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November 9, 2021

Ms. A. Shonta Dunston  
Chief Clerk  
North Carolina Utilities Commission  
430 N. Salisbury Street  
Raleigh, NC 27603

**RE: *In the matter of the Application for a Conditional Certificate  
of Public Convenience and Necessity for Juno Solar, LLC  
Docket No. EMP-116, Sub 0  
REBUTTAL TESTIMONY OF PIPER MILLER***

Dear Ms. Dunston:

On behalf of Juno Solar, LLC, in the above referenced matter and docket, I herewith provide the Rebuttal Testimony of Piper Miller in support of the Application for a Conditional Certificate of Public Convenience and Necessity. Confidential Exhibits to the Testimony will be forthcoming and filed under separate cover.

Please let us know if you will want or need paper copies of this filing, the number of copies of same, and we will promptly provide.

Thank you for your assistance with this application. Should you have any questions concerning this filing, please do not hesitate to contact me.

Sincerely,

/s/ Karen M. Kemerait

Karen M. Kemerait

A Pennsylvania Limited Liability Partnership

California Colorado Delaware District of Columbia Florida Georgia Illinois Minnesota  
Nevada New Jersey New York North Carolina Pennsylvania South Carolina Texas Washington



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Enclosures

**BEFORE THE  
NORTH CAROLINA UTILITIES COMMISSION  
JUNO SOLAR, LLC  
DOCKET NO. EMP-116, SUB 0**

**PRE-FILED REBUTTAL TESTIMONY  
OF  
PIPER MILLER**

**November 9, 2021**

1 **Q. Please state your name, title, and business address.**

2 **A.** My name is Piper Miller. I am Vice President of Development for Pine Gate  
3 Renewables, LLC (“Pine Gate Renewables”), and my business address is 130  
4 Roberts Street, Asheville, North Carolina 28801. Juno Solar, LLC (“Juno Solar” or  
5 “Applicant”) is wholly owned by Birch Creek Development, LLC (“Birch  
6 Creek”) and operated in collaboration with Pine Gate Renewables, which  
7 manages the development of Juno Solar’s proposed utility-scale solar  
8 photovoltaic (“PV”) generating facility.

9 **Q. Have you previously filed testimony in this docket?**

10 **A.** Yes. I filed direct testimony on July 12, 2021, revised direct testimony on July 26,  
11 2021, and supplemental direct testimony on September 14, 2021 in this docket.

12 **Q. What is the purpose of your rebuttal testimony?**

13 **A.** The purposes of my rebuttal testimony are to respond to testimony of Public Staff  
14 Witness Dustin R. Metz filed in this docket on October 26, 2021 and to support the  
15 requested Conditional Certificate of Public Convenience and Necessity (“CPCN”).

16 **Q. As a preliminary matter, in the Public Staff’s testimony, the Public Staff has**  
17 **chosen not to acknowledge any benefits that North Carolina customers will**  
18 **receive as a result of the Juno Solar facility. Please describe any such benefits**  
19 **to the North Carolina customers.**

20 **A.** Importantly, Juno Solar provides a substantial benefit to Duke Energy Progress,  
21 LLC (“DEP” or “Duke”) ratepayers that distinguishes it from the number of  
22 merchant solar projects interconnecting in the Dominion PJM region of North

1 Carolina about which the Commission has recently expressed concern. In order to  
2 “wheel” its output from its location in DEP territory to PJM, Juno Solar will have  
3 to procure point-to-point transmission service across the DEP system. This  
4 process is known and transparent, with current and forecasted rates being  
5 published by Duke periodically. The current rate for firm point-to-point  
6 transmission service across the DEP system is \$1,738 per MW-month. Reserving  
7 transmission capacity of 250 MW would result in approximately \$5.2 million per  
8 year in new point-to-point transmission revenues to DEP. These revenues  
9 contribute towards DEP’s Annual Transmission Revenue Requirement  
10 (“ATRR”), and are used by DEP to operate, maintain, and upgrade its  
11 transmission system. By contributing substantial revenues toward the ATRR,  
12 Juno Solar can be expected to reduce the burden for transmission spending that  
13 would otherwise ultimately fall on DEP’s various load customers.

14 These transmission rates are forecasted by Duke to rise substantially in the  
15 coming years, and Birch Creek projects Juno Solar to spend over \$275 million on  
16 point-to-point transmission over the life of the project. This is the only means by  
17 which Juno can deliver power to the PJM marketplace. These costs, not in any  
18 way reimbursable by ratepayers, will, under any reasonable assumptions, far  
19 exceed the costs of network upgrades to which ratepayers might be subject. **Even**  
20 **at the high end of a \$4/MWh LCOT, Juno Solar’s projected contribution of**  
21 **point-to-point transmission revenues to DEP still exceeds its reimbursable**  
22 **network upgrade costs by roughly a factor of five.** In Birch Creek’s view, the

1 magnitude of these new transmission revenues for DEP is a benefit entirely  
2 sufficient to allay concerns over ratepayer exposure to interconnection and  
3 affected system costs, and it is puzzling that the Public Staff chose to entirely  
4 ignore this customer benefit in its testimony.

5 **Q. Public Staff Witness Metz states that Juno Solar's request that the**  
6 **Commission issue a Conditional CPCN to the project will not solve the "Catch**  
7 **22" problem noted in your Direct Testimony. (Public Staff Witness Metz**  
8 **Testimony, pp. 5-6) Is the Public Staff's statement correct?**

9 **A.** No. While it would not eliminate all risk associated with interconnection, the  
10 Commission's issuance of a CPCN to Juno Solar would appropriately mitigate the  
11 substantial financial risk that Juno Solar would face if it had to withdraw from the  
12 Transition Cluster Study if the Commission were to deny its CPCN Application.  
13 Thus, with a Conditional CPCN, Juno Solar will be able to enter the Transitional  
14 Cluster and incur the associated financial exposure without an unacceptable level  
15 of uncertainty about whether the Commission will issue a CPCN for the facility.

16 **Q. Do you agree with the Public Staff's claim that Juno Solar would still be**  
17 **subject to the same financial risk of withdrawal from the Transitional Cluster**  
18 **Study even if the Commission issued a Conditional CPCN? (Public Staff**  
19 **Witness Metz Testimony, pp. 5-6)**

20 **A.** No. DEP has not yet studied whether any Network Upgrades will be required to  
21 interconnect Juno Solar and the other projects in the Transitional Cluster, and if so,  
22 the Network Upgrade costs that will be assigned to Juno Solar. However, Juno Solar



1 has completed a detailed injection analysis of the project to identify any anticipated  
2 transmission overloads and potential Network Upgrade costs. The study modeled  
3 an array of planning and dispatch scenarios, and found modest Network Upgrades  
4 needed under all but the most conservative planning scenarios (e.g., the full volume  
5 of the interconnection queue coming into service). Juno Solar has entered the  
6 Transitional Cluster and will go through the interconnection study process with  
7 DEP to identify any specific Network Upgrades needed to interconnect the project.  
8 By way of Juno Solar's injection analysis of the project, Juno Solar believes that  
9 the Levelized Cost of Transmission ("LCOT") for any required Network Upgrades  
10 and Affected System Upgrades assigned to the project will be no greater than \$4.00  
11 per MWh, and in all likelihood substantially lower than that value. With a CPCN  
12 that is conditioned on the LCOT for any assigned Network Upgrades being no  
13 greater than the specific defined amount of \$4.00 per MWh, Juno Solar will have  
14 adequate assurance that it will not need to withdraw from the Transitional Cluster  
15 Study and forfeit substantial sums as a withdrawal penalty.

16 **Q. The Public Staff also states that Juno Solar is attempting to "shift" the risk**  
17 **from Juno Solar to the North Carolina ratepayers through the Conditional**  
18 **CPCN Application. (Public Staff Witness Metz Testimony, p. 5) Is the Public**  
19 **Staff's concern valid?**

20 **A.** No. Contrary to the Public Staff's assertion, the Commission's issuance of a  
21 Conditional CPCN to Juno Solar would provide an appropriate solution for the  
22 "Catch 22" problem that would in no way "shift" risk from Juno Solar to the North

1 Carolina ratepayers. Juno Solar has proposed a reasonable condition to the CPCN  
2 to ensure that that the ratepayers will not have to provide reimbursement for  
3 Network Upgrade costs and Affected System costs that are too high. Juno Solar's  
4 proposed condition will ensure that the LCOT for any assigned Network Upgrade  
5 costs and Affected System costs from the study processes will be no greater than  
6 \$4.00 per MWh. The conditions to Juno Solar's CPCN Application are *designed*  
7 to provide ample protection for the ratepayers from unreasonably high Network  
8 Upgrade.

9 **Q. Do you believe that FERC-jurisdictional Interconnection Customers might be**  
10 **dissuaded from entering Phase 2 of Duke's Cluster Study if they will face**  
11 **million dollar withdrawal penalties if they exit the study process because their**  
12 **CPCN is denied?**

13 **A.** Yes. I believe that the uncertainty of whether the Commission will grant a CPCN  
14 to a merchant plant facility might dissuade FERC-jurisdictional Interconnection  
15 Customers from entering Phase 2 of the Cluster Study due to the magnitude of the  
16 withdrawal penalties. The Public Staff does not disagree. In response to Juno  
17 Solar's Data Request No. 1 to the Public Staff, the Public Staff stated that "[t]he  
18 Public Staff does not dispute the uncertainty regarding whether a CPCN would be  
19 granted may lead a potential Interconnection Customer to decide not to enter the  
20 Transitional Cluster Study." I believe that any policy that would discourage  
21 merchant plants from even entering the Transitional Cluster Study—when there are



1 solutions to mitigate the financial risk, such as Juno Solar's proposed Conditional  
2 CPCN—would be both inappropriate and unfair to merchant plant applicants.

3 **Q. Do you agree with the Public Staff's position that the Commission cannot**  
4 **make a “fully informed” decision on Juno Solar's CPCN Application until**  
5 **the interconnection studies have been completed? (Public Staff Witness Metz**  
6 **Testimony, p. 6)**

7 **A.** No, the Public Staff's position is incorrect. The Commission will be able to make  
8 a fully informed decision on Juno Solar's Conditional CPCN Application because  
9 Juno Solar has proposed a binding and enforceable condition that the LCOT for  
10 any assigned Network Upgrade costs and Affected System costs from the study  
11 processes will be no greater than \$4.00 per MWh. Juno Solar's power flow  
12 analysis shows that the Network Upgrade costs will most likely be around \$13  
13 million, and would be closer to \$16.84 million in the worst-case scenario. The  
14 worst-case scenario assumes that 100% of the Network Upgrade costs would be  
15 assigned to Juno Solar and that none of those costs would be assigned to any other  
16 project in the Transitional Cluster. Under both the likely scenario and the worst-  
17 case scenario, Public Staff Witness Metz agrees that the costs are reasonable in  
18 both magnitude and in LCOT. Therefore, the Public Staff's claim that the  
19 Commission cannot make a “fully informed” decision about Juno Solar's CPCN  
20 Application and impact to ratepayers is both misleading and incorrect.

21 **Q. The Public Staff notes that the Department of Natural and Cultural**  
22 **Resources has recommended a comprehensive archaeological assessment of**

1        **the property. (Public Staff Witness Metz Testimony, pp. 9-10) Has the**  
2        **archaeological assessment of the property been performed?**

3        A.     Juno Solar has executed a proposal for the completion of an archaeological survey  
4        as recommended by the Department of Natural and Cultural Resources. The  
5        results of the study are expected within three to four months (February to March  
6        2022).

7        Q.     **The Public Staff expresses concern that the nameplate capacity for Juno**  
8        **Solar might ultimately be reduced due to potential site constraints, and**  
9        **therefore requested a more detailed site plan. (Public Staff Witness Metz**  
10       **Testimony, pp. 8-9) Is the Public Staff's concern valid?**

11       A.     No. Public Staff Witness Metz notes that “given my experience with the Public  
12       Staff reviewing CPCN applications for solar facilities, it is not uncommon for  
13       sites to have numerous modifications to the site layout and boundaries, and even  
14       changes in nameplate capacity prior to project completion.” (Public Staff Witness  
15       Metz, p. 8) We agree with the Public Staff that solar developers frequently make  
16       modifications to the site layout and boundaries and sometimes revise the facility’s  
17       nameplate capacity prior to project completion. However, prior to the Public  
18       Staff’s testimony in this docket, the Public Staff had never suggested that the  
19       Commission should not issue a CPCN simply because the project might undergo  
20       site changes prior to project completion. Thus, the Public Staff’s position is not  
21       only a novel position, but the Public Staff has singled out Juno Solar for its newly  
22       expressed position.

1 In response to the Public Staff's request for a more detailed site plan, I  
2 want to make it clear that Juno Solar filed a revised detailed site plan that shows  
3 all significant site features, including the wetlands, on the property on July 26,  
4 2021. On July 27, 2021, the Public Staff filed notice that Juno Solar's Conditional  
5 CPCN Application, that includes the revised detailed site plan, is complete and  
6 meets the requirements of Rule R8-63. Even though the Public Staff has  
7 acknowledged that Juno Solar's Conditional CPCN Application is complete and  
8 in compliance with Rule R8-63, Juno Solar is willing to file an even more detailed  
9 site plan in the docket if material changes are made upon further refinement.

10 However, the Public Staff's suggestion that any possible modifications to  
11 the site might make the site "incapable of supporting a facility that can produce  
12 the total energy utilized in the initial calculation of the LCOT [and that] the true  
13 LCOT may be substantially greater than what is being relied upon in determining  
14 whether to grant the CPCN" is a flawed risk assessment. (Public Staff Witness  
15 Metz Testimony, pp. 8-9) By the same token, a downsizing of the Juno Solar  
16 facility could alleviate constraints on the system and materially reduce its  
17 Network Upgrade costs (effectively the "numerator" in the LCOT calculation) as  
18 readily as a reduction in generation (effectively the "denominator" of LCOT)  
19 might materially increase LCOT. Indeed, preliminary internal analysis has  
20 suggested this could be the case with a downsizing of the facility. This analysis is  
21 inconclusive without knowing the composition of the Transitional Cluster, but

Birch Creek will once again study this dynamic once the full set of cluster projects is known.

**Q. The Public Staff claims that Juno Solar cannot provide an accurate or useful power flow analysis. (Public Staff Witness Metz Testimony, p. 13) Is the Public Staff's opinion correct?**

**A.** Birch Creek's power flow analysis provides useful guidance and insight into the potential costs and risks of Network Upgrade requirements associated with the Juno Solar facility, and should be viewed as such. The study was performed with conservative assumptions and the best information Birch Creek had available at the time. As discussed in response to the previous question, Birch Creek acknowledges that this study is not fully conclusive without knowing the composition of the Transitional Cluster. This study will be updated as that composition is determined, and Birch Creek is willing to brief the Public Staff on any substantial changes to its findings. In any case, Birch Creek's results do not hinder the Commission in issuing a CPCN conditional upon ultimate costs, and Birch Creek's preliminary Network Upgrade cost findings reflect ample headroom below what it believes are just and reasonable levels.

**Q. The Public Staff states that Juno Solar's power flow analysis should have included a winter study and possibly a shoulder season study. (Public Staff Witness Metz Testimony, p. 13) Do you agree with the Public Staff's opinion?**

**A.** The primary study hour for generation interconnection requests is 1 p.m. on a summer peak day with customer load at 90% of peak and solar generation at



1 100%, due largely to significant solar generation in DEP. For projects that have  
2 solar plus storage, DEP will perform a winter peak analysis in addition to the  
3 summer peak analysis. Juno Solar is a closed loop solar plus storage project which  
4 means that it is DC coupled and will not charge from the transmission grid. That  
5 being said, Birch Creek performed a winter peak screening in addition to the  
6 summer peak study to model the discharge of the interconnection request during  
7 winter peak hour. Birch Creek did not identify new constraints during winter  
8 peak. DEP does not outline or mention the use of shoulder season studies for  
9 generation interconnection requests in their base case data dictionaries, nor there  
10 are FERC 845 shoulder season cases available.

11 **Q. Please response to the Public Staff's concerns about the Affected System**  
12 **studies and the Transitional Cluster Study. (Public Staff Witness Metz**  
13 **Testimony, pp. 23-25)**

14 **A.** Juno Solar will agree not to seek reimbursement for any Duke Energy Affected  
15 System Upgrade costs that may be incurred. Juno Solar's agreement thus removes  
16 the Public Staff's source of concern around the Affected System evaluation  
17 process, both from a study timing perspective and a ratepayer cost risk  
18 perspective.

19 **Q. Does the Public Staff agree that PJM has identified a need for new**  
20 **generation in terms of both energy and capacity? (Public Staff Witness Metz**  
21 **Testimony, p. 29)**



1 A. Yes. The Public Staff clearly states that PJM has identified the need for new  
2 generation and capacity. (Public Staff Witness Metz Testimony, p. 28)

3 Q. **Please summarize PJM's most recent (2021) Load Forecast Report.**

4 A. The Public Staff agrees with Juno Solar that PJM's 2021 Load Forecast Report  
5 demonstrates the need for new generation for energy and capacity. As noted in my  
6 initial testimony, Commercial and Industrial ("C&I") demand for clean energy in  
7 the PJM market is stronger than ever in the market's history and continues to grow.  
8 The year 2020 saw yet another increase in C&I demand for renewable energy,  
9 despite the challenges of the Covid-19 pandemic. LevelTen Energy, which matches  
10 renewable energy buyers and sellers and provides insight into nationwide  
11 renewable PPA pricing, noted an increase in solar PPA prices in PJM over the past  
12 two years, with a steady escalation in price from Q1 2019 to Q4 2020. As Birch  
13 Creek cited previously in this docket, "The convergence of more challenging local  
14 and state permitting regimes, prohibitively high grid upgrade costs, and a surge in  
15 buyer demand has resulted in a PJM market that is short in project supply, which  
16 has in turn led to rising PPA prices" observed Rob Collier, Vice President of  
17 Developer Relations at LevelTen, in its Q4 2020 Energy PPA Price Index. The  
18 report found PJM Solar PPA prices to be the highest of any ISO or RTO in the  
19 country. This finding has held in subsequent reports, with the most recent (released  
20 in October 2021) finding the highest 25<sup>th</sup> percentile price at \$37.50/MWh, and  
21 noting that even this price was depressed by a clustering of projects in AEP-Dayton

1 Hub region, and that PJM's Dominion Hub is almost certainly experiencing higher  
2 pricing.

3 Furthermore, the Public Staff reports that PJM is expecting peak load  
4 growth of 0.3% for the next 10 years and 0.2% over the next 15 years, with a  
5 summer forecasted peak of 153,759 MW in 2031 and winter forecasted peak of  
6 135,568 MW in 2030/2031. Thus, the information and reports about future energy  
7 needs in PJM relied upon by both Juno Solar and the Public Staff clearly  
8 demonstrates the need for the Juno Solar facility.

9 **Q. Even though the Public Staff recognizes that PJM has a need for new**  
10 **generation, does the Public Staff nonetheless conclude that Juno Solar has**  
11 **not demonstrated a need for the facility? (Public Staff Witness Metz**  
12 **Testimony, p. 28)**

13 **A.** Yes, the Public Staff makes a convoluted argument that there might not be a need  
14 for the Juno Solar facility because the Public Staff finds it "doubtful" that PJM's  
15 energy and capacity needs are solely dependent on the Juno Solar facility. (Public  
16 Staff Witness Metz Testimony, p. 28) Juno Solar's burden to show the need for  
17 the generating facility is not a complicated one. A merchant plant does not need  
18 to show—and a merchant plant has never been required to show—that an  
19 electric public utility's need for energy must be met solely by the proposed  
20 merchant plant generating facility.

1   **Q.     Other than the Friesian Holdings, LLC CPCN application and Juno Solar's**  
2   **Conditional CPCN Application, has the Public Staff ever taken the position**  
3   **that a merchant plant applicant has not demonstrated a need for the facility?**

4   **A.**     No. Juno Solar has performed an analysis of merchant plant CPCN  
5   dockets after the Commission adopted Rule R8-63 in the wake of its 1992  
6   decision regarding Empire Power Company's merchant plant CPCN application.  
7   *See Order on Motion to Dismiss*, issued on April 23, 1992 in Docket No. SP-  
8   91. With the exception of the Public Staff's position in Friesian Holdings, LLC's  
9   ("Friesian") CPCN application in Docket No. EMP-105, Sub 0 that Friesian had  
10   not demonstrated a need for the generating facility, Juno Solar's analysis of  
11   merchant plant CPCN dockets demonstrates that the Public Staff has taken the  
12   position that the merchant plant CPCN applicant had not shown the need for the  
13   facility in only two merchant plant CPCN proceedings. Those two merchant plant  
14   dockets are Friesian's CPCN docket and now Juno Solar's Conditional CPCN  
15   docket.

16           The Public Staff has confirmed Juno Solar's analysis. The Public Staff  
17   responded to Juno Solar's Data Request No. 1 as follows:

18           Question No. 29.     Has the Public Staff ever previously found that a  
19   merchant plant has not demonstrated the need for the facility when PJM  
20   has demonstrated the need for new generation, both energy and capacity?  
21   If so, please provide the docket number for all merchant plant CPCN  
22   applications in which the Public Staff has taken that position.

1            Response: See the response to Question No. 28 above. The Public Staff  
2            has not taken that position in any recent docket other than the Friesian  
3            CPCN application and given the time allowed to respond to this data  
4            request, is not able to research the question beyond the last 24 months (as  
5            provided in chart in response to Question No. 21). However, the Public  
6            Staff has taken various positions in EMP dockets based upon  
7            circumstances at the time it filed testimony in these dockets. These  
8            positions have ranged from recommendations for approval with conditions  
9            addressing updated networking upgrade costs to recommendations to hold  
10           the application in abeyance until study costs are known. The Public  
11           Staff's recommendation for the need for a generating facility is based on  
12           many factors to include location, generating capacity, generation  
13           technology, and commercial operation date.

14    **Q.    In earlier testimony, you stated that Juno Solar was in the process of**  
15           **attaining a PPA term sheet, which would serve to demonstrate the need for**  
16           **the project. Has any progress been made?**

17    **A.**    Yes. Juno Solar has executed a term sheet from a large, investment-grade retail  
18           and wholesale energy provider in PJM, corroborating the need for renewable  
19           energy in the Dominion region of PJM noted in the previously cited LevelTen  
20           report and demonstrating need for this project. This PPA term sheet is provided as  
21           Confidential Attachment A – PPA Term Sheet.



1 In Birch Creek's view, this term sheet represents an equal or greater  
2 burden of proof than met in the course of recently approved CPCN documents,  
3 including those of Fern Solar, LLC (Docket No. EMP-104, Sub 0), Halifax Solar,  
4 LLC (Docket No. EMP-107, Sub 0), American Beech Solar, LLC (Docket No.  
5 EMP-108, Sub 0), Sumac Solar, LLC (Docket No. EMP-110, Sub 0), and  
6 Shawboro Solar, LLC (Docket No. EMP-117, Sub 0).

7 **Q. In light of the recent enactment of S.L. 2021-165 ("H.B. 951"), will there be**  
8 **further need in North Carolina for non-carbon emitting generation on the**  
9 **Duke Energy system to serve load to reduce emissions by 70% over 2005**  
10 **levels by 2030?**

11 **A.** Yes. There will certainly be a substantial need for new non-carbon emitting  
12 generation on the Duke Energy system both in the short-term and in the long-term  
13 to serve load and reduce CO2 emissions.

14 **Q. Does the passage of H.B. 951 add a new dimension to the need for the Juno**  
15 **Solar facility?**

16 **A.** Yes, it does. The 70% decarbonization by 2030 mandate established by the  
17 General Assembly means that a massive amount of solar energy resources will  
18 have to be added to Duke's system over the next nine years. Duke's Integrated  
19 Resource Plan ("IRP") pending before the Commission shows that amount to be  
20 at least 9 GW, although intervenors have put on evidence that would support a  
21 much higher number. Duke's modified IRP filed in South Carolina suggests,  
22 by Duke's own analysis, that the amount of required solar energy resources could



1 be closer to 11 GW. Thus, while the exact amount of solar additions will be  
2 determined in the carbon reduction plan to be developed by the Commission next  
3 year, it is highly likely that Duke will be adding a minimum of 1 GW, and  
4 perhaps as much as 1.5 GW, of solar per year throughout the next decade. Under  
5 H.B. 951, 55% of that amount will be owned by Duke and procured through  
6 facility purchases from third parties or by self-development. In addition, there is  
7 no size cap on Duke-owned solar, which means that the least-cost mandate of  
8 H.B. 951 will almost certainly drive the procurement of larger facilities with  
9 greater economies of scale. There are currently only five solar facilities in DEP  
10 and DEC's combined interconnection queues with a capacity greater than 150  
11 MW. In light of transmission and other development constraints, it is very likely  
12 that Juno Solar would be one of the most cost-effective options for Duke to  
13 achieve compliance with H.B. 951.

14 **Q. But should the Commission wait to grant a CPCN to Juno Solar until it is**  
15 **determined whether Duke will in fact purchase the Juno Solar facility?**

16 **A.** No. As we have explained, the need for the immediate issuance of the  
17 Conditional CPCN is to solve the Catch 22 problem presented by the recently  
18 adopted Transitional Cluster Study rules. There is absolutely no harm to  
19 ratepayers in issuing the conditional CPCN. Juno Solar is willing to accept an  
20 additional condition to the CPCN that its CPCN will automatically terminate if  
21 Juno Solar does not either contract for the sale of energy or the sale of the facility  
22 during the life of the CPCN. As an aside, there is no risk that Juno Solar would

1 never construct the facility if it did not have a contract for the sale of the energy or  
2 the sale of the facility. Juno Solar will not be able to obtain financing to construct  
3 the facility unless it has either a contract for the off-take of the facility or a  
4 contract to sell the facility to Duke.

5 **Q. Despite the enactment of HB 951, the Public Staff questions whether Juno**  
6 **Solar will displace existing CO<sub>2</sub>-emitting resources in PJM territory. (Public**  
7 **Staff Witness Metz Testimony, pp. 25-26) Please describe how Juno Solar**  
8 **will displace CO<sub>2</sub>-emitting resources.**

9 **A.** The Public Staff's implication that Juno may not displace CO<sub>2</sub>-emitting resources  
10 in PJM, or must demonstrate through independent study that it will do so, is  
11 puzzling. A basic understanding of economic dispatch in power markets and the  
12 resource mix of PJM conveys it to be effectively impossible that Juno would not  
13 displace a substantial amount of CO<sub>2</sub>-emitting generation.

14 In PJM, broadly speaking, hours with locational marginal prices ("LMPs")  
15 substantially greater than zero can be characterized as having gas- or coal-fired  
16 generation setting the marginal clearing price, given its significant variable cost  
17 per megawatt-hour (unlike zero- or low-marginal cost solar and wind  
18 generation)<sup>1</sup>. Adding solar generation onto the system will, by definition, displace  
19 marginal generation, which in solar-generating hours overwhelmingly comes  
20 from CO<sub>2</sub>-emitting resources. Birch Creek finds a solar generation-weighted

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<sup>1</sup> Nuclear generation typically carries a low variable cost, and is dispatched well before the marginal unit (base load) in the case of Juno Solar's projected operating hours in PJM.

1 average LMP for the Juno Solar facility of \$29.69/MWh for the past  
2 approximately three years at its applicable SOUTH import point in PJM, the  
3 result of CO<sub>2</sub>-emitting natural gas and coal generation setting the marginal  
4 clearing price in the extreme majority of these solar-generating hours<sup>2</sup>, and found  
5 no instances of a \$0 LMP (which would indicate a renewable or zero marginal  
6 cost resource setting the margin) during a solar-generating hour, based on Juno  
7 Solar's forecasted 8,760 operating profile.

8 **Q. Does this conclude your testimony?**

9 **A. Yes.**

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<sup>2</sup>In PJM's 2021 State of the Market Report, PJM's Independent Market Monitor found that natural gas generating units set the marginal clearing price in 68.7% of hours and coal units set the marginal clearing price in 16.8% of hours for the real-time market. The remaining marginal clearing prices are primarily set by wind and fall outside of Juno Solar's hours of operation.