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BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

DOCKET NO. 2020-229-E

In the Matter of: Dominion Energy South Carolina, Incorporated's Establishment of a Solar Choice Metering Tariff Pursuant to S.C. Code Ann. Section 58-40-20 (See Docket No. 2019-182-E)	)))))))))))))))	**SURREBUTTAL 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**

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I. INTRODUCTION AND QUALIFICATIONS

Q: PLEASE STATE FOR THE RECORD YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A: My name is R. Thomas Beach. I am principal consultant of the consulting firm Crossborder Energy. My business address is 2560 Ninth Street, Suite 213A, Berkeley, California 94710.

Q: HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS DOCKET?

A: Yes. On January 21, 2021, I provided direct testimony proposing a new Solar Choice tariff for Dominion Energy South Carolina (DESC). I submitted this testimony on behalf of South Carolina Coastal Conservation League, Upstate Forever, Southern Alliance for Clean Energy, Vote Solar, the Solar Energy Industries Association, and the North Carolina Sustainable Energy Association. My experience and qualifications are described in my direct testimony and in the *curriculum vitae* (CV), which is **Exhibit RTB-1** to my direct testimony.

Q. WHAT IS THE PURPOSE OF THIS SURREBUTTAL TESTIMONY?

A. This surrebuttal testimony responds to the direct testimony of the Office of Regulatory Staff filed on January 21, 2021 and to DESC's rebuttal testimony submitted February 12, 2021. This surrebuttal testimony is provided on behalf of the same parties as my direct testimony.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A: The first section of my testimony responds to the adjustments that ORS witness Brian Horii proposed to DESC's proposed Solar Choice tariff. The DESC Solar Choice tariff is essentially a rate with a very large monthly fixed charge and lower TOU energy

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charges. Such a rate design rewards residential customers who use a lot of energy, either because they are wealthier or because they use energy inefficiently. Because the fixed monthly subscription fee increases as the solar system size increases, solar bill savings increase very little as the size of the customer's solar system increases. My direct testimony showed that the result of this structure is that the only residential solar systems that would be economic are small systems 3 kW or less in size installed by large residential customers, for whom the solar system would serve just 40% or less of their usage. In response, ORS has now filed testimony that proposes to make adjustments to the DESC proposal to close off any economic opportunity for customers to install even small 3 kW solar systems. As with the DESC Solar Choice proposal, this is not the result that Act 62 intended. Like DESC, ORS fails to recognize or evaluate any benefits of distributed solar beyond the basic avoided energy and capacity costs that apply to large wholesale QF generators. ORS does so even though its witness, Mr. Horii, recommended in the companion Docket No. 2019-182-E on methodology that DESC's avoided T&D costs should be evaluated and considered in the development of its Solar Choice tariffs. Finally, both ORS and DESC fail to quantify the avoided costs associated with decarbonizing South Carolina's electric system. The new renewable capacity from distributed solar will leverage private capital and federal tax benefits to expand the state's clean energy infrastructure, avoiding the need for future utility costs.

This surrebuttal also responds to various issues raised in the rebuttal testimony submitted by DESC on February 12, 2021. Key points of this response include:

- It is not unreasonable for marginal/avoided costs to exceed embedded costs;

- There are a number of ways for the Commission to give weight to important societal benefits without including them directly in the calculation of Solar Choice rates;
- Clarification that my testimony does not propose eliminating the Basic Facilities Charge (BFC) or changing to how the Minimum Bill operates;
- Support for using Rate 5 with DESC's standard tome-of-use periods, rather than DESC's proposed non-standard time-of-use periods for Solar Choice customers; and
- Showing that there is substantial evidence and sufficient analysis that only customers with small systems will benefit from DESC's proposed tariffs.

II. RESPONSE TO ORS

Q: PLEASE SUMMARIZE ORS WITNESS HORII'S PROPOSED CHANGES TO DESC'S SOLAR CHOICE TARIFF.

A: Mr. Horii proposes a lower subscription charge, but higher TOU energy charges than DESC's proposed Solar Choice tariff. He asserts that this change is necessary to correct an "error" in DESC's analysis of the alleged "cost shift" associated with the current NEM program. The result of the supposed error, Mr. Horii asserts, is an underestimate of the cost shift, particularly for customers who install small solar systems in the 3 kW range. He notes that the structure of the DESC Solar Choice tariff favors small, 3 kW systems – a conclusion that I also reached in the analysis of the DESC proposal in my direct testimony.

Q: WHAT WOULD BE THE RESULT OF THE MODIFICATIONS TO DESC'S PROPOSED SOLAR CHOICE RATES THAT ORS RECOMMENDS?

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A: The changes that Mr. Horii recommends to the DESC-proposed rates would reduce substantially the available savings from solar systems of all sizes.

I have added the impacts of the ORS proposal to Tables 5 to 8 of my direct testimony, in which I analyzed the DESC proposal. These tables are shown below. The revised **Table 5** shows the annual average bill savings under DESC's and ORS's proposed Solar Choice rates, using the same representative solar customer that DESC witness Everett used to develop the DESC proposal, and compares them to the bill savings under the current NEM program (on the tiered Rate 8) and to our proposed Solar Choice tariff.

Table 5 (revised): Comparison of Residential Bill Savings

Proposal	Bill Savings		% Change from Current NEM
	$/month	*$/kWh*	
Current NEM Tiered Rate	115	0.116	--
Vote Solar *et al*. Solar Choice	109	0.110	-5%
DESC Solar Choice	52	0.053	-55%
ORS Solar Choice	42	0.043	-63%

On a 25-year levelized basis, the DESC and ORS proposal would produce bill savings of $0.062 per kWh and $0.049 per kWh, respectively.[1] This compares to 25-year levelized solar costs of $0.094 per kWh for cash purchases and $0.115 per

[1] The 25-year levelized bill savings assume 2% annual escalation in rates, 0.5% annual degradation in solar output, and an 8.5% discount rate.

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kWh for financed systems.[2] Thus, the typical residential solar customer would see their costs increase by $0.03 to $0.06 per kWh of solar output, compared to not adopting solar. Thus, residential solar systems would no longer be an economic investment under either DESC's or ORS's proposed tariffs. Only those affluent customers who can afford and are willing to pay more for their electric service would choose to install solar.

The revised **Table 6** compares bill savings under the current NEM tariff to those under the DESC and ORS Solar Choice tariffs, for a range of solar system sizes, again for the typical residential customer from Ms. Everett's testimony.

Table 6 (revised): *Change in Bill Savings – Current NEM to DESC Solar Choice*

Typical Solar Customer - 13,544 kWh per year electric usage

Solar Output as % of Customer Annual Usage	**System Size *(kW-AC)***	**Bill Savings**				
		Current NEM Tariff	**DESC Solar Choice**		**ORS Proposal**	
	kW-AC	*$/month*	*$/month*	*% change*	*$/month*	*% change*
90%	7.1	117	52	-56%	43	*-64%*
87%	6.9	115	52	-55%	42	-63%
80%	6.3	105	52	-51%	40	-62%
70%	5.5	92	51	-44%	38	-59%
60%	4.8	79	51	-36%	35	-56%

[2] These solar costs are net of the tax benefits of the 26% federal tax credit (which the U.S. Congress recently extended through 2022) and the 25% state tax credit (capped at $3,500). The levelized costs also consider financing costs, ongoing costs for O&M, inverter replacement, and the customer's discount rate.

50%	4.0	66	50	-24%	32	-52%
40%	3.2	53	49	-7%	28	-47%
32%	2.5	43	46	+7%	23	-46%
30%	2.4	40	45	+11%	21	-47%
20%	1.6	27	38	+42%	12	-54%
10%	0.8	13	30	+138%	1	-92%

The analysis shows that the DESC tariff would maintain (or increase) the current level of bill savings only for small systems that serve no more than about 40% of their load.[3] The ORS modification would result in major reductions in bill savings – on the order of one-half to two-thirds – across all system sizes.

The following revised **Table 7** is the same analysis as Table 6, with similar results, for a very large residential customer using 16,000 kWh per year.

Table 7 (revised): *Change in Bill Savings – Current NEM to DESC Solar Choice*

Very Large Solar Customer - 16,000 kWh per year electric usage

Solar Output as % of Customer Annual Usage	**System Size *(kW-AC)***	**Bill Savings**				
		Current NEM Tariff	**DESC Solar Choice**		**ORS Proposal**	
	kW-AC	*$/month*	*$/month*	*% change*	*$/month*	*% change*
90%	8.4	138	63	-54%	52	-62%

[3] This is far below the size of the typical Act 236 system, which serves 87% of the customer's load.

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80%	7.5	125	63	-49%	50	-60%
70%	6.6	109	63	-43%	47	-57%
60%	5.6	94	62	-34%	44	-54%
50%	4.7	78	62	-22%	40	-49%
40%	3.7	63	60	-4%	35	-44%
30%	2.8	47	58	+22%	29	-39%
20%	1.9	31	50	+59%	18	-42%
10%	0.9	16	41	+162%	5	-67%

Revised **Table 8** below is the same analysis presented in revised Tables 6 and 7, except for a smaller customer with 7,000 kWh per year of electric use. For this small customer, both the DESC and ORS tariffs would produce major reductions in bill savings compared to current NEM, for all system sizes.

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Table 8 (revised): *Change in Bill Savings – Current NEM to DESC Solar Choice Small Solar Customer - 7,000 kWh per year electric usage*

Solar Output as % of Customer Annual Usage	System Size (kW-AC)	Bill Savings				
		Current NEM Tariff	DESC Solar Choice		ORS Proposal	
	kW-AC	*$/month*	*$/month*	*% change*	*$/month*	*% change*
90%	3.7	60	21	-64%	17	-72%
80%	3.3	54	21	-60%	16	-71%
70%	2.9	47	21	-57%	14	-71%
60%	2.5	41	18	-55%	11	-73%
50%	2.0	34	16	-54%	8	-76%
40%	1.6	27	13	-52%	5	-82%
30%	1.2	20	10	-51%	1	-95%
20%	0.8	13	10	-52%	(4)	-127%
10%	0.4	7	3	-61%	(9)	-240%

Q: DOES MR. HORII FOR ORS PROVIDE A SIMILAR ANALYSIS OF HOW SOLAR BILL SAVINGS WOULD CHANGE, COMPARED TO THE CURRENT NEM TARIFF, UNDER THE DESC AND ORS PROPOSALS?

A: Yes. Figure 6 of his testimony also shows that the ORS proposal would result in a major reduction in bill savings – to roughly one-third of the current level – across all sizes of solar systems. This figure also shows that, under the DESC proposal,

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the reduction in bill savings is more moderate for small, 3 kW systems, but grows as system size increases. The impacts of the DESC and ORS proposals are similar for larger system sizes.

Q: IN YOUR DIRECT TESTIMONY, YOU ARGUE THAT THE MAJOR REDUCTION IN BILL SAVINGS UNDER THE DESC PROPOSAL WOULD BE CONTRARY TO ACT 62. DOES THE SAME ARGUMNT APPLY TO THE ORS PROPOSAL?

A: Yes. Act 62 first provides that the intent of the Solar Choice tariff is to "build upon the successful deployment of solar generating capacity through Act 236 of 2014 to continue enabling market driven, private investment in distributed energy resources across the State by reducing regulatory and administrative burdens to customer installation and utilization of onsite distributed energy resources."[4] DESC's proposed Solar Choice tariff would place unreasonable new limitations on the size of the solar systems that would be economic to deploy in DESC's service territory, while the ORS modifications would remove any economic incentive to install a solar system of any size. Thus, both of these proposed tariffs would erect a new barrier to broad customer use of this clean energy technology, particularly by smaller residential customers, as shown in revised Table 8.

The next section of Act 62 states that the Solar Choice tariffs should "avoid disruption to the growing market for customer scale distributed energy resources."[5] Both the DESC and ORS proposals clearly would disrupt the solar market in DESC's service territory.

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[4] Section 58-40-20(A)(1).
[5] Section 58-40-20(A)(2).

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Q: DOES MR. HORII EXAMINE HOW HIS PROPOSAL WOULD IMPACT THE ECONOMICS OF INSTALLING SOLAR, SUCH AS THE IMPACT ON SOLAR CUSTOMERS' PAYBACK PERIODS?

A: No, he does not. I credit Mr. Horii for admitting this directly, stating that his assignment in preparing his testimony did not include an examination of how his proposal would impact customer paybacks.[6]

Q: HAVE YOU CALCULATED THE SIMPLE PAYBACKS FOR A TYPICAL SOLAR SYSTEM UNDER THE SOLAR CHOICE RATES THAT ORS PROPOSES?

A: Yes. As noted in my direct testimony, the typical 7 kW-AC system which DESC used to develop its tariff would have an initial cost, after federal and state tax credits, of $12,910.[7] Given the monthly bill savings of just $42 under the ORS rates (see revised Table 5), the simple payback on this system is 25 years. In other words, it would take the entire expected life of a solar system for a customer just to realize the return <u>of</u> their investment, with zero return <u>on</u> that investment. Further, this calculation is for a cash purchase. If the customer uses a loan to purchase the system, the addition of financing costs makes this investment even less attractive, compared to the other uses to which a person can put their scarce capital.

Q: YOUR DIRECT TESTIMONY OBSERVES THAT DESC DESIGNED ITS SOLAR CHOICE RATE USING ONLY AVOIDED COSTS FOR ENERGY AND GENERATING CAPACITY, WITHOUT CONSIDERING AVOIDED TRANSMISSION AND DISTRIBUTION COSTS OR OTHER

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[6] See ORS Testimony (Horii), at p. 26.
[7] See Vote Solar *et al*. Testimony (Beach), at p. 21.

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QUANTIFIABLE BENEFITS OF DISTRIBUTED SOLAR.[8] DOES THE SAME CRITICISM APPLY TO ORS' PROPOSAL?

A: Yes. Neither the DESC nor the ORS proposals consider avoided transmission and distribution (T&D) costs, or any of the other benefits of distributed solar that the Commission adopted in Order No. 2015-194 implementing Act 236. Act 62 requires consideration of all of these benefits. Section 58-40-20(D) of Act 62 directs the Commission to consider "the aggregate impact of customer generators on the electrical utility's long-run marginal costs of generation, distribution, and transmission" as well as "the value of distributed energy resource generation according to the methodology approved by the commission in Commission Order No. 2015-194." DESC and ORS both assumed zero marginal or avoided T&D costs in the development of their proposed rates. Mr. Horii for ORS admits that the ORS rates in his testimony would need to be re-calculated if the Commission were to adopt non-zero values for avoided T&D costs.[9]

Q: HAS MR. HORII TESTIFIED IN THESE NET METERING DOCKETS THAT DISTRIBUTED SOLAR SYSTEMS CAN PROVIDE THE BENEFIT OF AVOIDING T&D COSTS?

A: Yes, he has. In his testimony in the methodology Docket No. 2019-182-E, he testified as follows:

The investigation of the current NEM program should certainly consider cost and benefit impacts to the utility. In most cases, NEM systems can result in lower utility

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[8] *Ibid*., at pp. 26-28.

[9] See ORS Testimony (Horii) at pp. 14-15: "Should the Commission adopt non-zero values for components such as T&D, the Subscription Fees may need to be further modified."

costs (benefits), such as lower energy production and procurement costs, lower generation capacity acquisition costs, and lower transmission and distribution ("T&D") capacity costs.[10]

Q: DOES MR. HORII PROVIDE INFORMATION SHOWING THAT MOST COST-EFFECTIVENESS STUDIES OF DISTRIBUTED SOLAR CALCULATE NON-ZERO VALUES FOR AVOIDED T&D?

A: Yes. Exhibit BKH-2 is an E3 study *Discussion of South Carolina Act 236: Version 2.0* dated December 2018. Figure 5 of this study shows the different avoided cost benefits calculated in 23 studies of the value of distributed solar, including several performed by E3. 22 of these studies include a benefit for avoided T&D capacity.[11] Mr. Horii's qualifications show that he has worked on several NEM cost-effectiveness evaluations that have included significant avoided T&D costs.[12] If ORS had asked Mr. Horii and E3 to evaluate the benefits of avoided T&D capacity costs on the DESC system, I have no doubt that Mr. Horii and his firm could have accomplished that task.

Q: HAS MR. HORII RECOMMENDED THAT THE MARGINAL COST ANALYSES OF NEW SOLAR CHOICE TARIFFS SHOULD EVALUATE AVOIDED T&D COSTS?

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[10] Docket No. 2019-182-E, ORS Testimony (Horii), at p. 4 (emphasis added).

[11] The only exception appears to be a study of distributed solar in Hawaii, which of course has a more limited T&D system due to the island nature of that state. The 2013 Xcel Energy study of the value of solar for Public Service of Colorado does not appear to show an avoided T&D value, but that study does include a small avoided T&D component that is difficult to see on this graph.

[12] See ORS Testimony (Horii), at pp. 2-3. These include the methodology for calculating avoided costs used by the California Public Utilities Commission (CPUC) for evaluating distributed energy resources since 2004 and developing the NEM "Public Tool" used by California stakeholders in 2015 to evaluate NEM program revisions in California.

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A: Yes. In his testimony in Docket No. 2019-182-E, Mr. Horii discussed the 2018 E3 study that is Exhibit BKH-2, commenting that:

… the study, like the PURPA tariffs, included T&D capacity values of zero ($0). I believe that assumptions of zero ($0) T&D capacity value for NEM solar should be revised and a system average non-zero value be included in the marginal cost analysis used to inform any new NEM rates.[13]

When asked whether there are "valid reasons to exclude distribution capacity costs from the marginal cost analyses for a solar choice metering tariff," Mr. Horii responded:

No. While it is true that load growth related distribution investments are highly time and location specific, it is clearly possible to calculate distribution marginal capacity costs, and there are myriad examples of jurisdictions that do so. For example, a benchmarking study submitted to the Colorado PUC in 2014 includes a survey of avoided T&D costs for twenty (20) states or regions.[14]

Similarly, with respect to avoided transmission costs, he states:

I recommend that transmission marginal capacity costs also be included. There are simple straightforward methods to calculate marginal T&D capacity costs with limited requirements for data.[15]

Pages 24-31 of Mr. Horii's testimony for ORS in Docket No. 2019-182-E are an extensive evaluation and critique of DESC's calculations of marginal T&D capacity costs. Yet his testimony for ORS in this docket includes the same assumptions of

[13] Docket No. 2019-182-E, ORS Testimony (Horii), at p. 17.
[14] *Ibid*., at p. 24.
[15] *Ibid*., at p. 27.

zero ($0) T&D capacity value for NEM solar that he recommended should be changed in Docket No. 2019-182-E.

Q: THE COMMISSION IS ALSO CONSIDERING THE DUKE UTILITIES' PROPOSED SOLAR CHOICE TARIFFS IN DOCKET NOS. 2020-264-E AND 2020-265-E. DID THOSE UTILITIES INCLUDE AVOIDED T&D CAPACITY COSTS IN THEIR EVALUATIONS OF THOSE TARIFFS?

A: Yes, they did.[16] The Duke utilities appear to have used the same avoided T&D values that they use to assess other types of distributed, customer-sited resources, such as energy efficiency and demand-side management programs. The Duke utilities were able to reach a stipulation with key stakeholders, including the sponsors of this testimony, on the design of their Solar Choice tariffs. If approved, the rates in those tariffs will result in only a modest reduction (on the order of 10%) in the bill savings available to customers who elect the new Solar Choice tariffs.[17]

Q: THE QUESTIONS ABOVE HAVE FOCUSED ON THE FAILURE OF ORS AND DESC TO QUANTIFY AVOIDED T&D COSTS. ARE THERE OTHER AVOIDED COST ELEMENTS RECOGNIZED IN ACTS 236 AND 62 THAT ORS (AND DESC) HAVE FAILED TO QUANTIFY?

A: Yes. My rebuttal testimony in Docket No. 2019-182-E, included as an exhibit to my direct testimony in this docket, quantifies the benefits of distributed solar on the DESC system for fuel hedging and avoiding future costs of carbon emissions. Again, Mr. Horii's testimony for ORS in Docket No. 2019-182-E recognizes these

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[16] See Docket Nos. 2020-264-E and 2020-265-E, Direct Testimony of Bradley Harris for DEC/DEP, at Harris Direct Exhibit 2.

[17] See Docket Nos. 2020-264-E and 2020-265-E, Direct Testimony of R. Thomas Beach for Vote Solar *et al*., at p. 8.

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benefits and recommends that they be quantified and considered in this proceeding, although not as part of the direct development of Solar Choice rates:

There are a myriad of additional social or market benefits that can be provided by distribution renewable resources like behind-the-meter solar. CO_2 value, healthcare and mortality impacts from criteria pollutant reductions, market price impacts, and increased jobs are a few. Of these, benefits that rely upon the existence of wholesale energy or capacity markets (such as market price multiplier or Demand Reduction Induced Price Effect) should not be included since South Carolina does not have active markets.

The other benefits can be investigated and quantified, and Section 58-40-20(C) of Act 62 explicitly recognizes "the indirect economic impact of the net energy metering program to the State." However, such indirect impacts should not be included in the primary valuation of NEM. Rather, such benefits can be included in consideration of the tradeoffs between the goal of eliminating "any cost shift to the greatest extent practicable" and the South Carolina General Assembly's intent to "avoid disruption to the growing market for customer-scale distributed energy resources."

Figure 5 of Mr. Horii's Exhibit BKH-2, summarizing the avoided cost elements of other value of solar studies, also shows that most such studies include avoided costs associated with fuel hedging and with decarbonizing the grid (such as the categories of Avoided Renewables and Environmental).

III. <u>RESPONSE TO DESC REBUTTAL</u>

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Q: DESC WITNESS MARGOT EVERETT OPINES THAT "BASIC LOGIC CANNOT SUPPORT" AVOIDED COST BENEFITS THAT EXCEED THE UTILITY'S EMBEDDED COST RATES.[18] PLEASE COMMENT.

A: Ms. Everett clearly understands the difference between marginal and embedded costs, as shown by her accurate discussion of the difference between marginal and embedded cost studies.[19] Marginal costs measure how system costs change "on the margin" due to a change in customer usage or demand. Marginal costs can be either above or below the historical system average costs that are "embedded" in current rates. Marginal costs can exceed average/embedded costs particularly when there are system constraints or societal goals that require new investment in our energy infrastructure. Examples of such constraints and goals are decarbonizing the electric system and making generation and T&D infrastructure reliable and resilient in the face of new threats and uncertainties from climate change. Marginal costs also can exceed embedded costs if energy costs are rising or if new capacity is needed to meet rising demand. To illustrate this, Figure 5 of Exhibit BKH-2 of Mr. Horii's testimony shows the marginal/avoided cost components in 23 value of solar studies, and compares these total marginal/avoided costs to the average/embedded cost residential rate for each of the utilities studied (the average residential rate is the gold diamond indicated for each study). For 14 of the 23 studies, the marginal/avoided costs exceed the embedded cost residential rate.

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[18] See DESC Rebuttal Testimony (Everett), at p. 35.
[19] *Ibid*., at pp. 2-5.

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Q: DESC WITNESS EVERETT ALSO ARGUES THAT THE COMMISSION SHOULD NOT CONSIDER SOCIETAL BENEFITS IN DEVELOPING SOLAR CHOICE TARIFFS.[20] DO YOU AGREE?

A: Ms. Everett characterizes these benefits as "hypothetical." I do not think that the health benefits from reductions in criteria air pollutants, or the benefits of reducing the societal damages from climate change, are hypothetical. The science of these societal impacts is real. It is standard economics to attempt to "internalize" real externalities that are direct costs to society as a whole, but that today are not direct costs to the utility. Unless utility procurement is sensitive to the costs it imposes on society, it will undervalue the product that it provides. In discovery, Ms. Everett admitted that externalities should be included in marginal or avoided costs if they can be measured and not double-counted.[21] None of the societal benefits that I have calculated and presented in this docket duplicate the direct benefits.

Q: PLEASE DISCUSS THE POSSIBLE AND APPROPRIATE ROLES OF QUANTIFIABLE SOCIETAL BENEFITS IN APPROVING NEW SOLAR CHOICE TARIFFS.

A: Quantifiable societal benefits can play a number of possible roles. Mr. Horii's testimony for ORS in Docket No. 2019-182-E suggests several roles for the societal

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[20] See Rebuttal testimony of Margot Everett at pages 37-39.

[21] See DESC response to Vote Solar et al. data request dated October 13, 2020, Q14. The DESC response states "S.C. Code Ann. § 58-40-20(C)(1)(4) specifically notes "the direct and indirect economic impact of the net energy metering program to the State" and Ms. Everett supports the review and rigorous computation of such direct and indirect impacts. Ms. Everett also believes that care must be taken to ensure that economic benefits are not double counted, such as including benefits of reduced criteria pollutants, carbon regulation costs, and reduced costs to power plants, which are already included in the avoided cost components in the NEM Methodology."

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or "indirect" economic benefits of distributed solar. One is related to meeting several of the important, but potentially conflicting, goals of Act 62:

These indirect impacts should be included in consideration of the tradeoffs between the goal of eliminating "any cost shift to the greatest extent practicable" and the South Carolina General Assembly's intent to "avoid disruption to the growing market for customer-scale distributed energy resources," but these costs should not be included in the avoided cost framework specifically documented within Commission Order No. 2015-194.[22]

He also suggests that societal benefits can offset a residual cost shift:

Assume that the direct economic benefits (energy-related, generation capacity, T&D capacity, and environmental compliance) average $100 per month for a new NEM solar system installed behind a customer's meter. Further, assume that the bill savings for a customer installing solar averages $150 per month under the Solar Choice Metering Tariff under consideration. This indicates that there is a $50/month cost shift from the NEM customer to all utility customers (note that the NEM customer will also see an increase in the future to accommodate the cost shift, so all customers bear the cost shift, not just non- NEM customers).

Now if the indirect economic benefits were $80 per month, then one could more easily accept a $50 per month cost shift since that solar system is providing more benefits (including indirect) than the bill reduction that is "funding" the solar system.[23]

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[22] Docket No. 2019-182-E, ORS Testimony (Horii), at p. 32.
[23] *Ibid*., at p. 6.

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In addition, estimates of the long-run marginal or avoided costs for a utility are based on forecasts that are inherently uncertain, even for well-accepted avoided cost components such as energy, generation capacity, and T&D capacity. There also can be variations in the quantifications of marginal/avoided costs, producing a range of results. If a distributed resource has significant societal benefits, these additional benefits can be assumed to offset the uncertainties in the calculation of the direct benefits.

All of these are ways that the Commission can consider and use quantifiable societal benefits in its deliberations, without using them as a direct input into the design of the Solar Choice tariff.

Q: DESC WITNESS EVERETT ARGUES THAT YOU PROPOSE TO ELIMINATE THE BASIC FACILITIES CHARGE (BFC) AND INSTEAD APPLY A MINIMUM BILL, WHICH WOULD REDUCE TOTAL BILL REVENUES TO BELOW THE SUM OF THE BFC AND MINIMUM BILL. MS. EVERETT ARGUES THIS BUFFET-STYLE RATE SELECTION HIGHLIGHTS YOUR INTENT TO BENEFIT SOLAR CHOICE CUSTOMERS RATHER THAN ELIMINATE COST SHIFTS.[24] PLEASE COMMENT.

A: I have not proposed to eliminate the BFC. I proposed setting the monthly minimum charge to the level of customer-related costs (which could exceed the BFC), in order to ensure that all customer-related costs will be collected from all customers, both NEM and non-NEM. Ms. Everett's example of a customer reducing costs

[24] See Rebuttal Testimony of Margot Everett at pages 17-19.

below an exemplary $10 BFC and a $5 energy charge, due to "elimination" of the BFC, incorrectly assumes that a $10 minimum bill would only apply to energy charge component of the bill, with no BFC. The monthly minimum charge today, as stated in DESC's tariffs, includes the BFC.[25] I have not proposed changing that structure. Thus, Ms. Everett mischaracterizes my position on the minimum bill. I do not agree that setting minimum bills so as to recover approved customer-related costs in any way demonstrates lack of interest on my part in preventing cost shifting. My position respects cost causation, by ensuring that all customers pay the customer-related costs that do not vary with usage.

Q: DESC WITNESS EVERETT DISAGREES WITH YOU THAT THE RATE 5 TOU RATE IS MORE ACCURATE THAN THE RATE 9 TOU RATES PROPOSED IN THE DESC SOLAR CHOICE TARIFFS. DO YOU AGREE WITH HER CRITICISM THAT YOU PROPOSE USING THE ALREADY-AVAILABLE RATE 5 TOU RATE STRUCTURE, WHICH IS OVER 30 YEARS OLD?[26]

A: No. That rate structure includes DESC's standard TOU periods, which align more closely with DESC's system peak loads than the proposed Solar Choice tariff TOU periods, in which peak periods would only exist for December to January weekday mornings and June to September weekday evenings. Rate 5 TOU periods are broader, including a broader set of June to September evening hours, and a broader

[25] The Rate 5 tariff states: "C. Minimum Bill: The monthly minimum charge shall be the basic facilities charge and the Distributed Energy Resource Program charge, as stated below." See https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/south-carolina/rates-and-tariffs/rate5.pdf.

[26] See Rebuttal Testimony of Margot Everett, at page 27.

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set of morning hours in all winter months from October to May. These broader period hours do a better job of aligning with how costs are allocated to the utility system peaks. For example, DESC allocates generation and transmission costs based on coincident peak usage during the peak summer afternoon (typically in July) from 2:00 to 6:00 p.m., which overlaps with the standard summer 2:00 to 7:00 p.m. peak period in Rate 5, but would only overlap by 2 hours with the DESC's proposed Solar Choice summer on-peak period of 4:00 to 8:00 p.m. Moreover, there is no strong reason to subject solar customers to a unique set of TOU periods that are not used for any other customers. If a TOU period update is required for DESC, it is preferable to do it for all customers, not piecemeal starting with NEM customers alone. TOU periods are important for signaling customers when energy is more or less valuable on the system as a whole, and should not be simply another mechanism for adjusting the value of solar generation to the customer. For example, if a solar customer installs other measures, such as an EV, should they be sent a price signal that they can charge during any hours in March to May (as under the DESC Solar Choice TOU periods), or would it be preferable to use the Rate 5 TOU periods that send a price signal to customers to avoid charging during the 2:00 to 7:00 p.m. on-peak period in those months? I conclude that the latter outcome is strongly preferable, and there is little justification for the use of non-standard TOU periods only for solar customers.

Q: DESC WITNESS EVERETT ARGUES THAT, ONCE RATES ARE SET IN A RATE CASE, THE COSTS TO SERVE A CUSTOMER ARE BASED ON THE CUSTOMER'S USE AT THE TIME OF THE COST-OF-SERVICE

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STUDY, EVEN FOR A CUSTOMER THAT THEN INSTALLS A SOLAR SYSTEM THAT REDUCES THEIR LOAD.[27] DOES THIS MEAN THAT RATES FOR SOLAR CUSTOMERS SHOULD BE SET TO RECOVER WHAT THEY WERE BILLED BEFORE THEY INSTALLED SOLAR, AS DESC HAS DONE?

A: No. Solar systems are long-lived clean energy infrastructure, with a useful life of 25 years. It is inaccurate and inequitable to assess the utility costs that they avoid over a short-term period such as a single rate case cycle. Act 62 requires an assessment of "the aggregate impact of customer generators on the electrical utility's long-run marginal costs of generation, distribution, and transmission."[28] The reality is that, in considering the costs avoided by DG solar, the only costs that are avoided immediately are the utility's reduced energy costs from not having to produce the kWh that solar supplies. All of the avoided capacity-related costs that result from solar – for generation, transmission, and distribution – are realized in the long-run, over time and multiple rate case cycles, as the lower loads resulting from rooftop solar allow the utility to build fewer facilities.

Q: DESC WITNESS EVERETT ASSERTS THAT YOUR SOLAR CHOICE TARIFF PROPOSAL WILL HARM LOW-INCOME CUSTOMERS.[29] PLEASE RESPOND.

A: My analysis shows that our Solar Choice tariff will benefit all non-participating customers, including low-income customers, because a full set of avoided cost

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[27] *Ibid*., at pp. 5-6.
[28] See Section 58-40-20(D) of Act 62 (emphasis added).
[29] See DESC Rebuttal Testimony (Everett), at page 36.

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benefits, including avoided T&D are used in the analysis. Moreover, our proposal will not significantly reduce bill savings, thus providing low- and moderate-income customers with a better opportunity to install solar. In contrast, under the DESC proposal, low-income customers with low annual usage (such as presented in my Table 8) would see substantially reduced bill savings, no matter what amount of solar kW is installed. On the other hand, larger and wealthier customers, as summarized in my Tables 6 & 7, would see increased bill savings for amounts of solar generation less than 40% of the customer's annual usage.

Q: DESC WITNESS SCOTT ROBINSON STATES THAT ALIGNED RESULTS FOR THREE METRICS, INCLUDING LEVELIZED BILL RATIO, RETURN ON INVESTMENT, AND SIMPLE PAYBACK, FOR ALL SYSTEM SIZES AND COST SCENARIOS HE STUDIED DEMONSTRATE THERE IS NO EVIDENCE THAT ONLY SMALL SYSTEMS WILL BENEFIT FROM THE DESC TARIFF. DO YOU AGREE?

A: No. Mr. Robinson claims to have studied systems ranging from 3 kW to 7 kW DC. He says a 7.2 kW-DC (5.7 kW-AC) system would save the customer $769 per year, and have a 15-year simple payback period. I had estimated a 20-year payback period for a system of a similar size, although this also depends on the size of the customer. He claims that a 3.0 kW DC system has a simple payback ranging from 6.9 to 9.7 years. This already suggests there is a much greater benefit for small systems. Mr. Robinson notes that "[i]f a simple payback is less than the system life it suggests that the economics are favorable."[30] He also notes that "payback period

[30] See DESC Rebuttal Testimony (Robinson), at p.13.

is simple and intuitive, but does not capture the time value of money." Due to the time value of money, payback periods that approach the system life will not be a reasonable investment. I conclude that it is much more likely for small systems with simple paybacks under 10 years to have economic value to the customer, compared to larger systems with paybacks ranging from his 15-year to my 20-year estimates of simple paybacks. This conclusion is borne out by the analysis presented in Table 6 of my direct testimony, which showed increased bill savings for customers with smaller systems under the DESC Solar Choice tariff.

Q: DESC WITNESS MR. ROBINSON ARGUES YOUR CLAIM THAT SOLAR CHOICE ONLY BENEFITS LARGE WEALTHY CUSTOMERS REQUIRES MORE ANALYTICAL SUPPORT. DO YOU AGREE?

A: I disagree with Mr. Robinson's claim that it is only possible to analyze the impact for smaller size systems by having access to segmented customer load profiles with bins for adjusted income or appliance efficiency. As I demonstrated in my direct testimony, access to lower volumetric rates and a fixed subscription charge for 3 kW-DC of solar capacity, in combination, provide significant bill savings to large customers who install such small systems. In comparison, for larger solar systems, the increase in the subscription charge results in reduced bill savings that largely offset any benefit of additional solar output. For example, Table 6 of my direct testimony shows that a customer under the current NEM tariff can expect their overall bill savings to improve by $72 per month (from $43 to $115 per month) as the system size increases from 2.5 kW AC to 6.9 kW AC, but to improve by only $6 per month (from $46 to $52 per month) under DESC Solar Choice. An

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additional $6 per month, or $72 per year is unlikely justify the cost of almost tripling solar capacity. Analysis of different load shapes for the large customer is not required to verify this simple conclusion.

IV. CONCLUSION

Q: DOES THIS CONCLUDE YOUR TESTIMONY?

A: Yes, it does.

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BEFORE
THE PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

DOCKET NO. 2020-229-E

In the Matter of: Dominion Energy South Carolina, Incorporated's Establishment of a Solar Choice Metering Tariff Pursuant to S.C. Code Ann. Section 58-40-20 (See Docket No. 2019-182-E)	)))))))))))	**CERTIFICATE OF SERVICE**

I certify that the parties of record on the service list have been served with the Surrebuttal 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 either by electronic mail or by deposit in the U.S. Mail, postage prepaid:

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