

STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH

DOCKET NO. E-100, SUB 180

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:	)	<u>JOINT REPLY COMMENTS</u>
Investigation of Proposed Net Metering	)	<u>OF NC WARN, NCCSC AND</u>
Policy Changes	)	<u>SUNRISE DURHAM</u>

Pursuant to the North Carolina Utilities Commission's ("NCUC" or "Commission") *Order Requesting Comments* entered on January 10, 2022 in the above-referenced docket, as extended by the Commission's *Order Granting Extension of Time* entered on April 25, 2022, Intervenor NC WARN, North Carolina Climate Solutions Coalition ("NCCSC"), and Sunrise Movement Durham Hub ("Sunrise Durham") (collectively, "NC WARN *et al.*"), through undersigned counsel, hereby submit the following Joint Reply Comments:

**SUMMARY OF JOINT REPLY COMMENTS**

As described in detail within NC WARN *et al.*'s Initial Comments, the Commission should reject the net energy metering ("NEM") tariffs proposed by Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (collectively, the "Companies"). The present Reply Comments specifically address the following issues within the initial comments filed by other intervenors in this docket:

- Based on the initial comments filed in this docket, there is widespread agreement that the Companies have not conducted the "investigation

of the costs and benefits of customer-sited generation” required by House Bill 589.<sup>1</sup> To the contrary, the Companies’ Joint Application is supported merely by marginal and embedded cost studies which were prepared internally by the Companies themselves. In no meaningful sense has an “investigation”—as required by House Bill 589—been conducted.

- As recognized in the initial comments of other intervenors, the Companies’ purported cost-benefit analysis—which is actually just a marginal and embedded cost study—failed to meaningfully analyze the **benefits** of NEM solar. In fact, it appears that the only intervenor to endorse the Companies’ supposed cost-benefit analysis is the Public Staff, yet the Public Staff’s argument is analytically flawed and completely ignores the standard of care which controls the performance of a cost-benefit analysis.

- In their initial comments, several intervenors identify specific benefits of NEM solar which the Companies failed to capture. For instance, in their Initial Comments, NCSEA, SACE and Vote Solar (collectively, “NCSEA *et al.*”) correctly noted that “there are several benefits of distributed renewable generation that DEC and DEP have not quantified,” including “avoided costs for carbon emissions and fuel hedging benefits, which combined could add approximately 4 to 5 cents per kWh to the benefits.”<sup>2</sup> When appropriate corrections are made, it becomes obvious that the Companies’ claims of a “cost-shift” are unfounded. In fact, NEM solar is a net benefit to ratepayers.

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<sup>1</sup> N.C. Gen. Stat. § 62-126.44(b).

<sup>2</sup> NCSEA *et al.*’s Initial Comments, p. Exhibit A, p. 6, footnote 7.

- Nearly all intervenors agree that the Companies' proposed NEM tariffs would drastically reduce the economic value of rooftop solar for NEM customers. By way of example but not limitation, the Public Staff concluded that the average bill for the top quartile of NEM customers would increase by as much as 118.53% under the proposed NEM tariffs.<sup>3</sup> Given current North Carolina policies which require a reduction in carbon emissions, this disincentivization of rooftop solar is unacceptable and should be rejected.

- In their initial comments, other intervenors made a compelling argument that the proposed NEM tariffs are too complicated and vague, which will make it impossible for solar customers to project savings.

- The proposed NEM tariffs discriminate against NEM solar customers and otherwise violate PURPA.

For all of these reasons, among others, the Companies' proposed NEM tariffs should be rejected. As described in more detail within NC WARN *et al.*'s Initial Comments, the Commission should lead a cost-benefit analysis of solar generation, which should include a Commission-led Value of Solar Study. Only upon the conclusion of these studies should new NEM tariffs be proposed by the Companies.

#### **INDEX OF ATTACHMENTS TO JOINT REPLY COMMENTS**

NC WARN *et al.* retained William E. Powers ("Mr. Powers"), an engineer with over thirty-five (35) years of experience in energy and environmental engineering, to evaluate the proposed NEM tariffs and the initial comments filed

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<sup>3</sup> The Public Staff's Initial Comments, p. 32.

by various intervenors in the present docket. Mr. Powers' *Report Responding to the Initial Comments of the Public Staff and NCSEA Et. Al.* is attached hereto as **Attachment A** (the "Reply Report"). The following is a list of the attachments filed contemporaneously with these Reply Comments, all of which are either cited in these Reply Comments or in Mr. Powers' Reply Report:<sup>4</sup>

- Attachment A: Report Responding to the Initial Comments of the Public Staff and NCSEA *Et. Al.*, by Mr. Powers;
- Attachment B: The Companies' Response to the Public Staff's Data Request No. 3-3;
- Attachment C: The Companies' Response to NC WARN's Data Request No. 1-11; and
- Attachment D: The Companies' Response to the Public Staff's Data Request No. 1-28.

### **DISCUSSION**

The present Reply Comments focus on certain issues within the initial comments filed by other intervenors in the present docket, and the lack of response to any argument should not be interpreted as agreement. Large portions of this discussion constitute summaries of Mr. Powers' Reply Report, which Reply Report should be consulted for additional details and supporting citations.

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<sup>4</sup> In response to several data requests, the Companies produced voluminous spreadsheets in native Excel format. In certain instances, those spreadsheets included intact formulas to allow the parties to make calculations. As a result, it was not possible to convert certain Excel spreadsheets into Adobe PDF format for filing purposes. Specifically, undersigned counsel has omitted the Excel spreadsheets from the following discovery response: **Attachment C**, the Companies' Response to NC WARN's Data Request No. 1-11. Upon request, undersigned counsel will provide the native Excel spreadsheet referenced above to Commission staff or the parties.



I. **There Is Widespread Agreement that the Companies Failed to Conduct the “Investigation” Required by House Bill 589.**

House Bill 589 prohibits the establishment of new NEM tariffs until after an “investigation” is conducted regarding customer-sited generation. The applicable statute states:

**§ 62-126.4. Commission to establish net metering rates.**

....

(b) **The rates shall be nondiscriminatory and established only after an investigation of the costs and benefits of customer-sited generation.** The Commission shall establish net metering rates under all tariff designs that ensure that the net metering retail customer pays its full fixed cost of service. . . .<sup>5</sup>

In our Initial Comments, NC WARN *et al.* established that this requirement of an “investigation” includes a Commission-led cost-benefit analysis, including a Value of Solar Study.<sup>6</sup> Additionally, NC WARN *et al.*’s Initial Comments proved that the Companies have failed to conduct this statutorily mandated “investigation of the costs and benefits of customer-sited generation.”<sup>7</sup>

Indeed, there is seemingly widespread agreement among the intervenors that the Company has not conducted the required “investigation.” For instance, the Attorney General’s Office’s (“AGO”) Initial Comments stated: “the AGO believes that it would be prudent for the Commission to **delay reaching a decision on these revised [NEM] rates until a sufficient investigation has been done**

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<sup>5</sup> N.C. Gen. Stat. § 62-126.4(b) (second emphasis added).

<sup>6</sup> NC WARN *et al.*’s Initial Comments, pp. 9-14.

<sup>7</sup> *Id.* at 14-22.

regarding the costs and benefits of customer-sited generation—an investigation that may not be possible until later in the Carbon Plan process.”<sup>8</sup>

The Companies will argue that the mandatory “investigation” was satisfied by the Rate Design Stakeholder Process. NC WARN *et al.*’s Initial Comments addressed and rebutted this argument.<sup>9</sup> Similarly, the AGO correctly rejected the Companies’ argument that the Rate Design Stakeholder Process satisfies the requirement of an “investigation”:

While the Comprehensive Rate Design Study investigated the costs of customer-sited generation, **it did not analyze potential benefits of customer-sited generation**. These potential benefits are many—from reducing carbon emissions by offsetting fossil fuel generation to improving grid resilience—and they should be studied and quantified. It may not be possible to fully quantify those benefits until there is more clarity on the role customer-sited generation will play in meeting the carbon reduction goals of House Bill 951. The Commission has previously acknowledged the importance of these benefits.<sup>10</sup>

In addition to the AGO and NC WARN *et al.*, multiple other intervenors rejected the notion that the Companies have conducted an “investigation of the costs and benefits of customer-sited generation,”<sup>11</sup> including:

- 350 Triangle, 350 Charlotte, and the North Carolina Alliance to Protect Our People and the Places We Live (“350 Triangle *et al.*”);<sup>12</sup>

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<sup>8</sup> AGO’s Initial Comments, p. 1 (emphasis added).

<sup>9</sup> NC WARN *et al.*’s Initial Comments, pp. 17-22.

<sup>10</sup> AGO’s Initial Comments, pp. 3-4 (emphasis added).

<sup>11</sup> N.C. Gen. Stat. § 62-126.4(b).

<sup>12</sup> 350 Triangle *et al.*’s Initial Comments, p. 4.

- Sundance Power Systems, Inc., Southern Energy Management, Inc., and Yes Solar Solutions (“Rooftop Solar Installers”);<sup>13</sup> and
- the Environmental Working Group (“EWG”).<sup>14</sup>

In enacting House Bill 589, the General Assembly clearly intended that a thorough and independent “investigation” be conducted. For instance, Rep. John Szoka (R-Cumberland), who was the chief author of House Bill 589, stated that “[i]t’s not up to the utility to determine whether net metering is good or bad,” and “[w]e’re not putting the fox in charge of the hen house here.”<sup>15</sup> For this reason, among others, the Rooftop Solar Installers rightly recommended that “[t]he Commission should instead conduct its own study of net metering and solicit responses from interested parties, including net metering customers.”<sup>16</sup>

NC WARN *et al.* wholeheartedly agrees with the vast majority of the other intervenors of this docket concerning the purported sufficiency of the Companies’ “investigation.” The statutorily mandated “investigation” has not been conducted. The Commission should therefore reject the proposed NEM tariffs, and as discussed in NC WARN *et al.*’s Initial Comments,<sup>17</sup> the Commission should lead a cost-benefit analysis, including a Value of Solar Study.

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<sup>13</sup> Rooftop Solar Installers’ Initial Comments, p. 1-3.

<sup>14</sup> EWG’s Initial Comments, pp. 8-11.

<sup>15</sup> Elizabeth Ouzts, *Energy News Network*, “Energy Bill could see North Carolina join national fight over net metering,” July 17, 2017, <https://energynews.us/2017/07/17/energy-bill-could-see-north-carolina-join-national-fight-over-net-metering/> (accessed on March 22, 2022).

<sup>16</sup> Rooftop Solar Installers’ Initial Comments, p. 3.

<sup>17</sup> NC WARN *et al.*’s Initial Comments, pp. 9-22.

II. The Companies' Purported Cost-Benefit Analysis Failed to Meaningfully Analyze the *Benefits* of NEM Solar and Violated the Applicable Standard of Care.

As noted, House Bill 589 requires an “investigation of the costs and benefits of customer-sited generation.”<sup>18</sup> In our Initial Comments, NC WARN *et al.* established that the Companies failed to meaningfully analyze the benefits side of the ledger.<sup>19</sup> Among other failures, the Companies failed to comply with the National Energy Screening Project’s *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources* (“NSPM-DER”), which recommends, among other things, a detailed analysis of both the customer and societal impacts of distributed energy.<sup>20</sup>

As recommended by the NSPM-DER, NCSEA *et al.*’s own expert in this proceeding, R. Thomas Beach (“Mr. Beach”), previously conducted a cost-benefit analysis concerning solar generation in North Carolina, in which Mr. Beach examined factors such as “Avoided Emissions,” environmental issues, and other societal benefits of solar generation.<sup>21</sup> In the present docket, EWG similarly recommended compliance with the NSPM-DER.<sup>22</sup>

In violation of the applicable standard of care, namely the NSPM-DER, the Companies have failed to analyze these benefits of solar. In addition to NC WARN

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<sup>18</sup> N.C. Gen. Stat. § 62-126.4(b) (emphasis added).

<sup>19</sup> NC WARN *et al.*’s Initial Comments, pp. 14-22.

<sup>20</sup> *Id.* at 12-13.

<sup>21</sup> *Id.* at 13; see also R. Thomas Beach & Patrick G. McGuire, *The Benefits and Costs of Solar Generation for Electric Ratepayers in North Carolina*, October 18, 2013, at [https://energync.org/wp-content/uploads/2017/03/Benefits\\_Costs\\_Solar\\_Generation-for\\_Electric\\_Ratepayers\\_NC.pdf](https://energync.org/wp-content/uploads/2017/03/Benefits_Costs_Solar_Generation-for_Electric_Ratepayers_NC.pdf) (accessed on March 22, 2022).

<sup>22</sup> EWG’s Initial Comments, p. 15.

*et al.*, several other intervenors acknowledged this failure by the Companies. For instance, the AGO's Initial Comments correctly stated that "the Comprehensive Rate Design Study investigated the costs of customer-sited generation," but "did not analyze potential benefits of customer-sited generation."<sup>23</sup> Similarly, EWG's subject matter expert, Karl Rábago, concluded that "the Companies' proposal does not align with national best practice guidelines in several important ways," including because the Companies' proposal:

1) fails to treat customer-sited generation as a utility system resource; 2) fails to account for alignment of the proposal, which predates HB 951, to Carbon Plan emission reduction goals; 3) fails to ensure symmetry by prioritizing utility profits over a competitive market for DG; 4) fails to account for the full range of utility impacts from DG; 5) fails to align with the 25+ years of benefit that customer-sited generation can produce; 6) fails to prove that the proposal avoids double counting of impacts; 7) fails to ensure transparency; and 8) fails to conduct the benefit cost analysis separately from rate impact analysis.<sup>24</sup>

Seemingly, the only intervenor to support the fulsomeness of the Companies' cost-benefit analysis was the Public Staff.<sup>25</sup> In its Initial Comments, the Public Staff stated: "the [Companies'] studies included with this filing and reviewed by the Public Staff capture the bulk of the known and verifiable benefits."<sup>26</sup> This about-face is curious, given that the Public Staff, during the discovery phase of this docket, served data requests upon the Companies which

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<sup>23</sup> AGO's Initial Comments, p. 3.

<sup>24</sup> EWG's Initial Comments, p. 15-16; see *also* EWG's Initial Comments, Attachment A, pp. 26-27.

<sup>25</sup> The Public Staff's Initial Comments, pp. 30-31.

<sup>26</sup> *Id.* at 31.

admitted that the value of solar was not adequately analyzed. For instance, the Public Staff propounded the following data request upon the Companies: “Please explain why the Companies declined to perform a Value of Solar Study to assist in developing the proposed Rider RSC.”<sup>27</sup>

In any event, the Public Staff is incorrect that the Companies adequately analyzed the benefits of solar. In fact, as described below, the Companies have ignored many of the known and verifiable benefits of NEM, and the Companies under-value benefits that they did quantify.

Following an analysis, Mr. Powers prepared the Table 2 appearing below, which summarizes the deficiencies with the Companies’ purported cost-benefit analysis and the Public Staff’s Initial Comments. According to Mr. Powers,

The following Table 2 compares (1) the scope of the elements in a VOSS as identified by the Public Staff and the Public Staff’s appraisal of Duke Energy’s adherence to those elements, (2) NC WARN *et al.*’s assessment of the completeness and accuracy of Duke Energy’s treatment of those VOSS line items, (3) the VOSS elements – and the magnitude of those elements – in the 2013 North Carolina NEM cost-benefit assessment conducted by NCSEA *et al.*’s expert, Tom Beach of Crossborder Energy, and (4) the VOSS elements included in the National Standard Practice Manual for cost-benefit analysis of NEM.<sup>28</sup>

Table 2 from Mr. Powers’ Reply Report<sup>29</sup> appears on the following page. Mr. Powers’ Reply Report should be referenced for supporting citations, as well as additional explanations for certain portions of Table 2:

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<sup>27</sup> **Attachment D**, the Companies’ Response to the Public Staff’s Data Request No. 1-28.

<sup>28</sup> **Attachment A**, Powers’ Reply Report, p. 5.

<sup>29</sup> Table 2 appears on page 6 of Mr. Powers’ Reply Report (**Attachment A**).

**Table 2. Universe of NEM Benefits and Those Included in Duke Energy's NEM Cost-Shift Analysis**

Universe of DER Benefits Listed in PS Initial Comments (citing to 2015 SC report)	PS Initial Comments on Whether DER Benefit Is Included in Duke's NEM Cost-Shift Calculation	NC WARN Assessment Whether DER Benefit Included in Duke's NEM Cost-Shift Calculation	DER Benefits Included in Crossborder Energy NC Study, 2013 (cited in 2015 SC report)	National Standard Practice Manual for Cost-Benefit Analysis of DERs, 2020 (Tables S3, S4, S5)
Avoided Energy	Yes	Yes (fuel cost and O&M only)	Yes	Yes
Avoided Fuel Hedge	Yes – in avoided energy	No (NCSEA comments, Ex. A, p. 6)	Yes	Yes
Avoided Capacity	Yes – under proposed NEEC	Yes – but very low (one-tenth the value estimated by Crossborder in 2013, p. 3)	Yes	Yes
Avoided Losses	Yes – in avoided energy and capacity	Yes – but low (see Crossborder 2013, p. 5)	Yes	Yes
Avoided or Deferred T&D	Yes/No	Yes/No	Yes	Yes
Avoided Ancillary Services	No	No	Yes	Yes
Market Price Reduction	No	No	Yes	Yes
Avoided Renewables Procurement	No	No	Yes	Yes
Monetized Environmental	Yes – in avoided energy (NO <sub>x</sub> and SO <sub>2</sub> only)	Yes (see Crossborder 2013, p. 5)	Yes	Yes
Avoided CO <sub>2</sub> Emissions	No	No	Yes	Yes
Social Environmental	No	No	No	Yes
Security Enhance / Risk	No	No	Yes	Yes
Societal (economic/jobs)	No	No	Yes	Yes

The immediately preceding Table 2 clearly demonstrates that there are numerous material omissions from the Companies' analysis of the benefits of solar. As stated by Mr. Powers, "Duke Energy failed to conduct the cost-benefit analysis required by the applicable standard of care. In particular, Duke Energy did not analyze the full *value* of solar."<sup>30</sup>

The Public Staff and the Companies may object that some of the benefits identified in Table 2 (*i.e.*, the benefits that are missing from the Companies' analysis) are "societal" benefits. Notably, many of the benefits which the Companies failed to analyze are decidedly **not** "societal" benefits. But in any event, consideration of these societal benefits is recommended by the applicable standard of care established in the NSPM-DER.<sup>31</sup> Further, Governor Cooper's Executive Order No. 246 recommended that the Commission consider many of these social benefits:

Non-Cabinet agencies, **the North Carolina Utilities Commission** and other boards and commissions, universities, local governments, businesses, and other entities in North Carolina are **encouraged to incorporate the SC-GHG [*i.e.*, federal social cost of greenhouse gas emissions] into their decision-making processes.**<sup>32</sup>

Additionally, the Public Utilities Act expressly declares that it is "the policy of the State of North Carolina . . . [t]o encourage and promote harmony between public

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<sup>30</sup> **Attachment A**, Powers' Reply Report, p. 5 (emphasis in original).

<sup>31</sup> NC WARN *et al.*'s Initial Comments, pp. 12-13.

<sup>32</sup> *Executive Order No. 246*, January 7, 2022, p. 3, at <https://governor.nc.gov/media/2907/open> (accessed on May 6, 2022) (emphasis added).



utilities, their users and the environment.”<sup>33</sup> Any suggestion that these social benefits should be ignored is inconsistent with the applicable standard of care and North Carolina public policy.

The Public Staff’s flawed conclusions about the completeness of the Companies’ cost-benefit analysis are largely driven by the Public Staff’s misguided reliance upon an analysis prepared for the Public Service Commission of South Carolina (“PSCSC”) by Energy, Environmental Economics, Inc. (“E3”) in December 2015 (the “2015 E3 Analysis”).<sup>34</sup> Nationwide, E3 consistently undervalues NEM solar.<sup>35</sup> For instance, the 2015 E3 Analysis contains a summary of the NEM benefits quantified in twenty (20) Value of Solar Studies. “Of the six VOSSs . . . showing NEM benefits at or below 75 percent of average residential rates, E3 authored three of them[,]” and the “other three studies . . . were done by the utilities themselves.”<sup>36</sup>

One outlier from E3 is a study it conducted in 2014 for the Nevada Public Utilities Commission, where E3 showed a modest cost-shift from non-NEM customers to NEM customers.<sup>37</sup> E3 eventually recanted this 2014 study.<sup>38</sup> However, E3 recantation suffered from two (2) obvious and objective flaws. According to Mr. Powers’ Reply Report:

E3 gave two flawed reasons for the course reversal between 2014 and 2016: 1) lower natural gas (NG) prices reduced energy costs 50 percent, and 2) utility-

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<sup>33</sup> N.C. Gen. Stat. § 62-2(a)(5) (emphasis added).

<sup>34</sup> The Public Staff’s Initial Comments, p. 30, footnote 40.

<sup>35</sup> **Attachment A**, Powers’ Reply Report, p. 5.

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

scale solar prices dropped by about two-thirds, from \$100/MWh to \$36/MWh. The NG price did drop between 2014 and 2016. However, the annual average NG price in 2021 was about the same as in 2014. The critical NG variable is the long-term NG price trend, not the short-term year-to-year trend. There was no change in the 20-year levelized cost of NG between 2014 and 2016. Utility-scale solar PPA pricing did decline between 2014 and 2016, by about \$20/MWh, not \$64/MWh. E3 misapplied (NG pricing) and misstated (utility-scale solar pricing) to invert its 2014 finding that NEM was a net benefit for non-NEM customers.<sup>39</sup>

Accordingly, the Public Staff's incorrect conclusions about the completeness of the Companies' cost-benefit analysis is the result of the Public Staff's ill-advised citation to a completely unreliable source.

Other than the Public Staff, there is widespread agreement that the Companies failed to analyze the **benefits** of NEM solar. Therefore, the Commission should reject the proposed NEM tariffs because the Companies failed to comply with the mandate of House Bill 589 that an "investigation of the costs and **benefits** of customer-sited generation"<sup>40</sup> be conducted.

**III. Had the Companies Properly Analyzed the Benefits of Solar, the Companies Would Have Concluded that NEM Solar Is a Net Benefit.**

NC WARN *et al.*'s Initial comments discussed the numerous flaws in the Companies' cost-shift analysis.<sup>41</sup> By way of example, the Companies' analysis emphasized residential NEM customers to the exclusion of an examination of the

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<sup>39</sup> *Id.* at 5, 7 (internal citations omitted).

<sup>40</sup> N.C. Gen. Stat. § 62-126.4(b) (emphasis added).

<sup>41</sup> NC WARN *et al.*'s Initial Comments, pp. 27-32.

cost-shifts caused by other customer classes.<sup>42</sup> According to Mr. Powers, “had the Companies meaningfully analyzed the cost-shift between all NEM and all non-NEM customers—as opposed to just residential customers—the results would likely have revealed that the true cost-shift is in favor of non-NEM customers.”<sup>43</sup> Additionally, the Companies’ analysis failed to consider that the installation of NEM solar can reduce or eliminate expansion of the transmission and distribution (‘T&D’) system that would otherwise be necessary to accommodate load growth and grid congestion at times of peak demand.”<sup>44</sup> When these corrections are made, it becomes obvious that there is no negative cost-shift from NEM solar.<sup>45</sup>

In their initial comments, other intervenors identified yet further omissions from the Companies’ cost-shift analysis. In fact, NCSEA *et al.* correctly identified that “there are several benefits of distributed renewable generation that DEC and DEP have not quantified,” including “avoided costs for carbon emissions and fuel hedging benefits, which combined could add approximately 4 to 5 cents per kWh to the benefits.”<sup>46</sup>

In his Reply Report, Mr. Powers analyzed the effect of including this “4 to 5 cents per kWh” addition to the benefits of existing residential NEM.<sup>47</sup> According to Mr. Powers, “[a]ssuming for the sake of argument that Duke Energy accurately quantifies the limited number of NEM benefits it considers, existing NEM would

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<sup>42</sup> *Id.* at 28-29.

<sup>43</sup> *Id.* at 29.

<sup>44</sup> *Id.*; see also NC WARN *et al.*’s Initial Comments, Attachment A, p. 8.

<sup>45</sup> NC WARN *et al.*’s Initial Comments, pp. 27-32.

<sup>46</sup> NCSEA *et al.*’s Initial Comments, Exhibit A, p. 6, footnote 7.

<sup>47</sup> **Attachment A**, Powers’ Reply Report, pp. 1-2.

become decisively cost beneficial to non-NEM residential customers in DEC territory when carbon reduction and fuel hedging benefits are included, and nearly cost neutral to non-NEM residential customers in DEP territory.”<sup>48</sup> Table 1 below, which is cut-and-pasted from Mr. Powers’ Reply Report,<sup>49</sup> summarizes this analysis:

**Table 1. Effect of Including the Carbon and Fuel Hedging Benefits of Existing NEM on the Cost-Shift Alleged by Duke Energy**

Element	DEC		DEP-RES
	RS (58% of residential)	RE (42% of residential)	
NEM solar production, kWh/month	886	1,072	971
Alleged cost-shift with existing NEM, \$/month	31	30	59
Value per month of \$0.04- 0.05/kWh NEM benefit	(35-44)	(43-54)	(39-49)
Net cost shift of existing NEM tariff with carbon and fuel hedging benefits of NEM included, \$/month	(4-13)	(13-24)	10-20

Interestingly, NCSEA *et al.*’s citation supporting the “4 to 5 cents per kWh” omission is to the October 29, 2020 rebuttal testimony offered by Mr. Beach in a NEM docket which was previously pending before the PSCSC.<sup>50</sup> Mr. Beach

<sup>48</sup> *Id.* at 1.

<sup>49</sup> Table 1 appears on page 2 of Mr. Powers’ Reply Report (**Attachment A** hereto). Please consult page 2 of Mr. Powers’ Reply Report for citations supporting Table 1.

<sup>50</sup> *Rebuttal Testimony of R. Thomas Beach for the South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Vote Solar, the Solar Energy Industries Association, and the North Carolina Sustainable*

concluded “in the DESC proceeding that the economic benefit of NEM solar is more than double the cost, \$0.32/kWh versus \$0.12/kWh, when societal benefits are included in the determination of the value of NEM solar.”<sup>51</sup>

Similarly, EWG noted in its Initial Comments that Mr. Beach conducted an independent Value of Solar Study in North Carolina in 2013.<sup>52</sup> In that 2013 study, Mr. Beach concluded that “even when treating lost revenues as a cost of non-utility solar generation, and only evaluating fifteen years of system operation, the benefits of solar were greater than the costs.”<sup>53</sup> Notably, NCSEA *et al.* sponsored a report by Mr. Beach in the present NEM proceeding.

In a separate proceeding, the Public Staff expressed concerns about the uncertain cost of transmission upgrades necessary to interconnect large volumes of utility-scale solar.<sup>54</sup> Inexplicably, in the present docket, the Public Staff failed to recognize that “NEM solar can substitute for utility-scale solar and eliminate the transmission upgrade cost associated with utility-scale solar.”<sup>55</sup>

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*Energy Association*, PSCSC Docket No. 2019-182-E (October 29, 2020), pp. 13-16.

<sup>51</sup> **Attachment A**, Powers’ Reply Report, p. 2; see also PSCSC, Docket No. 2019-182-E, *Rebuttal Testimony of R. Thomas Beach*, October 29, 2020, Table 11, p. 22.

<sup>52</sup> EWG’s Initial Comments, pp. 10-11.

<sup>53</sup> *Id.* (citing R.T. Beach & P.G. McGuire, *The Benefits and Costs of Solar Generation for Electric Ratepayers in North Carolina*, Crossborder Energy (Oct. 18, 2013)).

<sup>54</sup> NCUC, 2022 Solar Procurement Proposal, Docket No. E-2, Sub 1297 and Docket No. E-7, Sub 1268, Initial Comments of the Public Staff, March 28, 2022, p. 4.

<sup>55</sup> **Attachment A**, Powers’ Reply Report, pp. 8.

According to Mr. Powers, “[t]his NEM benefit is not captured in Duke Energy’s cost-shift calculation.”<sup>56</sup> In his Reply Report, Mr. Powers analyzed this benefit of NEM solar and reached the following conclusion: “This transmission savings is substantially greater than the residential NEM cost-shift of \$360 per year (RE) and \$372 per year (RS) alleged by DEC.”<sup>57</sup>

It is completely inconsistent for the Public Staff to accept the Companies’ cost-shift analysis in the present docket, yet express concerns about the uncertain nature of the cost of transmission upgrades to facilitate utility-scale solar in a separate docket.<sup>58</sup> As noted, these are “costs that would be avoided by NEM solar and should be credited to NEM solar.”<sup>59</sup>

As described above, the initial comments in the above-captioned docket have revealed numerous material omissions from the Companies’ analysis of the benefits of solar. When appropriate corrections are made, the Companies’ concerns about a cost-shift are debunked. In fact, NEM solar is a net benefit.

**IV. There Is Widespread Agreement Among the Intervenors, and Even the Companies, that the Proposed NEM Tariffs Will Reduce the Economic Value of Rooftop Solar Systems.**

As discussed in NC WARN *et al.*’s Initial Comments, the Companies’ proposed NEM tariffs will drastically reduce the economic value of rooftop solar systems. According to Mr. Powers, the Companies’ own data shows:

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<sup>56</sup> *Id.*

<sup>57</sup> *Id.* at 8-9.

<sup>58</sup> *Id.* at 10.

<sup>59</sup> *Id.*

- “This reduction in savings amounts to twenty-nine percent (29%) for DEC NEM customers under the RS tariff”,<sup>60</sup>
- There would be “a 31 percent decline in NEM savings for DEC’s NEM customers under the RE tariff”,<sup>61</sup> and
- “This reduction in savings amounts to thirty percent (30%) for DEP’s NEM customers.”<sup>62</sup>

As noted, Mr. Powers drew these conclusions directly from the Companies’ own responses to data requests.<sup>63</sup>

In their initial comments, numerous other intervenors reached similar conclusions concerning the negative impact of the proposed NEM tariffs on the economic value of rooftop solar systems. For instance, the Public Staff concluded that the average monthly bill for NEM customers could increase by as much as 118.53%:

Based on the data provided by the Companies, the Public Staff analyzed the impacts of the proposed NEM Tariffs on quartiles of residential customers. The customer data was separated based on solar generation in kWh as a percent of load in kWh. The top quartile of customers on average generates 102.84% of their electricity needs, leading to a current average bill of \$26.38. **Under the proposal, their bill would on average increase to \$57.65.** On the other end of the spectrum, the bottom quartile of customers only generates 50.3% of their electricity needs, leading to an average monthly bill of \$100.77. **Under the proposal, their average bill would increase to \$117.49. The first quartile percent change in bill**

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<sup>60</sup> NC WARN *et al.*’s Initial Comments, p. 23.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.* at 22-23; *see also* NC WARN *et al.*’s Initial Comments, Attachment A, pp.10-11.

**would be 118.53% while the last quartile would increase by 16.59%.**<sup>64</sup>

These value reductions identified by the Public Staff are extremely significant. For instance, the average monthly bill increase of 118.53% for the first quartile equates to an approximate fifty-eight percent (58%) reduction in value of the system.

The Rooftop Solar Installers reached similar conclusions. In their Initial comments, the Rooftop Solar Installers noted that they “downloaded data from 30 existing Duke customers with solar systems installed for over a year and analyzed their data under Duke’s proposed NEM rate structures.”<sup>65</sup> Following an analysis of this data, the Rooftop Solar Installers “found a reduction in value to the customers of 20% - 35% over the life of the solar system.”<sup>66</sup>

Intervenor Donald E. Oulman (“Mr. Oulman”),<sup>67</sup> a Chemical Engineer with over fifty (50) years analyzing data and a DEC NEM customer, likewise concluded that the proposed NEM tariffs “would result in a 100% increase in my cost of electricity for the one-year period” that he evaluated.<sup>68</sup>

Even NCSEA *et al.*’s Initial Comments admitted that the proposed NEM tariffs would reduce the economic value of rooftop solar systems. According to NCSEA *et al.* and its consultant, Mr. Beach, “without this [Smart Saver Solar] incentive, bill savings for a typical solar customer with an EV would drop by about

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<sup>64</sup> The Public Staff’s Initial Comments, p. 31-32 (emphasis added).

<sup>65</sup> Rooftop Solar Installers’ Initial Comments, p. 3.

<sup>66</sup> *Id.*

<sup>67</sup> Mr. Oulman filed a Petition to Intervene in the above-referenced docket on March 28, 2022. Upon information and belief, the Commission has not ruled upon that petition. However, Mr. Oulman is listed as a “Party of Record” on the “Service List” tab of the online docket.

<sup>68</sup> Oulman’s Initial Comments, p. 2.



15%, and would drop further for customers who do not adjust to the new TOU periods.”<sup>69</sup> With neither the Smart Saver Solar incentive nor EV, NCSEA *et al.*’s analysis predicts a decline in NEM value of twenty-four percent (24%).<sup>70</sup> These predictions are especially concerning because a very significant number of DEC residential customers are on the RS tariff and are therefore ineligible for the Smart Saver Solar incentive.<sup>71</sup>

This disincentivization of rooftop solar violates the public policy of North Carolina and should therefore be given great weight by the Commission. For example, in Executive Order No. 80, Governor Cooper directed the development of a state Clean Energy Plan.<sup>72</sup> The resulting Clean Energy Plan sets goals to reduce electric utilities’ greenhouse gas emissions by seventy percent (70%) below 2005 levels by 2030 and achieve carbon neutrality by 2050.<sup>73</sup> Relatedly, in Executive Order 246, Governor Cooper encouraged the Commission to incorporate certain social costs of greenhouse gas emissions into its decision-making processes.<sup>74</sup> Disincentivizing the installation of rooftop solar, as the

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<sup>69</sup> NCSEA *et al.*’s Initial Comments, p. 9.

<sup>70</sup> NCSEA *et al.*’s Initial Comments, Attachment A, Table 2, p. 10; see *also* **Attachment A**, Powers’ Reply Report, p. 3, footnote 17.

<sup>71</sup> **Attachment A**, Powers’ Reply Report, p. 3.

<sup>72</sup> *Executive Order No. 80*, October 29, 2018, at <https://files.nc.gov/governor/documents/files/EO80-%20NC%27s%20Commitment%20to%20Address%20Climate%20Change%20%26%20Transition%20to%20a%20Clean%20Energy%20Economy.pdf> (accessed on March 22, 2022).

<sup>73</sup> *North Carolina Clean Energy Plan*, October 2019, at [https://files.nc.gov/ncdeq/climate-change/clean-energy-plan/NC\\_Clean\\_Energy\\_Plan\\_OCT\\_2019.pdf](https://files.nc.gov/ncdeq/climate-change/clean-energy-plan/NC_Clean_Energy_Plan_OCT_2019.pdf) (accessed on March 22, 2022).

<sup>74</sup> *Executive Order No. 246*, January 7, 2022, at <https://governor.nc.gov/media/2907/open> (accessed on May 6, 2022).

Companies propose to do, is completely inapposite with Executive Order Nos. 80 and 246, as well as the Clean Energy Plan.

Moreover, House Bill 951 was signed into law by Governor Cooper on October 13, 2021. Among other things, House Bill 951 “requires implementation of a carbon emissions reduction plan for the State’s public utilities,”<sup>75</sup> including the Companies. Again, the Companies’ discouragement of rooftop solar undermines this goal of reducing carbon emissions.

**V. The Companies’ Proposed NEM Tariffs Are Too Complicated.**

The initial comments of several intervenors make the valid point that the Companies’ proposed NEM tariffs are too vague and complex, which will make it impossible for customers to project their savings (if any) from rooftop solar. The complexities of the proposed NEM tariffs were convincingly summed up by NCSEA *et al.* as follows:

Most important, the package of NEM reforms is complex, requiring customers to understand a new, complicated TOU/CPP rate design with a minimum bill and non-bypassable charges, and to participate in the Winter BYOT program. This structure is far more complex than traditional NEM, whose key strength always has been the mechanism’s easy understandability for prospective solar customers – i.e. “running the meter backward.”<sup>76</sup>

The Rooftop Solar Installers’ Initial Comments provided even more detail concerning the complexities of the proposed NEM tariffs: “Under the current net metering system, the NCRSI companies [*i.e.*, the Rooftop Solar Installers] need 24

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<sup>75</sup> The Companies’ Joint Application, p. 7.

<sup>76</sup> NCSEA *et al.*’s Initial Comments, Exhibit A, pp. 6-7.

energy data points to model solar effectively (12 months of energy usage data and 12 months of projected solar production).<sup>77</sup> However, under the Companies' proposed NEM tariffs, "those 24 data points would increase to 17,520; with hourly data required for both solar (8,760 hours) and usage data (another 8,760 hours). And this does not include factoring in Critical Peak Pricing rates, which are unknowable. This adds magnitudes of complication to the design process while adding no value for solar system owners."<sup>78</sup> Accordingly, the Rooftop Solar Installers concluded that "the complexity and vagueness of the proposed NEM Tariffs will make it so difficult to estimate solar benefits that actual benefits will fall outside the range of projections" and "will result in an erosion of confidence in our industry and a loss of credibility."<sup>79</sup>

NC WARN *et al.* fully endorses this argument by the Rooftop Solar Installers, and we urge the Commission to consider the chilling effect that these complex and vague proposed NEM tariffs will have upon the solar industry.

#### **VI. The Proposed NEM Tariffs Treat Legacy Customers Unfairly.**

NC WARN *et al.* also urges the Commission to seriously consider the arguments of intervenor Mr. Oulman<sup>80</sup> concerning the impact of the proposed NEM tariffs upon legacy customers. Under the Joint Application, at least some elements of the proposed NEM tariffs would apply to legacy customers such as Mr. Oulman

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<sup>77</sup> Rooftop Solar Installers' Initial Comments, p. 5.

<sup>78</sup> *Id.* at 5-6.

<sup>79</sup> *Id.* at 7.

<sup>80</sup> As noted above, Mr. Oulman filed a Petition to Intervene in the above-referenced docket on March 28, 2022. Upon information and belief, the Commission has not ruled upon that petition.

as of January 1, 2027. The drastic changes to the current NEM tariffs proposed by the Companies will significantly impair the value proposition under which these legacy customers made the decision to invest in rooftop solar. For instance, a customer who installs rooftop solar in December 2022 will have that value proposition changed just 5 years into the 25+-year life of the investment.<sup>81</sup> This unfair treatment of legacy customers justifies rejecting the proposed NEM tariffs.

**VII. The Proposed NEM Tariffs Violate the Provisions of PURPA.**

In its Initial Comments, the “Public Staff recommend[ed] that the Commission find that NEM generation facilities . . . are considered Qualifying Facilities under PURPA for purposes of fuel cost recovery.”<sup>82, 83</sup> As an initial matter, it is unnecessary for the Commission to make this determination because Qualifying Facility (“QF”) status automatically applies under the Public Utility Regulatory Policies Act (“PURPA”)<sup>84</sup> to any on-site solar generator up to 1 MW.<sup>85</sup>

That said, the Public Staff’s reference to PURPA requires some discussion. Charges upon solar QFs violate PURPA if the charge is not “just and reasonable and in the public interest” and if the charge “discriminate[s] against any qualifying facility in comparison to the rates for sales to other customers served by the electric

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<sup>81</sup> Oulman’s Initial Comments, p. 5.

<sup>82</sup> The Public Staff’s Initial Comments, p. 39.

<sup>83</sup> The Public Staff seemingly makes this argument in support of its flawed recommendation that the Net Energy Export Credit be charged at avoided cost. This argument should be rejected. NC WARN *et al.* has reviewed EWG’s Reply Comments, including the accompanying report of Karl Rábago, in advance of filing. EWG’s said Reply Comments address and reject this argument of the Public Staff’s, and NC WARN *et al.* adopts and incorporates EWG’s said argument herein.

<sup>84</sup> 16 U.S.C § 824a-3.

<sup>85</sup> 18 C.F.R. § 292.203(d).

utility.”<sup>86</sup> The Federal Energy Regulatory Commission (“FERC”) has determined that a QF “should be charged at a rate applicable to a non-generating [customer of the same customer class] unless the electric utility shows that a different rate is justified on the basis of sufficient load or other cost-related data.”<sup>87</sup>

Significantly, FERC has ruled that QFs are “likely to have the same characteristics as the load of other nongenerating customers of the utility,” and therefore, these QFs should be subject to the same rates as non-QFs”<sup>88</sup> FERC has set the following criteria for this analysis: to charge a different rate to a QF, the rate must (a) be “based on accurate data,” (2) be established using “consistent system wide costing principles,” and (3) “apply to the utility’s other customers with similar load or other cost-related characteristics.”<sup>89</sup> If these rules are violated, PURPA allows interested persons to petition FERC and then the U.S. District Court for redress of NEM charges which violate PURPA.<sup>90</sup>

The Companies have failed to satisfy these PURPA rules. For instance, in its Initial Comments, EWG correctly argued that the proposed NEM tariffs discriminate against several customer categories, including residential customers and solar customers.<sup>91</sup> NC WARN *et al.* agrees with EWG’s said arguments. As described above, this discrimination would violate PURPA. In addition to the

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<sup>86</sup> *Id.* § 292.305(a)(1).

<sup>87</sup> Joint Explanatory of the Committee of the Conference, P.L. 78-617, reprinted in *FERC Statutes and Regulations* ¶ 5151, p. 5105-06; 45 Fed. Reg. 12,214, 12,228 (Feb. 25, 1980) (“FERC Order No. 69”).

<sup>88</sup> FERC Order No. 69.

<sup>89</sup> 18 C.F.R. § 292.305(a)(2).

<sup>90</sup> 16 U.S.C. § 824a-3(h)(2)(B).

<sup>91</sup> *E.g.*, EWG’s Initial Comments, pp. 5-7.

discrimination issue, the Companies propose, and the Public Staff seemingly supports, the imposition of charges based upon average values taken from the Companies' cost studies—not specific costs created by actual facilities. Again, this proposal violates the above-quoted requirements of PURPA.

Therefore, the provisions of PURPA provide yet more basis for the Commission to reject the Companies' proposed NEM tariffs.

**VIII. Adoption of the Initial Comments and Reply Comments of EWG.**

NC WARN *et al.* incorporates by reference and adopts the arguments contained within EWG's Initial Comments. Furthermore, NC WARN *et al.* has reviewed EWG's Reply Comments, including the accompanying report of Karl Rábago, and NC WARN *et al.* incorporates by reference and adopts the arguments contained therein.

**CONCLUSION**

The Companies' proposed NEM tariffs violate House Bill 589 and are unsupported by the evidence. For the reasons discussed herein, as well as within NC WARN *et al.*'s Initial Comments, the Commission should reject the Companies' Joint Application. As required by House Bill 589, the Commission should lead a cost-benefit analysis of solar generation, which would include a Commission-led Value of Solar Study. Only upon the conclusion of these studies should new NEM tariffs be proposed by the Companies.

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This the 12th day of May, 2022.

/s/ Matthew D. Quinn  
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*Attorney for NC WARN, NCCSC &  
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CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document upon all counsel of record by email transmission.

This the 12th day of May, 2022.

/s/ Matthew D. Quinn

Matthew D. Quinn

*Attorney for NC WARN, NCCSC &  
Sunrise Durham*



# Attachment A

Report Responding to the Initial Comments of the Public Staff  
and NCSEA *Et. Al.*, by Mr. Powers

**Report Responding to the Initial Comments of the Public Staff and NCSEA *et al.***

**NCUC Docket No. E-100, Sub 180**

May 12, 2022, Bill Powers, P.E.

On behalf of NC WARN, North Carolina Climate Solutions Coalition (“NCCSC”), and Sunrise Movement Durham Hub (“Sunrise Durham”), I hereby submit the following Report Responding to the Initial Comments of the Public Staff and NCSEA *et al.*:

**I. REPLY TO NCSEA *ET AL.*’S INITIAL COMMENTS (Including the Crossborder Report on NEM)**

***A. Full accounting of NEM benefits validates the existing residential NEM tariff as beneficial to all customers.***

NCSEA, SACE and Vote Solar (collectively, “NCSEA *et al.*”)<sup>1</sup> assert that a monthly minimum bill of \$22 per month for Duke Energy Carolinas, LLC (“DEC”) and \$28 per month for Duke Energy Progress, LLC (“DEP”) is necessary “*to ensure that new solar customers contribute fairly to the recovery of utility costs that do not vary with usage.*”<sup>2</sup> Yet at the same time, NCSEA *et al.* acknowledges that DEC and DEP (collectively, “Duke Energy”) has not quantified all of the benefits provided by NEM. NCSEA *et al.* states that “*These RIM (Ratepayer Impact Measure) test scores are low, because there are several benefits of distributed renewable generation that DEC and DEP have not quantified. These include avoided costs for carbon emissions and fuel hedging benefits, which combined could add approximately 4 to 5 cents per kWh to the benefits.*”<sup>3</sup>

The effect of including these 4 to 5 cents per kWh to the benefits of existing residential NEM is shown in Table 1 below. Assuming for the sake of argument that Duke Energy accurately quantifies the limited number of NEM benefits it considers, existing NEM would become decisively cost beneficial to non-NEM residential customers in DEC territory when carbon reduction and fuel hedging benefits are included,<sup>4,5</sup> and nearly cost neutral to non-NEM residential customers in DEP territory.

<sup>1</sup> NCUC Docket No. E-100, Sub 180, *Joint Initial Comments of the North Carolina Sustainable Energy Association, Southern Alliance for Clean Energy, and Vote Solar*, March 29, 2022.

<sup>2</sup> *Ibid*, p. 8.

<sup>3</sup> *Ibid*, Exhibit A, p. 6, footnote 7.

<sup>4</sup> The 2020 DEC and DEP IRPs both include sections on CO<sub>2</sub> pricing (NCUC Docket No. E-100, Sub 165, DEC IRP p. 154, DEP IRP p. 154). The upper-end, 2035 CO<sub>2</sub> pricing examined by Duke Energy, used as a proxy in this Report for the 25-year levelized CO<sub>2</sub> benefit, is about \$120/ton. This would equal a NEM CO<sub>2</sub> benefit of about \$21/MWh (\$0.021/kWh) in 2035, when Duke Energy projects a carbon footprint of 350 lb/MWh (NCUC Docket No. E-100, Sub 165, DEC IRP, pp. 9-10, DEP IRP, pp. 9-10). (350 lb CO<sub>2</sub>/MWh) x (1 ton/2,000 lb) x \$120/ton CO<sub>2</sub> = \$21/MWh.

<sup>5</sup> Tom Beach of Crossborder Energy, testifying on behalf of NCSEA in the South Carolina generic NEM proceeding before the Public Service Commission of South Carolina (“PSCSC”) in October 2020, calculated a NEM fuel hedging benefit of \$0.033/kWh. See PSCSC Docket No. 2019-182-E, *R. Thomas Beach Rebuttal Testimony*, October 29, 2020, p. 15: “The result is a value of \$0.033 per kWh as the 25-year levelized benefit of reducing fuel price uncertainty.”

**Table 1. Effect of Including the Carbon and Fuel Hedging Benefits of Existing NEM on the Cost-Shift Alleged by Duke Energy**

Element	DEC		DEP-RES
	RS (58% of residential) <sup>6</sup>	RE (42% of residential) <sup>7</sup>	
NEM solar production, <sup>8</sup> kWh/month	886	1,072	971
Alleged cost-shift with existing NEM, <sup>9</sup> \$/month	31	30	59
Value per month of \$0.04-0.05/kWh NEM benefit	(35-44)	(43-54)	(39-49)
Net cost shift of existing NEM tariff with carbon and fuel hedging benefits of NEM included, \$/month	(4-13)	(13-24)	10-20

The NCSEA *et al.* citation for the 4 to 5 cents per kWh of additional NEM benefits attributable to reduced carbon emissions and fuel hedging is the October 2020 reply testimony by the NCSEA *et al.* expert, Tom Beach of Crossborder Energy, in the NEM proceeding before the Public Service Commission of South Carolina (“PSCSC”).<sup>10</sup> In that testimony, Mr. Beach focuses on the cost and benefit values for residential NEM solar presented in testimony by Dominion Energy South Carolina (“DESC”).

Mr. Beach’s testimony also includes a scenario where NEM societal benefits are quantified. A complete cost-benefit study, otherwise known as a value-of-solar study (“VOSS”), would include the quantification of societal benefits.<sup>11</sup> NCSEA *et al.*’s expert determined in the DESC proceeding that the economic benefit of NEM solar is more than double the cost, \$0.32/kWh versus \$0.12/kWh,<sup>12</sup> when societal benefits are included in the determination of the value of NEM solar.

NCSEA *et al.*’s Initial Comments do not demonstrate that the proposed NEM tariff is fair. The NCSEA *et al.* comments demonstrate the opposite - that the proposed NEM tariff is unfair - by quantifying two substantive NEM benefits, carbon reduction and fuel hedging, that were ignored by Duke Energy. The NEM tariff proposed by Duke cannot be fair when substantive NEM benefits are excluded from the cost-benefit ledger. NCSEA *et al.*’s Initial Comments demonstrate the need for a comprehensive VOSS.

<sup>6</sup> **Attachment B**, Duke Energy’s Response to the Public Staff’s Data Request No. 3-3.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> **Attachment C**, Duke Energy’s Response to NC WARN’s Data Request No. 1-11.

<sup>10</sup> PSCSC, Docket No. 2019-182-E, *Rebuttal Testimony of R. Thomas Beach on Behalf of the South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Vote Solar, The Solar Energy Industries Association, and the North Carolina Sustainable Energy Association*, October 29, 2020, Figure ES-1, p. 2.

<sup>11</sup> T. Woolf, *et al.*, *National Standard Practice Manual for Benefit—Cost Analysis of Distributed Energy Resources*, National Energy Screening Project (Aug. 2020), available at <https://www.nationalenergyscreeningproject.org/national-standard-practice-manual/>.

<sup>12</sup> PSCSC, Docket No. 2019-182-E, *Rebuttal Testimony of R. Thomas Beach*, October 29, 2020, Table 11, p. 22.



***B. NCSEA et al. acknowledges that the proposed NEM incentive will only be available to some of Duke Energy's residential customers, and even with the incentive customers will have little economic reason to participate.***

Most DEC residential customers are on the RS tariff and not the all-electric (RE) tariff.<sup>13</sup> The incentive is limited to “residential customers whose energy for all water heating, clothes drying, and environmental space conditioning is supplied electrically.”<sup>14</sup> For this reason, many RS customers would not be eligible for the incentive.

NCSEA et al. acknowledges that even with the incentive, the overall score of the Participant Cost Test is marginal at 0.88 – 0.89.<sup>15</sup> In other words, the proposed tariff does not give potential NEM participants much economic motivation to participate, even the customers who receive the incentive payment. Without the incentive payment, NCSEA et al. opines correctly that the proposed tariff “will not achieve a reasonable balance between participating and non-participating ratepayers.”<sup>16</sup>

The reduction in value between the existing NEM tariff and the proposed tariff is steep. Table 2 of Attachment A to NCSEA et al.'s Initial Comments, which compares the existing NEM tariff to the proposed new NEM tariff for 9 kW solar systems, shows a decline in NEM value – without the incentive and with no EV – of 24 percent.<sup>17</sup> This is in the range of Duke's estimate of a 30 percent reduction in NEM value for systems of similar size without the incentive.<sup>18</sup>

***C. The proposed TOU rates are not “sharply differentiated” and the TOU window occurs too late in the day in summer to benefit NEM customers.***

The NCSEA et al. claim that the proposed TOU rates are sharply differentiated is inaccurate.<sup>19</sup> The summer on-peak and off-peak rates are 0.192/kWh and 0.084/kWh for DEC (RS tariff) and 0.193/kWh and 0.098/kWh for DEP.<sup>20</sup> This is a summer on-peak/off-peak differentiation of about \$0.10/kWh. The DESC NEM tariff approved by the PSCSC in May 2021 has a summer on-peak/off-peak differentiation of about \$0.20/kWh,<sup>21</sup> or about double the degree of

<sup>13</sup> **Attachment B**, Duke Energy's Response to the Public Staff's Data Request No. 3-3. The RE tariff does allow use of natural gas for cooking.

<sup>14</sup> Duke Energy Carolinas, LLC, Application for Approval of Smart Saver Solar Energy Efficiency Program Docket No. E-7, Sub 1261, December 16, 2021, p. 3.

<sup>15</sup> NCUC Docket No. G-5, Sub 632, *Direct Testimony of James Herndon* (Navigant), April 1, 2021, p. 10.

“Participant Cost Test (“PCT”) – this test is designed to measure the cost effectiveness of the program from the perspective of the customer who installs the eligible program measure . . . The results of each test are typically presented as a ratio of benefits to costs. In general, if benefits are equal to or greater than costs, resulting in a ratio of 1.0 or greater, the measure or program passes from that test perspective.”

<sup>16</sup> NCSEA et al.'s Initial Comments, Attachment A, p. 7.

<sup>17</sup> Ibid, Attachment A, Table 2, p. 10 (DEC RE, 9 kW). Legacy NEM solar bill savings = \$983/year. Solar Choice bill savings = \$744/year. Reduction in bill savings =  $(\$983/\text{year} - \$744/\text{year}) \div \$983/\text{year} = 0.243$  (24.3 percent).

<sup>18</sup> **Attachment B**, Duke Energy's Response to the Public Staff's Data Request No. 3-3. DEC RE (10 kW) current NEM bill savings = \$1,025/year. RE proposed bill savings = \$708/year. Reduction in bill savings =  $(\$1,025/\text{year} - \$708/\text{year}) \div \$1,025/\text{year} = 0.309$  (30.9 percent).

<sup>19</sup> NCSEA et al.'s Initial Comments, p. 8.

<sup>20</sup> NCWARN et al.'s Initial Comments, Attachment A, Table 1, p. 13.

<sup>21</sup> Ibid.

differentiation in the proposed DEC and DEP NEM tariffs. The DESC NEM tariff has sharply differentiated TOU rates. The proposed DEC and DEP NEM tariffs do not.

What is more, the proposed DEC and DEP summer on-peak TOU window is 6 – 9 pm, when a solar-only NEM system will produce very little power.<sup>22</sup> DEC and DEP NEM customers could add battery storage to auto-supply during the on-peak window. However, NCSEA *et al.* acknowledges that battery storage does not “pencil out” with the TOU tariffs and TOU windows in the proposed DEC and DEP NEM tariffs.<sup>23</sup> In contrast, a solar-only NEM system can take full advantage of the sharply differentiated TOU rates in the new DESC NEM tariff, with its summer on-peak period of 2 – 7 pm.<sup>24</sup>

***D. The proposed NEM tariff is poorly designed because it is designed to reward minimizing the size of NEM systems.***

NCSEA *et al.* identifies cost features of the proposed NEM tariffs that economically penalize customers who desire to offset 100 percent of their annual electricity consumption – or more – as “right-sizing,” stating that:<sup>25</sup>

The proposed Solar Choice NEM tariffs include components such as the avoided cost monthly net excess export rate and MMB that will encourage “right-sizing” of solar systems and discourage “over-building.”

The proposed NEM tariffs are designed to discourage customers from realizing the full potential of their rooftops to offset their electric load with onsite solar power. This is not “right-sizing.” It is poor tariff design that fails to maximize the contribution of residential rooftops to achieve state greenhouse gas reduction targets.”

## **II. REPLY TO THE PUBLIC STAFF’S INITIAL COMMENTS**

***A. The Public Staff is wrong to assert that Duke Energy’s assessment of the benefits of NEM solar is adequate.***

The Public Staff glosses over glaring deficiencies in Duke Energy’s assessment of the costs and benefits of NEM solar. In the table at p. 31 of the Public Staff’s Initial Comments, the Public Staff lists inputs to what it considers a comprehensive hypothetical VOSS. The Public Staff states that “the (Duke Energy) studies included with this filing and reviewed by the Public Staff capture the bulk of the known and verifiable benefits.”<sup>26</sup> This is factually incorrect, as shown in

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<sup>22</sup> Ibid, Figure 1, pp. 16-17.

<sup>23</sup> NCSEA *et al.*’s Initial Comments, Exhibit A, pp. 10-11: “The sharply-differentiated TOU-CPP rates will also provide savings for customer-generators who incorporate on-site storage to use excess solar output to reduce on-peak usage, savings that are not available to a customer-generator on a flat rate schedule. While the savings would not cover the full costs of battery storage at today’s prices . . .”

<sup>24</sup> NCWARN *et al.*’s Initial Comments, Attachment A, Table 1, p. 13.

<sup>25</sup> NCSEA *et al.*’s Initial Comments, Exhibit A, p. 11.

<sup>26</sup> Public Staff’s Initial Comments, p. 31.



Table 2 below. Duke Energy ignores many of the “known and verifiable” benefits of NEM, and under-values benefits that it does quantify.

The following Table 2 compares (1) the scope of the elements in a VOSS as identified by the Public Staff and the Public Staff’s appraisal of Duke Energy’s adherence to those elements, (2) NC WARN *et al.*’s assessment of the completeness and accuracy of Duke Energy’s treatment of those VOSS line items, (3) the VOSS elements – and the magnitude of those elements – in the 2013 North Carolina NEM cost-benefit assessment conducted by NCSEA *et al.*’s expert, Tom Beach of Crossborder Energy, and (4) the VOSS elements included in the National Standard Practice Manual for cost-benefit analysis of NEM. As Table 2 clearly demonstrates, Duke Energy failed to conduct the cost-benefit analysis required by the applicable standard of care. In particular, Duke Energy did not analyze the full *value* of solar.

In its Initial Comments, the Public Staff’s citation for the scope of the benefits included in a VOSS is the cost-shift analysis that the consulting firm Energy, Environmental Economics, Inc. (E3) prepared for the PSCSC Regulatory Staff in December 2015.<sup>27</sup> Figure 1 of these Reply Comments is the bar chart from that 2015 E3 analysis that summarizes the NEM benefits quantified in twenty VOSSs. As shown in Figure 1, E3 consistently undervalues NEM. Of the six VOSSs in Figure 1 showing NEM benefits at or below 75 percent of average residential rates, E3 authored three of them. The other three studies showing low NEM solar benefits were done by the utilities themselves (specifically Xcel, TVA, and APS).<sup>28</sup>

The one exception in Figure 1 to E3 calculating low NEM benefits in its VOSS assessments is the 2014 cost-shift study E3 did for the Nevada PUC in 2014, where E3 shows a modest cost-shift from non-NEM customers to NEM customers. However, E3 recanted its 2014 conclusions in its 2016 update to the 2014 NEM assessment.<sup>29</sup>

E3 gave two flawed reasons for the course reversal between 2014 and 2016:<sup>30</sup> 1) lower natural gas (NG) prices reduced energy costs 50 percent, and 2) utility-scale solar prices dropped by about two-thirds, from \$100/MWh to \$36/MWh. The NG price did drop between 2014 and 2016. However, the annual average NG price in 2021 was about the same as in 2014.<sup>31</sup> The critical NG variable is the long-term NG price trend, not the short-term year-to-year trend. There was no change in the 20-year levelized cost of NG between 2014 and 2016.<sup>32</sup> Utility-scale solar PPA

<sup>27</sup> Ibid, p. 30, footnote 40.

<sup>28</sup> See Figure 1.

<sup>29</sup> The E3 reversal is summarized in this August 25, 2016 ALEC article acknowledging E3’s 2016 NV Update: <https://alec.org/article/new-study-reveals-the-extent-of-rooftop-solar-cost-shift-in-nevada/>. E3’s 2016 NV Update was also amplified by The Heartland Institute in its August 31, 2016 reporting of excerpts from the executive summary: <https://www.heartland.org/publications-resources/publications/nevada-net-energy-metering-impacts-evaluation-2016-update?source=policybot>.

<sup>30</sup> E3, *Nevada Net Energy Metering Impacts Evaluation 2016 Update*, August 2016, p. 3, available at [https://puc.nv.gov/uploadedFiles/pucnv.gov/Content/About/Media\\_Outreach/Announcements/Announcements/NetMeteringStudy2016.pdf](https://puc.nv.gov/uploadedFiles/pucnv.gov/Content/About/Media_Outreach/Announcements/Announcements/NetMeteringStudy2016.pdf).

<sup>31</sup> EIA, U.S. Natural Gas Citygate Price, available at <https://www.eia.gov/dnav/ng/hist/n3050us3m.htm>.

<sup>32</sup> See the graphic on pdf p. 37 of the October 2021 NREL “Fall 2021 Solar Industry Update” for the NG and utility-scale long-term price trends: <https://www.nrel.gov/docs/fy22osti/81325.pdf>.

**Table 2. Universe of NEM Benefits and Those Included in Duke Energy's NEM Cost-Shift Analysis**

Universe of DER Benefits Listed in PS Initial Comments <sup>33</sup> (citing to 2015 SC report)	PS Initial Comments on Whether DER Benefit Is Included in Duke's NEM Cost-Shift Calculation	NC WARN Assessment Whether DER Benefit Included in Duke's NEM Cost-Shift Calculation	DER Benefits Included in Crossborder Energy NC Study, 2013 (cited in 2015 SC report)	National Standard Practice Manual for Cost-Benefit Analysis of DERs, 2020 (Tables S3, S4, S5)
Avoided Energy	Yes	Yes (fuel cost and O&M only) <sup>34</sup>	Yes	Yes
Avoided Fuel Hedge	Yes – in avoided energy	No (NCSEA comments, Ex. A, p. 6)	Yes	Yes
Avoided Capacity	Yes – under proposed NEEC	Yes – but very low (one-tenth the value estimated by Crossborder in 2013, p. 3)	Yes	Yes
Avoided Losses	Yes – in avoided energy and capacity	Yes – but low (see Crossborder 2013, p. 5)	Yes	Yes
Avoided or Deferred T&D	Yes/No <sup>35</sup>	Yes/No <sup>3</sup>	Yes	Yes
Avoided Ancillary Services	No	No	Yes	Yes
Market Price Reduction	No	No	Yes	Yes
Avoided Renewables Procurement	No	No	Yes	Yes
Monetized Environmental	Yes – in avoided energy (NOx and SO2 only)	Yes (see Crossborder 2013, p. 5)	Yes	Yes
Avoided CO <sub>2</sub> Emissions	No	No	Yes	Yes
Social Environmental	No	No	No <sup>36</sup>	Yes
Security Enhance / Risk	No	No	Yes	Yes
Societal (economic/jobs)	No	No	Yes	Yes

<sup>33</sup> Public Staff (PS) Initial Comments, March 29, 2022, p. 31, footnote 41. See *South Carolina Act 236 Cost Shift and Cost of Service Analysis*, prepared by E3, Figure 1 at 8: <https://ors.sc.gov/sites/default/files/Documents/Regulatory/electricNaturalGas/Electricity/Act%20236%20Cost%20Shifting%20Report.pdf>.

<sup>34</sup> See Duke Energy's Response to NC WARN's Data Request No. 1-11.

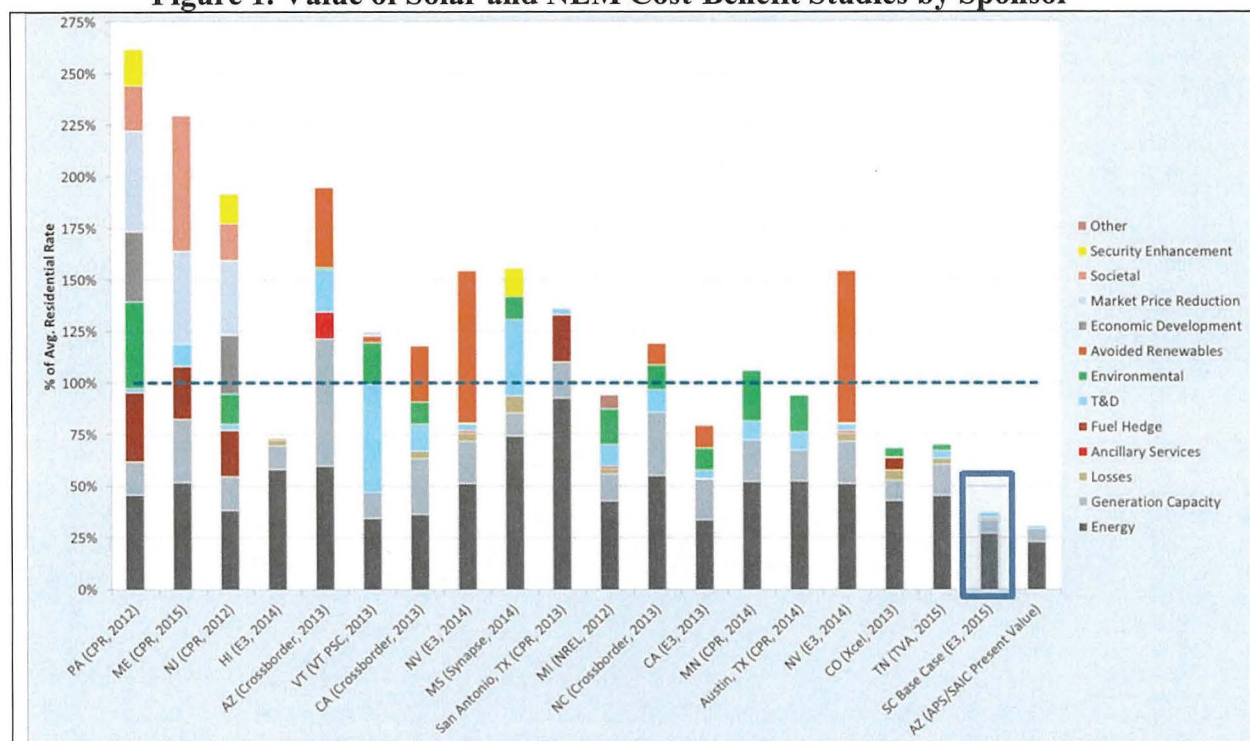
<sup>35</sup> PS, p. 31, footnote 42. "The value of avoided T&D is included in Duke's studies; however, NEM customers are not compensated for avoided T&D in the NEEC."

<sup>36</sup> However, social environmental benefits, "Societal Benefits," were quantified in the October 2020 NEM cost-benefit assessment prepared by Crossborder Energy for NCSEA et al in the Dominion Energy South Carolina (DESC) NEM proceeding. The inclusion of these societal benefits more than doubled the calculated benefits of NEM solar, from \$0.14/kWh to \$0.32/kWh. See: PSCSC, Docket No. 2019-182-E, South Carolina Energy Freedom Act: Generic Docket to (1) Investigate and Determine the Costs and Benefits of the Current Net Energy Metering Program and (2) Establish a Methodology for Calculating the Value of the Energy Produced by Customer-Generators, *Rebuttal Testimony of R. Thomas Beach on Behalf of the South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Vote Solar, The Solar Energy Industries Association, and the North Carolina Sustainable Energy Association*, October 29, 2020, Figure ES-1, p. 2 and Table 11, p. 22.



pricing did decline between 2014 and 2016, by about \$20/MWh, not \$64/MWh.<sup>37</sup> E3 misapplied (NG pricing) and misstated (utility-scale solar pricing) to invert its 2014 finding that NEM was a net benefit for non-NEM customers.

**Figure 1. Value of Solar and NEM Cost-Benefit Studies by Sponsor<sup>38,39</sup>**



Public Staff is basing its statements about the completeness of Duke Energy's assessment of the benefits of NEM solar on an analysis prepared by E3 for the South Carolina Office of Regulatory Staff. As is evident in Figure 1 and further supported by E3's 2016 NV NEM Update,<sup>40</sup> E3 consistently undervalues the benefits of NEM solar in the jurisdictions around the country where it has conducted assessments of NEM costs and benefits. E3 is not a neutral, independent source for defining the completeness of a VOSS.

What is more, the Public Staff took it upon itself to conclude, without supporting evidence, that numerous VOSS elements that are listed separately by E3 are presumptively included in the

<sup>37</sup> Ibid, p. 37.

<sup>38</sup> E3, *South Carolina Act 236 Cost Shift and Cost of Service Analysis*, prepared on behalf of the South Carolina Office of Regulatory Staff, December 18, 2015, Figure 2, p. 9.

<sup>39</sup> Ibid, p. 9, footnote 10: "Note, this chart is not meant to represent a benefit-cost test, but merely to serve as a comparison of how various potential benefits both direct (energy, generation capacity, losses, ancillary services, transmission and distribution, environmental, avoided renewables, and market price effect) and indirect (fuel hedge, societal, economic development, security enhancement, and other) have been calculated in each study. The average rates are aggregate numbers that include both fixed and variable charges, as reported by the U.S. Energy Information Administration."

<sup>40</sup> The Las Vegas Review-Journal summed-up the revised 2016 E3 cost-shift perspective in this August 2016 article: "The new E3 report is not likely to help the rooftop solar industry in its quest to restore net metering rates to the more favorable structure in place prior to this year." See: <https://www.reviewjournal.com/business/energy/rooftop-solar-shifts-36m-a-year-to-nonsolar-ratepayers-in-nevada-study-says/>.



NEM avoided energy cost projection developed by Duke Energy. However, neither the Public Staff nor Duke Energy have identified how those VOSS elements were incorporated, and I am unable to find how or where those mandatory elements were incorporated into the avoided energy cost. In sum, the Public Staff is incorrect that Duke Energy adequately analyzed the value of solar.

***B. The Public Staff correctly expresses concern about the potentially high cost of new transmission to interconnect a large amount of utility-scale solar in another proceeding without recognizing that as an omission in Duke Energy's assessment of the benefits of NEM.***

The Public Staff asserts in its Initial Comments that Duke Energy captured the avoided capacity and avoided or deferred T&D value of NEM.<sup>41</sup> Yet in a separate, parallel proceeding the Public Staff expresses concern that the uncertain cost of transmission upgrades necessary to interconnect large volumes of (utility-scale) solar may not result in least-cost compliance with HB 951's carbon reduction goals.<sup>42</sup> These transmission upgrade costs reflect project developer preference to locate these projects in transmission-limited southeastern North Carolina where land costs are low.<sup>43</sup> NEM solar can substitute for utility-scale solar and eliminate the transmission upgrade cost associated with utility-scale solar. This NEM benefit is not captured in Duke Energy's cost-shift calculation.

The transmission upgrade costs associated with specific utility-scale solar projects in DEC and DEP service territories are known.<sup>44, 45</sup> As a result, the transmission cost that would be avoided by substituting that utility-scale solar capacity with NEM solar can be calculated. For example, DEC lists three solar projects in Laurens County, SC on contiguous 100 kV circuits with a combined capacity of 115 MW and a combined transmission upgrade cost of \$40.55 million.<sup>46</sup>

<sup>41</sup> The Public Staff's Initial Comments, p. 31.

<sup>42</sup> NCUC, 2022 Solar Procurement Proposal, Docket No. E-2, Sub 1297 and Docket No. E-7, Sub 1268, Initial Comments of the Public Staff, March 28, 2022, p. 4.

<sup>43</sup> Ibid, p. 7: "Stakeholders from the solar industry have emphasized the need to site solar capacity in DEP's southeastern service territory due to available land and lower land costs to solar developers. However, DEP's southeastern territory has significant transmission congestion because of the large amount of solar generation currently located in this area. The large quantities of new solar capacity in the interconnection queue in that area are already resulting in larger transmission upgrade costs compared to DEC. If solar capacity and the necessary transmission upgrades are built in DEP's territory to meet DEC's carbon reduction goals, current cost allocation methodologies could cause the costs to be largely recovered from DEP customers."

<sup>44</sup> Ibid., p. 2: "On March 14, 2022, the Companies filed their Petition proposing a system-wide solar procurement request for proposal (RFP), which would seek to competitively procure a minimum of 700 megawatts (MW) of utility-owned and third-party solar capacity, after preliminary analysis in advance of the Companies' 2022 Carbon Plan (2022 Solar RFP)."

<sup>45</sup> Ibid, p. 7, footnote 4: "DEC and DEP's Transition Cluster Study Phase 1 results under Generator Interconnection Information, Generator Study, Transition Cluster folder. DEC: <https://www.oasis.oati.com/duk/>; DEP: <https://www.oasis.oati.com/cpl/>."

<sup>46</sup> Duke Energy Carolinas, LLC, *Transitional Cluster Study Phase 1 Report*, February 28, 2022, pp. 4-5 and pp. 10-11, available at [https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/2022-02-28\\_DEC\\_TC\\_Phase\\_1\\_Study\\_Report.pdf](https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/2022-02-28_DEC_TC_Phase_1_Study_Report.pdf). Projects are: ID126078 (40 MW), ID164382 (37.5 MW), and ID165980 (37.5 MW). The transmission upgrade costs are \$20.14 million, \$5.03 million, and \$19.38 million, respectively, a total of \$44.55 million (p. 11). In addition, these three solar projects may collectively require an Optical Ground Wire (OPGW) upgrade at a cost of \$77.498 million (pp. 4-5).

This cluster of DEC utility-scale solar projects could be substituted with NEM solar at a transmission savings of \$470 per year per 9 kW NEM system, as shown in Table 3 below. This transmission savings is substantially greater than the residential NEM cost-shift of \$360 per year (RE) and \$372 per year (RS) alleged by DEC.

**Table 3. Calculation of DEC avoided transmission expenditure if NEM solar substituted for utility-scale solar**

Element	Calculation	Value
Transmission upgrade costs estimated by DEC for 115 MW of utility-scale solar capacity (three projects) in Laurens County, SC	--	\$44.55 million
Annualized cost recovery factor for new DEC transmission <sup>47</sup>	--	0.1349
Annualized transmission upgrade cost	0.1349 x \$44.55 million	\$6.01 million/yr
Number of 9 kW NEM systems needed to produce 115 MW of solar output	115,000 kW ÷ 9 kW	12,778
Annual value of avoided DEC transmission upgrade cost per 9 kW NEM system	\$6.01 million/yr ÷ 12,778 systems	\$470/yr/system

DEC also indicates it may require Optical Ground Wire (OPGW) communications for utility-scale solar generators utilizing a DEC transmission circuit.<sup>48</sup> DEC estimates the OPGW upgrade cost for the 115 MW cluster of Laurens County, SC solar projects at \$77.498 million.<sup>49</sup> If DEC does ultimately require an OPGW upgrade for the Laurens County, SC solar projects, the avoided transmission/OPGW cost achieved by substituting NEM solar for this 115 MW of utility-scale solar capacity would be \$1,288 per year per 9 kW NEM system.<sup>50</sup>

The utility-scale solar transmission upgrade costs that raised Public Staff concerns are associated with Duke Energy's proposed procurement of 700 MW of utility-scale solar in 2022 only. The proposed solar projects are overwhelmingly located in counties, identified in Figure 2, as "transmission constrained" by Duke Energy.<sup>51</sup> The Laurens County solar projects are an example of the high cost of transmission upgrades needed to add more solar capacity in transmission constrained areas.

<sup>47</sup> NCWARN *et al.*'s Initial Comments, Attachment B, *Deployment of NEM Solar Allows Duke Energy to Eliminate New Transmission That Would Otherwise Be Built*, Table 4, p. 5. The annualized transmission cost recovery factor of 0.1349 is calculated from the known annualized cost of \$254 million per year for the \$1.883 billion San Diego Gas & Electric 500 kV Sunrise Powerlink transmission line (\$254 million/yr ÷ \$1,833 million = 0.1349/yr).

<sup>48</sup> Duke Energy Carolinas, LLC, *Transitional Cluster Study Phase 1 Report*, February 28, 2022, p. 17, available at [https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/2022-02-28\\_DEC\\_TC\\_Phase\\_1\\_Study\\_Report.pdf](https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/2022-02-28_DEC_TC_Phase_1_Study_Report.pdf).

<sup>49</sup> *Ibid.*, pp. 4-5.

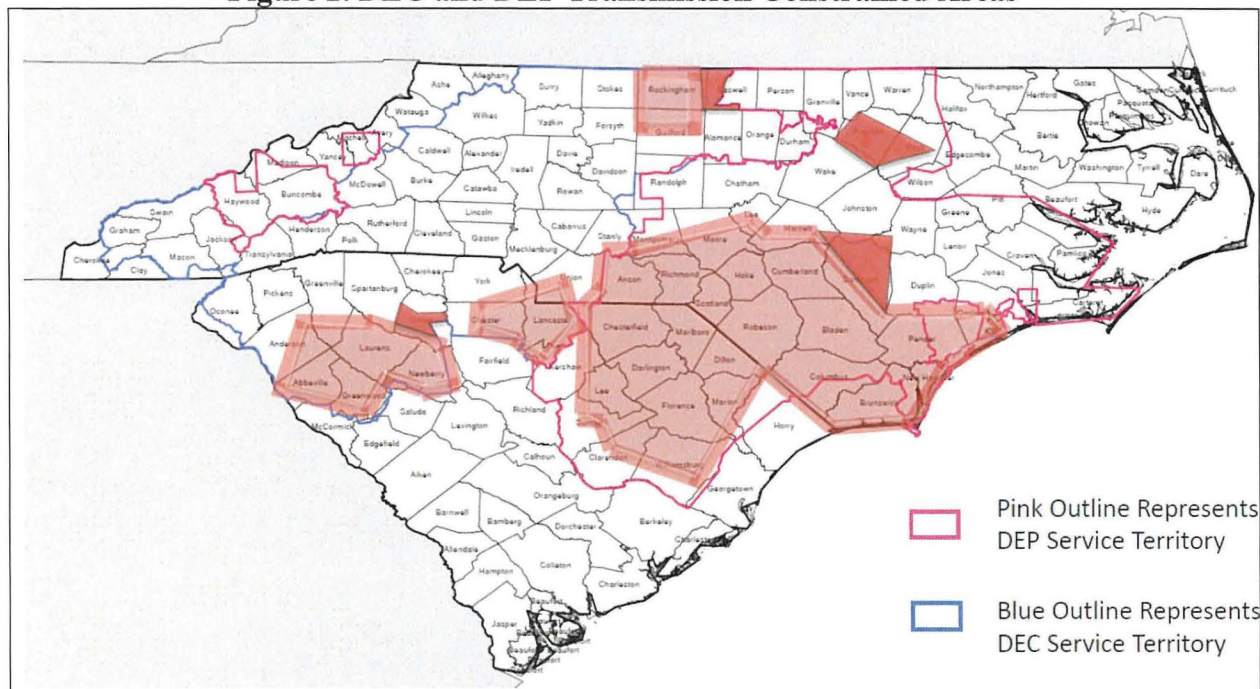
<sup>50</sup> [(\$44.55 million + \$77.498 million) x 0.1349] ÷ 12,778 systems = \$1,288/yr per 9 kW NEM system.

<sup>51</sup> See:

[https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/CPRE\\_Tranche\\_2\\_DEC\\_and\\_DEP\\_Constrained\\_Areas.pdf](https://www.oasis.oati.com/woa/docs/DUK/DUKdocs/CPRE_Tranche_2_DEC_and_DEP_Constrained_Areas.pdf).



**Figure 2. DEC and DEP Transmission Constrained Areas<sup>52</sup>**



The DEC and DEP 2020 Integrated Resource Plans (IRP) project the addition of at least 12,000 MW of new solar, more than seventeen times the 2022 procurement target of 700 MW, to achieve a combined DEC and DEP carbon reduction target of 70 percent by 2035.<sup>53</sup>

Duke Energy estimates the cost of new transmission, depending on the 70 percent IRP carbon reduction scenario, as high as \$8.9 billion.<sup>54</sup> The companies also estimate it will spend up to an additional \$10 billion in new transmission to facilitate increased power imports to support the carbon reduction scenarios.<sup>55</sup> The Public Staff's concern that *"the cost of transmission upgrades necessary to interconnect large volumes of solar may not result in least-cost compliance with HB 951's carbon reduction goals"* is well placed. Substituting NEM solar plus battery projects for utility-scale solar and wind power would largely eliminate these huge transmission costs, benefitting all Duke Energy customers.

There is a contradiction in the Public Staff accepting Duke's NEM cost-benefit assessment as good enough while expressing concern about the uncertain cost of transmission upgrades to facilitate utility-scale solar – costs that would be avoided by NEM solar and should be credited to NEM solar. These "uncertain" transmission costs must be quantified and credited to NEM as a benefit achieved by eliminating transmission upgrades that would otherwise be necessary to interconnect utility-scale solar proposed in areas of the state with inadequate transmission capacity.

<sup>52</sup> Ibid.

<sup>53</sup> DEC 2020 IRP, September 3, 2020, p. 16 (Columns D, E and F); DEP 2020 IRP, September 30, 2020, p. 16 (Columns D, E and F).

<sup>54</sup> Ibid.

<sup>55</sup> Ibid, pp. 58-59.

# Attachment B

The Companies' Response to the Public Staff's Data Request No. 3-3

**DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

**Request:**

For the proposed NEM Tariff, please provide a monthly bill comparison between a customer that interconnects its net metering system on December 31<sup>st</sup>, 2022 (under Rider NM) and a customer that interconnects on January 1<sup>st</sup>, 2023 (under the proposed Rider RSC). This response should estimate the customer's bill for each month for twelve months of operation and should assume the proposed NEM Tariffs are approved as filed.

**Response:**

The attached spreadsheets show a summary of the average monthly bills given 12 months of load shapes from the second meter project in 2019. The "Current Annual NEM" represents current policies as of December 31, 2022 (under Rider NM) and the "Grid Access Fee" column represents the policies assuming the proposed policies are approved (under proposed Rider RSC). Due to the high data quality of the analysis, this was conducted in SAS with the outputs displayed in Excel. This analysis utilized rates current as of October 12, 2021, which is when this was produced.



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PSDR%203-3\_DEPN  
C\_2019\_v10\_IDs%20I

Person responding: Bradley Harris, Developmental Assignment Leader

DEC-NC Net Metering Modeling  
Version 10.0 - 2019 Dataset, Final for Application: Monthly Net Exports at AC, \$0.35/kWh CPP, \$0.36/kW-DC Non-Bypassable Charge, \$22 Min Bill for CO, and \$2.05/kW-DC Grid Access Fee  
10/12/2021

RS Current Savings	\$ 909.17
RE Current Savings	\$ 1,025.06
RS Proposed Savings	\$ 643.11
RE Proposed Savings	\$ 708.32

The values above are utilized to estimate the revenue reduction for the marginal cross-subsidy study

\$22

PROFILE						BILLS									
ID	Rate	Capacity	Capacity Factor	Solar Gen	Load	Current No Solar	TOU No Solar	Current Annual NEM	Current Annual NEM + Cash Out	TOU Annual NEM + Cash Out	TOU Monthly NEM	Critical Peak Pricing	Non-Bypassable Charge	Minimum Bill	Grid Access Fee
		kW-AC	%	kWh/mo	kWh/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo	\$/mo
58%	Average: RS	8.4	14.9%	886	1,166	120.29	118.39	44.53	42.65	56.95	58.60	60.93	64.55	65.99	66.70
42%	Average: RE	10.0	15.1%	1,072	1,463	135.03	132.22	49.60	47.63	63.53	67.09	69.70	74.00	74.56	76.00
	Average: RS+RE	9.0	15.0%	964	1,291	126.48	124.20	46.66	44.74	59.71	62.17	64.62	68.52	69.59	70.61

DEP-NC Net Metering Modeling  
Version 10.0 = 2019 Dataset, Final for Application: Monthly Net Exports at AC, \$0.35/kWh CPP, \$0.44/kW-DC Non-Bypassable Charge, \$28 Min Bill for CD, and \$1.50/kW-DC Grid Access Fee  
10/12/2021

Current Savings \$ 1,171.31  
Proposed Savings \$ 821.23  
The values above are utilized to estimate the revenue reduction for the marginal cross-subsidy study

PROFILE					BILLS									
ID	Capacity	Capacity	Solar Gen	Load	Current	TOU	Current	Current	TOU	TOU	Critical	Non-	Minimum	Grid Access
	kW-AC	Factor	kWh/mo	kWh/mo	No Solar	No Solar	Annual	Annual	Annual	Monthly	Peak Pricing	Bypassable	Bill	Fee
		%			\$/mo	\$/mo	\$/mo	NEM +	NEM +	NEM	\$/mo	Charge	\$/mo	\$/mo
Average:	9.1	15.0%	971.27	1,303	151.57	147.20	53.96	Cash Out	Cash Out	72.37	74.95	79.75	82.37	83.13

\$28

# Attachment C

The Companies' Response to NC WARN's Data Request No. 1-11



NC WARN  
Docket No. E-100, Sub 180  
Net Metering  
NC WARN Data Request No. 1  
Item No. 1-11  
Page 1 of 1

OFFICIAL COPY

May 12 2022

**DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

**Request:**

Provide all net energy metering solar full cost of service studies conducted by the Companies to support the proposed net energy metering solar tariffs.

**Response:**

Please see attached.



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# Attachment D

The Companies' Response to the Public Staff's Data Request No. 1-28

May 12 2022

OFFICIAL COPY

**DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, LLC**

**Request:**

Please explain why the Companies declined to perform a Value of Solar Study to assist in developing the proposed Rider RSC.

**Response:**

While the Companies did not retain a third party to perform a Value of Solar Study (VOSS), as part of the Comprehensive Rate Review stakeholder process, the Companies did perform a VOSS, which was shared with stakeholders. Duke Energy provided embedded and marginal cost analyses, which used North Carolina Utility Commission (NCUC)-approved methodologies for rate design and evaluation of Demand-Side Management and Energy Efficiency (DSM/EE) programs. The Companies believe this is the appropriate way to value rooftop solar assets because these are the same methods utilized to allocate embedded costs or evaluate any DSM/EE program. Duke's modeling of rooftop solar also used the same valuation of avoided cost.

Through numerous regulatory proceedings, the Public Staff and NCUC have provided the appropriate level of independent review that has resulted in finding the methodologies the Companies used to perform its internal VOSS to be appropriate, prudent and in the public interest.