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STATE OF SOUTH CAROLINA

BEFORE THE PUBLIC SERVICE COMMISSION

Docket No.: 2019-182-E

IN RE: South Carolina Energy Freedom Act (H.3659) Proceeding Initiated Pursuant to S.C. Code Ann. Section 58-40-20(C): 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	**DIRECT AND REBUTTAL TESTIMONY OF ALDER ENERGY SYSTEMS, LLC** (DON ZIMMERMAN, MS, MBA, NABCEP)

PREFATORY STATEMENT

Alder Energy Systems, LLC was permitted to intervene in the instant action by oral pronouncement of the South Carolina Public Service Commission ("Commission") during the Commission's business meeting agenda on October 28, 2020. The Commission confirmed its oral pronouncement by written order (Order 2020-726, the "Order") on the same day as the deadline for for rebuttal testimony under Order 2020-570. The Order permitting intervention allows Alder to "participate as a party of record" and makes no limitation on Alder's activity in this proceeding. The company therefore styles the instant testimony as direct and rebuttal and requests the Commission to accept the same as timely.

The company further reserves the right and hereby requests that the Commission permit it to amend its pre-filed testimony—in the event necessary—on grounds the testimony was prepared within merely hours of the Order of intervention.

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Q: WHO ARE YOU AND WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A: My name is Donald R. Zimmerman. I founded Alder Energy Systems, LLC during 2008 and am currently President / CEO of that organization. The company's address is 495 Jessen Lane, Charleston, SC 29492.

Alder Energy is a photovoltaic ("PV") solar developer and installer based out of Charleston, South Carolina. The company focuses on the design and installation of PV solar systems for distributed generation ("DG") by commercial and industrial customers (collectively, "C&I" or "nonresidential"). Alder has completed over five hundred DG solar projects in the southeastern United States and mid-Atlantic, ranging in capacity size from 2kW to 8MW. Alder performed the engineering, procurement and construction ("EPC") and development for South Carolina's first-ever solar farm (with others), located in Colleton County, and the EPC for the 8MW distributed PV system operated by the Volvo plant located in Ridgeville, Berkley County, South Carolina.

The purpose of my testimony is to assist the Public Service Commission of South Carolina (the "Commission") in establishing successor net energy metering ("NEM") policies for South Carolina's C&I ratepayers that comply the Energy Freedom Act ("A62").

Q: WHAT IS YOUR BACKGROUND?

A: I am an electrical engineer by trade, having earned: (1) a Bachelor of Science degree in electrical engineering from University of Michigan (1983), (2) a Master of Science degree in Optics from the University of Rochester (1986), and (3) a Master of Business Administration from Columbia University (2005). I have worked in the field of photonics for nearly three decades; hold seven patents; and have earned a Solar PV Installation Professional certification from the North American Board of Energy Practitioners (NABCEP) (2009). NABCEP certification is the hardest professional certification to achieve for EPC

solar contractors and requires intense rigor including requirements for: education, professional tenure, demonstrated projects, testing, and continuing education.

I have contributed to solar policy in South Carolina since participating in the initial negotiations and stakeholder meetings leading to passage of the Distributed Energy Resources Program Act ("A236"). Alder Energy is a member of the South Carolina Solar Council, the South Carolina Solar Business Alliance, Solar Energy Industries Association, and the Coalition for Community Solar Access. The company has maintained an active delegate in these organizations since 2011, 2012, 2016 and 2018, respectively, and participated in stakeholder meetings leading to the passage of A62.

I humbly offer my expertise to the Commission individually as an engineer, and in my capacity as President and founder of Alder Energy, understanding that I have not been formally trained on utility rate design but I have a thorough understanding of South Carolina NEM policies and their implementation.

Q: HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A: No.

Q: HAS ALDER ENERGY EVER INTERVENED IN A PROCEEDING BEFORE THE COMMISSION?

A: No.

Q: WHY DID ALDER ENERGY INTERVENE IN THIS PROCEEDING?

A: A62 was passed to ensure ratepayer access to solar energy in South Carolina. S.C. CODE ANN. § 58-41-40. The law requires the Commission to establish a 'solar choice metering tariff' to succeed NEM policies approved by the Commission under A236, giving express consideration to: (1) continuing private investment in "onsite" DG; (2) reducing regulatory and administrative burdens on the deployment of DG; and (3) avoiding disruption

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of "customer-scale" DG. S.C. CODE ANN. § 58-41-20(A). The law draws no distinction between NEM policies for residential and nonresidential customers and requires the Commission to establish a solar choice tariff without qualification or exclusion based on rate-class (ie, for both residential and nonresidential customers). The law further prohibits an act penalizing DG solar for customer-generators. *See* S.C. CODE ANN. § 58-40-20(G)(2).

Alder Energy intervened in this proceeding to protect the right of C&I customers to access solar solutions in South Carolina, as provided by A62. My testimony is intended to support that end by providing the Commission with the full range of data and perspectives arising from C&I participation in DG in the state. On information and belief, no other intervenor in this proceeding will actively represent the interests of C&I customers or otherwise offer testimony on their behalf.

Alder began installing behind-the-meter ("BTM") solar installations for residential customers prior to passage of A236. Alder since matured its market position and is currently one of (if not the) leading DG solar EPC contractor for nonresidential customers in South Carolina. Nearly all of Alder's current customers are C&I ratepayers investing in DG solar, with an average nameplate capacity system size of 114kW DC. Alder has completed approximately (80) behind-the-meter ("BTM") solar projects for nonresidential customers, the large majority of which have been in South Carolina.

C&I solar customers are like any other business enterprise—driven to achieve the shortest time horizon for the highest return on investment ("ROI"). Consequently, in over a decade of installing BTM solar in South Carolina, I have not encountered a nonresidential customer that would agree to participate in DG without the existence and implementation of NEM policies creating a financial payback within eight years. This timeframe sets the upper limits of acceptance; nonresidential customers prefer a range of four to seven years. This payback timeline in South Carolina has historically required a bill credit for surplus

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generation equal to a one-to-one ratio (ie, the ratepayer is credited the same rate as reflected on their bill) ("1:1").

The Commission's decision in this proceeding has the potential to disrupt or damage the DG solar market in South Carolina. Both results are prohibited by A62. Merely *maintaining* the existing scale of DG deployment for C&I customers in South Carolina, which is not sufficient under A62, will depend heavily on the Commission approving NEM terms that do not extent the payback horizon. My understanding of the market concludes that *expanding* the existing scale of DG deployment for C&I, which is required by A62, will be highly unlikely without the Commission's approval of 1:1 bill credit values for nonresidential customers.[1]

Q: WHAT DID YOU DO TO PREPARE FOR YOUR TESTIMONY?

A: I consulted with Alder Energy's counsel; reviewed company data; consulted with company executives; and reviewed the direct testimony filed by the utilities and intervenors in this proceeding. I also reviewed NEM pricing memorandums published by solar trade organizations.

Q: HOW SHOULD CUSTOMER-GENERATED SOLAR BE VALUED UNDER A62?

A: The Commission's careful consideration of evidence in this proceeding will reveal a means by which it can approve policies that support DG solar adoption in South Carolina for nonresidential customers <u>and</u> comply with A62's mandate to eliminate cost-shifting (<u>if</u> practicable).

The General Assembly did <u>not</u> prioritize any one purpose of A62's NEM provisions over the other. *See* S.C. CODE ANN. § 58-40-20(A)(1). To the contrary, the General

[1] This conclusion derives from boots-on-the-ground experience with C&I customers considering investing in DG solar; neither myself, nor Alder, conducted or caused to be conducted an empirical study.

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Assembly appears to have preferred expansion of customer-generated solar over cost-shifting considerations by enumerating more factors tending to grow DG penetration in South Carolina and less factors that would potentially limit growth (subsidy concerns).

1. Full Retail Bill Credit

Receiving full retail price value for customer-generated energy consumed BTM is a basic principal of solar rate design; it reflects customers' needs and right under A62 to reduce their consumption of electricity in a manner not different than efficiency, demand response and storage measures. Studies show that the benefits of DG are equal to or exceed the costs when DG penetration is low. A value of solar export rate should only be implemented when solar penetration is shown to have a material cost-shift on non-solar customers in the rate class.[2] The most fundamental way to ensure A62's express purpose of DG penetration in South Carolina is to maintain a 1:1 bill credit for South Carolina's C&I customers. In the event the Commission does not approve a 1:1 bill credit, other options exist, but may extent the critical payback horizon.

2. Other Options for Valuing Customer-Generated Solar

The 'Value of Net Energy Metering Methodology' approved by the Commission in Order 2015-194 (the "Methodology") has been acknowledged in this proceeding—by each utility and intervenors' testimony—as an appropriate model for measuring the value of customer-generated solar for purposes of A62. I do not dispute or oppose the Commission's use of the Methodology in this proceeding, but maintain that a 1:1 bill credit is appropriate under A62.

However, I do not accept, nor do I believe Alder's customers will accept, the utilities' position that the Commission should maintain zero dollar values in any of the (11)

[2] 'Principles for the Evolution of Net Energy Metering and Rate Design,' May 2017, https://www.seia.org/initiatives/principles-evolution-net-energy-metering-and-rate-design.

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Methodology components, much less the five components that have maintained zero dollar values since 2015 (ancillary services, avoided carbon dioxide emission cost, fuel hedge, transmission and distribution capacity and utility administration costs). I agree with other intervenors' position that all Methodology components should each have a reasonable cost or benefit calculation in order for the value of customer-generated solar energy to be measured as prescribed by A62.

I believe intervenor witness R. Thomas Beach[3] is correct when testifying:

> If there is uncertainty about the magnitude of a specific benefit or cost, the default should not be to assign a zero value to that benefit or cost. Instead, the Commission should establish a reasonable value for the benefit or cost based on an examination of several cases that span a reasonable range of values for such a benefit or cost.

(Doc. ID 294651 at 9, docket 2019-182-E.) This Commission should affirmatively value ancillary services, avoided carbon dioxide emission cost, fuel hedge, transmission and distribution capacity and utility administration costs to achieve an accurate value of customer-generated solar.

Alder Energy's nonresidential customers in South Carolina include: small businesses, commercial real estate owner-developers, manufacturing plants and municipalities and other nontaxable entities like school and hospitals. These customers invest in DG solar for a variety of reasons, including, a desire to: decrease operating expense, reduce use of carbon-based fuels, meet corporate sustainability goals, increase resiliency, and mitigate environmental health issues. By allocating non-zero benefits or costs to <u>all</u> components of the Methodology's value stack, the Commission can promote investment confidence by customer-generators. These businesses ascribe value to many of the components that have

[3] Beach testified for Intervenors South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, Upstate Forever, Vote Solar, Solar Energy Industries Association, and the North Carolina Sustainable Energy Association.

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been unfulfilled to date and increasing investment confidence in customer-generated solar is expressly supported by A62. *See* S.C. CODE ANN. § 58-40-20(A)(1).

Q: DO YOU SUPPORT DUKE ENERGY'S PROPOSED SETTLEMENT WITH VARIOUS INTERVENORS IN THIS PROCEEDING?

A: Alder Energy was not invited to attend stakeholder meetings and negotiations preceding the proposed settlement between Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (collectively "Duke Energy") and various intervenors, including Sunrun Inc. The first time Alder Energy learned of the meetings was when the parties published various press releases relative to the proposed settlement. On information and belief, no one discussed C&I solar successor rates, despite DG being equally as important to South Carolina's nonresidential customers (if not more important). It is possible Alder would not be an intervenor in this proceeding had it been given the opportunity to participate in those discussions.

I have considerable concerns regarding the ambiguity of the proposed settlement as it applies to NEM for South Carolina C&I customers (among other issues). The sum total acknowledgment of nonresidential NEM in the proposed settlement terms suggests Duke Energy intends to attach a NEM *rider* to a participating C&I customer's existing rate schedule(s). That is incongruous with the proposed settlement's treatment of NEM for residential customers. For that rate class, the settlement proposes an entirely new *tariff*—the 'Solar Choice Metering Tariff' required by S.C. CODE ANN. § 58-40-20(F).[4]

A62's NEM provisions make no distinction between rate classes. There is no direction from A62—or even suggestion for that matter—that would preclude C&I customers' from enjoying a 'Solar Choice Tariff' (on similar or even other terms). I

[4] The proposed settlement terms do not explain the basis for the disparate treatment between residential and nonresidential customers.

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acknowledge a NEM rider could ultimately benefit South Carolina's nonresidential DG investors, but cannot comment without details, which are not present in the proposed terms.

Q: ARE YOU CRITICAL OF THE UTILITIES' PRE-FILED TESTIMONY IN THIS PROCEEDING?

A: The utilities' testimony forecasts the ten-year adoption and deployment of DG solar in South Carolina and either avoids projecting nonresidential DG or otherwise includes incorrect assumptions for nonresidential DG. This approach does not comply with A62, which specifically contemplates nonresidential customers as being a part of customer-generation for purposes of NEM. S.C. CODE ANN. § 58-40-10(C)(2)(a). This is particularly concerning for purposes of this proceeding because the level of penetration of DG, whether residential or nonresidential, is a core function of the cost/benefit analysis mandated by A62.

1. <u>Duke Energy's Testimony</u>

Duke Energy's forecasts model an 8kW PV system, <u>exclusively</u>. That system size fails to consider nonresidential DG, which ranges in system size from 20kW to 1,000kW. That range is prescribed by A62's definitions for nonresidential customer-generation. For reference, and as I previously testified, Alder's average system size for nonresidential customers is 114kW DC. Duke Energy's pre-filed testimony (and the proposed settlement) suggest it does not intend this Commission to address NEM for C&I customers.

Additionally, Duke Energy's forecast does not clarify what is considered an acceptable timeline for the "simple payback" model (how a NEM customer can generate ROI). As I previously testified, C&I customers generally will not invest in DG solar unless they model a financial payment occurring between four and seven years. It is unclear whether Duke Energy's model makes this distinction for nonresidential DG and it should.

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2. Dominion Energy South Carolina's Testimony

Conversely, DESC's ten-year forecast considers nonresidential DG, but all of the projected growth scenarios ("Low-Cost", "Mid-Cost", and "High-Cost") presume existing NEM values continue uninterrupted at the 1:1 bill credit. Surely DESC understands A62 requires a successor tariff that contemplates ending cost-shifting (if any) and that the Commission may adopt a value of customer-generated solar that reduces the existing 1:1 bill credit. The Mid-Cost and Low-Cost projections for the Small, Medium, and Large Commercial markets all show no or very little new solar adoption, even with the assumption that NEM continues at the 1:1 bill credit. If the 'Solar Choice Tariff' integrates a value of solar that is less than retail rates, then the projections indicate a contracted market for C&I DG—an event prohibited by A62.

Further, DESC's conclusion that the "Other Commercial" sector—which includes nontaxable entities such as churches, schools, and municipalities—should see stronger growth from "more attractive economics," fails to address that these entities do not pay income tax. These entities cannot utilize the federal or state solar investment tax credits. Additionally, a lessor that offers to finance such a project for a nontaxable entity in South Carolina cannot enjoy the investment tax credit, which effectively precludes solar adoption for nontaxable entities. Allowing third-party PPAs for nontaxable entities in South Carolina would remove this barrier to entry, with zero additional costs to anyone.

Q: WHAT HURDLES EXIST IN SOUTH CAROLINA FOR ADOPTION OF NONRESIDENTIAL CUSTOMER-GENERATED SOLAR?

A: **1. No Financing for Nontaxable Entities**

South Carolina solar leases do not allow anyone, customer or lender, to take the federal or state income tax credits for solar when the customer-generator is a nontaxable

entity. Therefore, finding viable solar financing options for nontaxable entities is difficult and rare. Allowing third party-owned PPAs for nontaxable customers would provide an attractive financing option for this sector of the marketplace because the federal and state tax credits could be utilized by the financier in a PPA scenario. Most of the past growth to this sector occurred during a short period, when DESC offered the Bill Credit Agreement program. Otherwise, forecasts project little foreseeable growth for a sector that includes: municipalities, schools, churches and charitable entities—which form a vibrant sector of solar marketplaces in other states and could benefit from the economic, social, and environmental attributes of solar.

2. "Solar Holdout" discrimination in DESC's interconnection application process.

DESC reserves capacity on every substation for solar systems sized 20kW AC and smaller. This is reserved capacity is also known as the "Solar Holdout." This reserved capacity/solar holdout is 500kW per phase per circuit. Once solar generation capacity for a substation reaches the substation's estimated minimum daylight load, the solar customer must pay the utility to add reverse flow protective equipment to the substation. Frequently, the "Solar Holdout" exceeds the estimated minimum midday peak; therefore, no customer-generators desiring to build solar systems larger than 20kW are allowed, without having to pay for utility improvements.

The cost of such improvements is too high for all but the largest solar system investments to bear. Thus, the customer generation systems do not get built. In many cases, the substation's solar holdout amount for 20kW and smaller customer generators exceeds the number of residential and small commercial customers connected to the substation lines, who would reasonably be expected to install solar. This reserve capacity discrimination commonly causes C&I customers to cancel projects or reduce their system sizes to the 20kW

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size (much less than their annual energy consumption justifies), in order to gain approval to interconnect without having to pay unnecessary grid improvement costs. This methodology needs improvement. I acknowledge this is an issue that may be addressed in the queue reform/interconnection docket; however, A62 demands that I inform the Commission of this regulatory burden restricting penetration of C&I solar.

3. System Size Limitation by Contract Demand

C&I customers often desire to reach close to 100% energy offset from a new DG solar asset. In most instances, due to the utilities' current interpretation of contract demand restrictions, it is not possible to achieve anywhere near 100% offset, as intended in A62. *See* S.C. CODE ANN. § 58-40-10(C)(5) (noting offset of "all of the customer-generator's own electrical energy requirements").

Earlier this year Alder Energy designed DG solar proposals for a business located in Duke Energy Carolinas, LLC's territory. The customer sought to offset most, if not all, of its energy against its large commercial rate. The customer has very consistent energy use throughout each day, with no high peaks in power demand. Therefore, its demand charges remain relatively low, as do its contract demand, which reflects its annual peak demand.

S.C. CODE ANN. § 58-40-10(C) defines "customer-generator" as having an electrical generating system with a capacity of: "(a) not more than the lesser of one thousand kilowatts (1,000 kW AC) or one hundred percent of contract demand if a nonresidential customer; or (b) not more than twenty kilowatts (20kW AC) if a residential customer." Duke Energy interprets the "contract demand" solar system capacity limitation as equal to the customer's annual peak power use. Therefore, in this customer's case, the largest solar system Alder could propose and the customer could consider was a 216kW AC (315kW DC) ground mounted array. This solar system was projected to produce enough energy to offset only

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38% of the customer's annual energy use, yet it is the largest system allowed by the utility's interpretation of the contract demand capacity limitation.

In order for the customer to meet its goal to offset most or all of the customer's electrical energy requirements, a 600kW AC (792kW DC) system was required. This is ~277% larger than allowed under the current interpretation of contract demand. Ultimately, the customer chose not to invest in a solar installation for its business because the system size limitations would not allow it to get closer to 100% offset.

This is a nearly universal occurrence when designing solar systems for customers with consistent energy use; the current interpretation of contract demand limitation artificially diminishes the nonresidential customer's allowed solar system size. The contract demand capacity limitation almost never allows the C&I customer to offset "all" of its energy requirements and penalizes the customer for striving to produce higher amounts energy to be consumed behind the meter—an event precluded by A62. *See* S.C. CODE ANN. §§ 58-40-20(G)(2) and 58-40-10(C)(5).

C&I customers do not seek to "oversize" systems, purposefully generating substantially more energy than they annually consume, but they universally seek to offset as much energy as possible. The contract demand limitation as applied is inconsistent with the intent and fair interpretation of A62.

The benefits of solar are measured in energy (kWh) generation. It offsets a customer's energy use, and is recognized to have limited, unreliable ability to reduce a customer's peak demand, which may occur on a rainy day or winter morning, when solar energy output is diminished. Since the value of solar is an energy rate, and customer-generators intend to primarily offset the customer-generator's own energy requirements, an interpretation of "contract demand" that is based upon a customer's <u>historic, measurable annual energy</u> use will allow all but the largest nonresidential ratepayers to achieve

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significant, if not total energy offset, which aligns with the intent of A62 and the clean energy goals of businesses. In contrast, residential systems are capped at 20kW AC only, which would provide up to (100%) of the energy required for all but the largest of homes without other limitations.

4. Demand Rates for Nonresidential Customers

Commercial and industrial demand charges are a significant obstacle for wide-spread DG solar adoption. Customer-generated solar, without battery storage, offers little or no reliable reduction in customer's peak demand costs. Utilities base demand charges on the 30-minute or 1-hour of peak power use during the billing period, and if that moment occurs when the solar system is not generating energy, then the peak demand remains unaffected. C&I customer generators should have an optional, all energy, Time-of-Use rate that allows customer-generators the right to offset "part or all of the customer-generator's own electrical energy requirements." S.C. CODE ANN. § 58-40-10(C)(5).

The existing demand charges should be converted to peak energy rates. The customer generator will no longer be penalized by the restrictive contract demand limitation, and instead have the ability to size its solar energy system based on the customer's annual energy consumption, and be able to offset part or all of its energy-based costs. In addition, by offering rates with pre-defined peak periods, it allows customers to better manage their consumption and opens the door for storage solutions to minimize peak consumption.

Q: DOES THAT CONCLUDE YOUR TESTIMONY?

A: Yes.

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