing the cost of  
7 projects with the same types of ownership. Mr. Augustine's presentations<sup>4</sup> of the  
8 difference from IRP modeled costs compares the projects in this Petition to an  
9 average of IRP-modeled PPA and IRP-modeled "acquisition" costs. Acquisition  
10 costs are much higher than PPA costs, so including the cost of acquisition projects  
11 is comparing "apples and oranges." Including acquisition projects in the  
12 comparison leads to Mr. Augustine's misleadingly low LCOE difference  
13 (████████), whereas the \$████████ difference I calculate above is a true "apples-  
14 to-apples" comparison. Mr. Augustine presents "acquisition"-based calculations in  
15 a number of places in his testimony. These values serve only to confuse cost  
16 comparison and should be ignored, as they are not relevant to comparisons with  
17 PPA proposals, which is the subject of NIPSCO's Petition in this case.

18 **Q: What do you conclude about the cost of the Brickyard and Greensboro**  
19 **Projects proposed in this Petition compared to the costs modeled in NIPSCO's**  
20 **2018 IRP?**

21 A: Using NIPSCO's own calculations and excluding extraneous apples-to-oranges  
22 comparisons in NIPSCO's testimony, it is clear the cost of NIPSCO's proposed  
23 solar resources have increased significantly from those modeled just two years ago

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<sup>4</sup> Augustine Direct, page 17, line 8 – page 18, line 3, Shown in his Q/A 23 on pages 17 and 18 of his testimony.

1 in its 2018 IRP. The Brickyard Project increased approximately █% and the  
2 Greensboro Project increased about █%.<sup>5</sup>

3 **Q: What is the effect of these solar project costs being substantially higher than**  
4 **those NIPSCO modeled in its 2018 IRP?**

5 A: First and most directly, those higher costs will lead to consumer rates being higher  
6 than envisioned in NIPSCO's 2018 IRP. This is no small issue considering that the  
7 wellbeing of NIPSCO's residential customers and the competitiveness of its  
8 business customers relies on keeping rates as low as reasonably possible. NIPSCO  
9 apparently made a misjudgment in its Short-Term Action Plan that solar resource  
10 prices would not substantially increase in the short term, leading to NIPSCO  
11 receiving much higher cost responses than available just two years ago in its first  
12 request for proposal ("RFP"). The effects of these misjudged costs will grow as  
13 NIPSCO presents additional solar resource proposals grounded in its Short-Term  
14 Action Plan,<sup>6</sup> since the installed capacity from its current proposals represents  
15 about only 21%<sup>7</sup> of the total amount of solar capacity envisioned in that Plan.

16 There is another indirect but no-less-real effect of higher solar costs. The  
17 indirect effect is the consequence of such higher costs on the optimal expansion  
18 plans NIPSCO modeled in its 2018 IRP. If NIPSCO's solar resources had in its

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<sup>5</sup> The █% increase calculated earlier in my testimony relies on LCOE calculations that utilize estimates from years 21 through 30 of the time horizon that, explained for the Brickyard Project earlier, reduces the apparent size of the increase in the PPA itself. Thus, thinking of this as a █% increase in the PPA cost is reasonable.

<sup>6</sup> See Augustine Direct, page 19, line 4 – page 20, line 7, Q/A 25 for a discussion of NIPSCO's Short Term Action Plan.

<sup>7</sup> The two projects in this Petition represent 230 MW ICAP whereas NIPSCO's Short Term Action Plan, as stated on page 9, line 9 of Mr. Augustine's direct testimony is for 1,104 MW ICAP of solar.

1 2018 IRP been modeled to be [REDACTED] higher, other resource options would  
2 have been more attractive and NIPSCO's model may have selected a different  
3 resource mix. Thus, the higher solar costs NIPSCO is now seeing call into question  
4 whether the resources proposed in this case, which are part of NIPSCO's Short-  
5 Term Action Plan, should be reconsidered.

6 **Q: How does NIPSCO address these effects?**

7 A: Regarding the Greensboro Project, Mr. Augustine summarizes the cost effects as

8 [REDACTED]”<sup>8</sup>

9 which he characterizes as “small.”<sup>9</sup> Regarding the Brickyard Project, Mr.

10 Augustine characterizes it as “[REDACTED]”<sup>10</sup> the average LCOE for all IRP solar

11 resources.

12 **Q: How do you respond to those characterizations?**

13 A: Regarding the Greensboro Project, the [REDACTED] estimate relies on the [REDACTED]

14 “apples-to-oranges” comparison I address above. When using the proper LCOE

15 difference of [REDACTED], as I identify above, the NPVRR difference is more than [REDACTED]

16 as high as Mr. Augustine's calculation. Regarding the Brickyard Project, note Mr.

17 Augustine is again comparing to the LCOE “for all IRP solar resources,” which

18 include the higher cost “acquisition” projects—once more reflecting an apples-to-

19 oranges comparison.

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<sup>8</sup> Augustine Direct, page 18, line 9.

<sup>9</sup> Augustine Direct, page 19, line 14.

<sup>10</sup> Augustine Direct, page 17, line 13.

1 **Q: Does Mr. Augustine present additional information to attempt to make the**  
2 **Commission comfortable with the proposed Brickyard and Greensboro**  
3 **Projects' higher costs compared to the costs modeled in its 2018 IRP?**

4 A: Yes. In his final substantive Q&A he states the Short-Term Action Plan produces  
5 "substantial savings for NIPSCO's customers versus the alternatives."<sup>11</sup> In this  
6 statement, he is apparently attempting to inoculate NIPSCO from suggestions that  
7 it might need to rerun its IRP to reflect the higher solar costs we are now seeing.

8 **Q: How do you respond to that defense?**

9 A: The fact that NIPSCO's IRP identified significant savings for its preferred plan  
10 does not necessarily mean that the model would not have resulted in a significantly  
11 different resource mix had higher solar costs been modeled. A primary idea behind  
12 NIPSCO's Short-Term Action Plan was taking advantage of expiring federal  
13 income tax credits. The PPA prices NIPSCO received in its second RFP indicate  
14 the market has largely priced the expiration of those credits into these PPA prices.  
15 Thus, the urgency, as it pertains to NIPSCO fulfilling all aspects of its Short-Term  
16 Action Plan, has decreased.

### **III. EFFECTS OF MISO'S RECENT SOLAR CAPACITY** **ACCREDITATION STUDIES**

17 **Q: Has MISO's conception of solar resource capacity accreditation changed since**  
18 **NIPSCO's 2018 IRP modeling was performed?**

19 A: Yes. MISO now recognizes that, as the prevalence of solar resources increases,  
20 those resources will be unable to provide as much useable capacity as previously  
21 assumed. MISO created an initiative called "Renewable Integration Impact

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<sup>11</sup> Augustine Direct, page 20, lines 4-5.



1 Assessment” (“RIIA”),<sup>12</sup> which has been studying these future effects to understand  
2 how they might affect capacity accreditation for solar resources in the future. As a  
3 general statement, the more solar resources implemented, the lower the capacity  
4 accreditation or unforced capacity (“UCAP”) for each MW of solar installed  
5 capacity (“ICAP”).

6 **Q: Did NIPSCO incorporate these expected future effects as part of its 2018 IRP**  
7 **modeling?**

8 A: No. The first comprehensive RIIA document<sup>13</sup> presenting MISO’s position on these  
9 effects was issued after NIPSCO completed its 2018 IRP. While Mr. Augustine’s  
10 testimony does broach<sup>14</sup> effects related to MISO’s RIIA initiative (and MISO’s  
11 related Resource Availability and Need initiative), he addresses those effects in a  
12 limited manner and does not incorporate those effects as would be done in an IRP.

13 **Q: Is it reasonable to expect Indiana utilities should incorporate such effects into**  
14 **their IRPs?**

15 A: Yes. While this is a developing area, it is reasonable that IRPs should consider and  
16 incorporate some concrete reflection of these effects. I am aware Indianapolis  
17 Power & Light Company (“IPL”) and Vectren South Electric (“Vectren”) have  
18 incorporated some reflection of these effects in their most recent IRP modeling.<sup>15</sup>

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<sup>12</sup> The home location for this initiative on MISO’s web site is located at the following link:  
<https://www.misoenergy.org/planning/policy-studies/Renewable-integration-impact-assessment/#nt=>.

<sup>13</sup> “Renewable Integration Impact Assessment (RIIA) Assumptions Document Version 6” dated December  
2018 and available on the MISO web site at  
[https://cdn.misoenergy.org/RIIA%20Assumptions%20Doc\\_v7429759.pdf](https://cdn.misoenergy.org/RIIA%20Assumptions%20Doc_v7429759.pdf).

<sup>14</sup> Augustine Direct, footnote 10 and on page 15, lines 3-8.

<sup>15</sup> For IPL’s discussion of this effect see the section titled “Capacity Credit” found on page 77 of “2019  
IPL IRP Public Volume 1,” available at:

1 **Q: How would incorporating such effects affect the attractiveness of solar**  
2 **resources compared to other resources?**

3 A: Incorporating a reduction in the amount of capacity accreditation for each MW of  
4 ICAP solar would reduce the attractiveness of solar and, thus, could lead to fewer  
5 solar resources being selected in the optimal resources mix.

6 **Q: Would incorporating this effect have changed NIPSCO's preferred resource**  
7 **portfolio or its Short-Term Action Plan in its IRP?**

8 A: That is uncertain. However, this effect, along with the effect of solar costs being  
9 higher than modeled in NIPSCO's IRP (as discussed above) would both serve to  
10 reduce the attractiveness of solar and very well may have changed the optimal  
11 resource mix. Even if the higher PPA costs NIPSCO presented in this Petition were  
12 accepted by the Commission as reflecting current market prices for solar assets,  
13 NIPSCO's impending filing for approval of some higher-cost "acquisition" assets  
14 in completing its Short-Term Action Plan should be cause to consider whether the  
15 resource mix going forward needs to be reevaluated in the context of both higher  
16 solar costs and lower capacity accreditation.

#### **IV. CONCLUSIONS AND RECOMMENDATIONS**

17 **Q: What are your conclusions?**

18 A: 1) NIPSCO significantly misjudged the rising cost trajectory for solar resources  
19 when it crafted the Short-Term Action Plan in its IRP two years ago. Prices for  
20 solar resources, based on the results of NIPSCO's second RFP and related proposals

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[https://www.iplpower.com/About IPL/Regulatory/Filings/Integrated\\_Resource\\_Plan/](https://www.iplpower.com/About_IPL/Regulatory/Filings/Integrated_Resource_Plan/). For Vectren's discussion of this effect see "Section 5.7 MISO Capacity Credit" of "2019-2020 Vectren IRP - Volume 1 of 2," which begins on page 137 of that document and is available at <https://www.vectren.com/irp>.

1 in this proceeding, are much higher than NIPSCO could have obtained when it  
2 issued its 2018 IRP.

3 2) The higher solar costs NIPSCO is now seeing, compared to what it modeled in  
4 its IRP, along with revised MISO solar capacity accreditation expectations, increase  
5 the need to revisit NIPSCO's Short-Term Action Plan to consider whether a revised  
6 resource mix is appropriate.

7 3) Despite the higher costs, the OUCC is willing to accept the economic  
8 reasonableness of approving the projects in this case, given that the currently  
9 proposed projects represent a small share of all the Solar Projects proposed in  
10 NIPSCO's Short-Term Action Plan.

11 **Q: What are your recommendations resulting from those conclusions?**

12 A: Should the Commission approve NIPSCO's request despite the recommendations  
13 of OUCC witnesses Lauren M. Aguilar and Anthony A. Alvarez, the OUCC  
14 recommends NIPSCO be required to incorporate the higher solar prices it now sees  
15 in a rerun of its IRP modeling, with that rerun also including expected effects from  
16 MISO's RIAA studies. This revised modeling should be presented as part of  
17 evidence presented in any future petition to further implement NIPSCO's 2018 IRP  
18 Short-Term Action Plan.

19 **Q: Does this conclude your testimony?**

20 A: Yes.

**APPENDIX A - QUALIFICATIONS OF PETER M. BOERGER, PH.D.**

1 **Q: Please summarize your professional background and experience.**

2 A: My undergraduate education consisted of a Bachelor of Science degree in  
3 Mechanical Engineering from the University of Wisconsin-Madison and a  
4 Bachelor of Arts degree in Physics from Carthage College, through its 3-2  
5 engineering program. The extra year of liberal arts study during my undergraduate  
6 career allowed me to take significant coursework in business and economics,  
7 including courses in microeconomics, macroeconomics and accounting. After  
8 working as an engineer at a manufacturing company, my graduate training began  
9 at Purdue University (West Layette campus) in a program of Technology and  
10 Public Policy, resulting in a Master of Science in Public Policy and Public  
11 Administration. My training there included courses in microeconomic theory, cost-  
12 benefit analysis, operations research (cost minimization algorithms as might be  
13 used in utility economic optimization programs), and policy analysis. I came to  
14 Indianapolis and worked doing research and analysis at Legislative Services  
15 Agency and later at the Indiana Economic Development Council. Following those  
16 stints, I began working on my Ph.D. at Purdue University (West Lafayette campus)  
17 in Engineering Economics through Purdue's School of Industrial Engineering. That  
18 program required taking Ph.D.-level microeconomics classes, as well as additional  
19 work in operations research. During my time there I taught a 300-level engineering  
20 economy class for three semesters. While finishing my doctoral thesis I worked in  
21 policy research for the Indiana Environmental Institute in Indianapolis and then,

1 after obtaining my doctorate, went to work at the Indiana Office of Utility  
2 Consumer Counselor, starting as an economist in the Economics and Finance  
3 Division. During my 8 years there, I rose to Assistant Director of the Electric  
4 Division and then Director of that Division. In 2005 I left the Agency to pursue  
5 other interests, largely outside of utility regulation, and then returned in November  
6 of 2015 to work in my current position as a senior economist in the Electric  
7 Division, with the formal title of Senior Utility Analyst.

8 **Q: Please describe your duties and responsibilities at the OUCC.**

9 A: I review petitions submitted to the Commission for their economic justification and  
10 perform other duties as assigned by the Agency.

11 **Q: Have you previously testified before the Commission?**

12 A: Yes, I have testified before the Commission in a number of significant cases during  
13 the 1997 to 2005 timeframe. I also recently submitted testimony in a number of  
14 proceedings since my return to the agency.

**AFFIRMATION**

I affirm, under the penalties for perjury, that the foregoing representations are true.

*Peter M Boerger*

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Peter M. Boerger, Ph.D  
Senior Utility Analyst  
Indiana Office of Utility Consumer Counselor

Cause No. 45403  
NIPSCO, LLC

Date: September 8, 2020

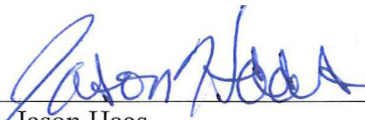
**CERTIFICATE OF SERVICE**

This is to certify that a copy of the foregoing *Indiana Office of Utility Consumer Counselor Public's Exhibit No. 3 Redacted Testimony of OUCC Witness Peter M. Boerger, Ph.D* has been served upon the following counsel of record in the captioned proceeding by electronic service on September 8, 2020.

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