BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA
UTILITIES COMMISSION

DOCKET NO. 2014-246-E

In Re: Petition to Establish	)	
Generic Proceeding Pursuant to the	)	
Distributed Energy Resource	)	**DIRECT TESTIMONY OF**
Program Act,	)	**JUSTIN R. BARNES ON BEHALF**
Act No. 236 of 2014,	)	**OF THE ALLIANCE FOR**
Ratification No. 241,	)	**SOLAR CHOICE**
Senate Bill No. 1189	)	

December 11, 2014

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Exhibit JRB-1

I. Introduction

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND CURRENT POSITION.

A. Justin R. Barnes, 401 Harrison Oaks Blvd Suite 100, Cary, North Carolina, 27513. My current position is Senior Research Analyst with EQ Research LLC.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of The Alliance for Solar Choice ("TASC").

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND OCCUPATIONAL BACKGROUND.

A. I obtained a Bachelor of Science in Geography from the University of Oklahoma in 2003 and a Master of Science in Environmental Policy from Michigan Technological University in 2006. I was employed at the North Carolina Solar Center at N.C. State University for more than five years, where I worked on the *Database of State Incentives for Renewables and Efficiency (DSIRE)* project, and several other projects related to state renewable energy and efficiency policy. In my current position at EQ Research, I manage and perform research for a solar regulatory policy tracking service, contribute as a researcher to standard policy service offerings, and perform customized research. My *curriculum vitae* is attached as **Exhibit JRB-1**.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide a general overview of net metering policy nationally and to provide background on the evolution of the policy in South Carolina, in particular. I also provide observations about regulatory proceedings from around the country that have tackled similar issues that are being contemplated here, as the Commission considers both the methodology and the form of net metering rates or tariffs.

II. National Net Metering Policy

Q. WHAT IS NET METERING?

A. The precise definition of net metering has been stated in a variety of different ways in different forums. Though the terminology used from place to place may differ, the definitions consistently define an arrangement where a customer is permitted to self-supply his or her electricity needs with a generation system installed on the customer side of the utility meter, and offset electricity delivered from a utility with electricity delivered to the utility during a billing period. Thus, the customer's monthly bill reflects on the net amount of usage during the billing period, as electric deliveries to and from the customer offset one another at a 1:1 ratio. This is often visualized as a customer's electric meter running backwards during times when the customer is delivering electricity to the utility, and vice versa.

Q. HOW HAS NET METERING BEEN DEFINED AT THE FEDERAL LEVEL?

A. While net metering policies are determined at the state level, the term "net metering" has been defined or described on multiple occasions at the federal level. Section 1251 of the federal Energy Policy Act of 2005 ("EPAct of 2005") provided the following definition of net metering, which has been referenced in many states, including South Carolina, in regulatory proceedings on the topic.

> …the term 'net metering service' means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.

The Federal Energy Regulatory Commission ("FERC") has likewise provided a description of net metering on more than one occasion. For instance, in a 2001 decision on whether the net metering rules adopted by the Iowa Utilities Board were preempted by federal law, the FERC affirmed its prior decisions finding that the practice of netting customer usage over a time period did not constitute a sale of electricity, and that the typical monthly billing cycle for retail customers was a reasonable time period for the measurement.[1]

In addition, in Order 2003-A establishing small generator interconnection procedures, the FERC described net metering in the following manner:

> Essentially, the electric meter "runs backwards" during the portion of the billing cycle when the load produces more power that it needs, and runs normally when the load takes electricity off the system.[2]

Q. YOU NOTED THAT NET METERING POLICIES ARE PRESENTLY DETERMINED BY STATES. HOW MANY STATES CURRENTLY HAVE NET METERING POLICIES IN PLACE?

A. Net metering is mandated by statute or regulation in 44 states, plus the District of Columbia. States vary in the approaches they have taken to implement net metering, however. Generally speaking, the states with higher penetrations of distributed solar have continually revised their net metering policies and regulations to ensure they do not penalize customer-generators for offsetting their energy use.

Q. PLEASE DESCRIBE SOME OF THE VARIATIONS THAT EXIST IN STATE NET METERING POLICIES.

A. The differences in state net metering policies are numerous. They include, but are not limited to, aspects such as eligible resources/technologies; eligible

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[1] *MidAmerican*, 94 FERC ¶ 61,340, at 62,262-64 (2001).
[2] *Standardization of Generator Interconnection Agreements and Procedures*, Order No. 2003-A, FERC Stats. & Regs. ¶ 31,160 at P 744.

customer classes; system sizes limits; aggregate participation limits; the treatment of monthly and annual net excess generation (rollover); customer protections against additional fees; and renewable energy credit ownership. [3]

Q. HOW DO STATES DIFFER IN TERMS OF TREATING MONTHLY NET EXCESS GENERATION ("NEG") OR ROLLOVER?

A. Most net-metering policies allow customers to carry NEG forward to the following month on a kilowatt-hour (kWh) basis for up to 12 months. The large majority (35 states) take this approach, which I will refer to here as "true" or "full retail" net metering. Nine states take a more restrictive view of net metering, requiring utilities to reconcile net metering accounts each month, with any excess generation paid out at a wholesale rate.

Q. WHY ARE THE MONTHLY ROLLOVER PROVISIONS IMPORTANT?

A. Customer energy usage patterns and distributed generation production profiles vary from month to month, the result being that a customer production will almost certainly not match usage in any given month. Some months, accounting for seasonal variations in weather and system production, tend to consistently show larger differences than others. Monthly kWh rollover allows a net metering customer to appropriately size his or her system to match annual

[3] For more information, the Freeing the Grid project grades states' net metering and interconnection policies based on their transparency, accessibility and consistency. Freeing the Grid's scoring mechanism is detailed in the *Freeing the Grid 2014 Best Practices in State Net Metering and Interconnection* report, found on its website (available at www.freeingthegrid.org). The report contains an explanation of the scoring system as it relates to the state policy variations identified above. It also contains an index of all state scores in Appendix A.

consumption, effectively extending the netting period to an annual, or in some cases indefinite, time frame. This enables the customer to pursue full self-supply of on-site energy consumption on an annual basis without being subject to a possible diminishment of the value of his or her on-site energy production from month to month.

Q. HAS THIS ASPECT OF POLICY HAD AN IMPACT ON NET METERING PARTICIPATION IN SOUTH CAROLINA?

A. It is difficult to attribute causation to any specific element of net metering policy or change thereto, as many factors go into a consumer's choice to install distributed generation. However, the net metering reports provided by individual utilities are suggestive. In their 2009 reports, utilities identified a total of 38 net metering customers, while in their 2013 reports that number had increased to 298 customers. This seems to indicate that on-site generation and net metering has become increasingly attractive to customers and it is reasonable to think that part of this is due to changes in the terms of the programs themselves.

Q. WHAT CAN YOU CONCLUDE ABOUT HOW STATES HAVE DEFINED NET METERING BASED ON THEIR IMPLEMENTATION PRACTICES?

A. First and foremost, states have defined net metering to refer to a billing practice that involves the netting of electricity deliveries to and from the utility over a period of at least one month. Significantly, 80% of states with a net metering policy allow full "retail net metering", which permits a customer to carry over excess generation from month to month to offset consumption of kWhs in a future month at a 1:1 ratio.

III. South Carolina's Net Metering Policy

Q. PLEASE BRIEFLY SUMMARIZE THE ORIGINS OF SOUTH CAROLINA'S NET METERING POLICY.

A. Net metering in South Carolina originated in response to the provisions of Section 1251 of the federal EPAct of 2005, which among other things required state regulatory commissions to consider the adoption of net metering requirements for utilities that they regulate. The proceeding commenced in 2006 in Docket No. 2005-385-E and after multiple rounds of comments and hearings, the Commission issued Order No. 2008-0416 in June 2008 approving the adoption of utility tariffs to implement the new program. The June 2008 adoption order further provided for a review of the net metering program in roughly 12 months time.

Q. HAVE ANY DEFINITIONS OR DESCRIPTIONS OF THE TERM "NET METERING" BEEN INTRODUCED IN PREVIOUS REGULATORY PROCEEDINGS IN SOUTH CAROLINA?

A. Yes. Since South Carolina's net metering programs originated in response to the EPAct of 2005, the definition contained in Section 1251 formed the initial foundation of Commission discussions on the matter. This basis has been refined and elaborated upon over time as the state's net metering program has evolved. For its part, in 2007 testimony the Office of Regulatory Staff (ORS) has described net metering as follows:

> Generally, in a net metering program, the IOU allows a customer's meter to run in reverse if the electricity the customer generates is more than the customer is consuming. Generally speaking, at the end of the billing period, the customer only pays for his or her net consumption, which is the amount of resources consumed, minus the amount of resources generated.[4]

As described in more detail below, the associated utility programs have not historically been entirely consistent with this description. However, South Carolina's net metering program has changed over time to become more uniform from utility to utility, and each utility now offers a net metering arrangement that corresponds to the generally accepted definition of the term.

Q. UNDER WHAT TERMS DID NET METERING BECOME AVAILABLE TO ELECTRICITY CUSTOMERS IN SOUTH CAROLINA?

A. Pursuant to the Commission's June 2008 order, net metering became available to customers on July 1, 2008. Each utility initially offered two distinct rate riders for small customer generators. One rider was typically termed a "net metering" rider, and was only available to customers on time-of-use rate schedules with demand rate components. As written, these collective riders allowed any excess energy delivered to the utility at any point in time to reduce the amount of billed on-peak and off-peak usage, with any net excess during a

[4] Docket No. 2005-385-E, Direct Testimony and Exhibits of A. Randy Watts, p. 6 at lines 10-14 (April 10, 2007).

monthly period being carried forward to the following month. Thus in effect, the customer's bill reflected only net consumption during the billing period, and excess in one month could offset net consumption during the next month at a 1:1 ratio.

Each utility also offered a second rider, sometimes termed the "flat-rate" option, which did not require customers to enroll in a time-of-use demand rate schedule and instead allowed them to remain on any existing rate schedule for which they were eligible. Under this rider, customers were permitted to self-supply their on-site energy needs, but were credited for excess generation delivered to the utility at any given time at a time differentiated avoided cost rate. Each utility tariff within this category contained an additional monthly fee, and in the case of Duke Energy, a monthly standby charge based on the nameplate rating of the customer's on-site generation system.

Q. ARE BOTH OF THESE ARRANGEMENTS CONSIDERED TO BE "NET METERING" UNDER GENERALLY ACCEPTED DEFINITIONS OF THE TERM?

A. No. The first set of tariffs referenced above, applicable to customers on a time-of-use demand rate, do meet the definition of net metering as the term is commonly understood, though most states do not limit the choice of rate schedules available to net metering customers, and in fact some states expressly forbid such a requirement in their net metering laws. However, based on billing examples provided to the South Carolina Energy Office and contained in its report entitled *Net Metering in South Carolina: Current Status* *and Recommendations*, in at least one case (Progress Energy) it appears that true netting arrangement was not implemented in practice at that time.

As is evident in the examples provided by Progress and found in Appendix H of the report, a customer on the time-of-use demand rate could have both a non-zero amount of net billed usage, and excess generation for the same on-peak or off-peak time period within a single billing period. In any net metering program, there can be no *excess generation* during a time period unless the net consumption for the same period has already been reduced to zero. Otherwise, there has been no *netting* of *metered* consumption and the customer is not *net metered*. On the other hand, Duke Energy's billing examples, found in Appendix G, and the Energy Office's recommended net metering structure do represent a net metering arrangement.[5]

The second set of tariffs defining the "flat rate" option do not represent net metering as the term is commonly used and implemented because there is no "netting" of metered consumption and deliveries to the utility within a billing period. As previously implemented, the Progress Energy time-of-use net metering rate option fell into this category as well.

Q. PLEASE DESCRIBE HOW NET METERING HAS EVOLVED IN SOUTH CAROLINA SINCE THE INITIAL ADOPTION OF NET

[5] The billing examples referenced above are indicated in the report as those applicable to "TOUD" customers in the respective appendices (Appendix H for Progress Energy and Appendix G for Duke Energy). They do not refer to the identified "Flat Rate" options, which in neither case represent net metering. The referenced report is available at: (http://www.energy.sc.gov/utilities/metering).

METERING TARIFFS IN 2008.

A. The most significant changes to net metering since 2008 occurred with the adoption Order 2009-552 in August 2009 (Docket No. 2005-385-E), which approved a Settlement in connection with the Commission's 12-month review of utility's net metering programs. The Settlement was based on the recommendations contained in above referenced report from the South Carolina Energy Office. Among other things, it provided a modification to the "flat rate" option for residential customers to offer retail crediting of excess generation credits; eliminated residential standby charges; and allowed net metering generators to retain ownership of renewable energy credits (RECs) until such a time as a REC market was fully developed. In effect, the settlement revised the residential "flat rate" option such that it became consistent with net metering as the term is commonly understood, while also making the arrangement more favorable for customers in several other ways and providing greater standardization among utilities. Since the 2009 settlement, only minor changes to utility net metering tariffs have been authorized, in both cases related to the date for annual customer account resets.

Q. BASED ON THE PRECEDING DISCUSSION, WHAT CAN WE CONCLUDE ABOUT HOW THE TERM "NET METERING" HAS COME TO BE DEFINED IN SOUTH CAROLINA?

A. Stated simply, we can say that since 2009 South Carolina has had a uniform definition of net metering that is consistent with how the term is commonly understood at the federal, state, and utility level throughout the country. More specifically, it has recognized that net metering involves a customer's self supply of electricity (i.e., not a buy-all, sell-all arrangement), where incidental deliveries of electricity between the customer and the utility during a billing period are accounted for by netting one against the other at a 1:1 ratio. Further, it has adopted a form of net metering sometimes referred to as "retail net metering", that allows net excess during one month to offset net consumption during future months at the same 1:1 ratio.

IV. Current Trends in Net Metering Policy

Q. ARE THERE ANY TRENDS THAT YOU HAVE SEEN IN THE EVOLUTION OF NET METERING POLICIES IN RECENT YEARS?

A. If one were to look at the individual components of state net metering policies, it is likely that a number of trends would be apparent. However, the most prominent trend is increasing scrutiny of whether, and to what degree, net metering allows participating customers to avoid paying for grid infrastructure costs, reducing utility collections of these costs and shifting the burdens of payment to customers that do not participate in net metering. This effect is most often termed the "cost-shift" or "cross-subsidy" issue. While this potential problem has been frequently raised ever since the advent of net metering, it has garnered increasing attention during the last several years as the number of net metering customers has increased.

Q. HOW HAVE STATES RESPONDED TO THIS POTENTIAL ISSUE?

A. Not all states have undertaken any specific action, but where movement on the issue has taken place, the response has most often been to convene a regulatory proceeding to investigate the costs and benefits of net metering, or in some cases distributed generation in general. The general focus has been on undertaking an analysis to discover whether the costs outweigh the benefits. Stated another way, the purpose has to been to diagnose whether a problem actually exists, or may exist in the future.

Q. IN WHICH STATES HAVE FORMAL PROCEEDINGS BEEN ESTABLISHED TO STUDY THE COSTS AND BENEFITS OF NET METERING OR DISTRIBUTED GENERATION?

A. I am aware of continuing or completed proceedings of this type in the states listed below.

- Arizona
- California
- Colorado
- Louisiana
- Maine
- Mississippi
- Nevada
- New York
- Utah
- Vermont
- Washington

Q. WHAT TYPES OF OUTCOMES FROM THESE INVESTIGATIONS?

A. In Arizona, Colorado, Maine, New York, Utah and Washington, the proceedings are ongoing and as yet have not resulted in the completion of a formal study. Studies have been completed in California, Mississippi, Nevada and Vermont, while in Louisiana an outside contractor has been selected to perform a formal study, but the results are not yet available.

Regulatory commissions in California, Nevada and Vermont have also instituted proceedings to further investigate potential future changes to net metering and/or overall rate design. The extended Nevada and Vermont proceedings are currently in their very early stages. I describe the California discussions, which are somewhat more advanced, later in my testimony.

Q. HAVE ANY OF THESE STATES ACTUALLY MADE CHANGES TO NET METERING AS A RESULT OF THEIR STUDIES, SUCH AS PRESCRIBING ADDITIONAL CHARGES ON NET METERING CUSTOMERS?

A. No. As I describe in more detail later, though Arizona has approved the establishment of a small additional monthly charge on some residential customers of Arizona Public Service ("APS"), it actually did so *prior to* convening a formal proceeding to study the issue. The current study proceeding stems from the considering disputes which arose during the proceeding on the monthly charge.

Q. ARE THERE OTHER RECENT EXAMPLES OF FORMAL PROCEEDINGS WHERE THE ISSUE OF INFRASTRUCTURE COST RECOVERY AND ADDITIONAL CHARGES ON NET METERING CUSTOMERS HAS BEEN RAISED?

A. Yes. Utilities in Maine, South Dakota[6], Utah, Virginia and Wisconsin have made proposals to impose additional charges on some or all distributed generation customers as part of general rate case proceedings. In addition, utilities in Arizona, Idaho and Virginia have proposed rate changes purported to address the issue outside of rate case proceedings.

Q. HAVE CHANGES TO NET METERING ARISEN FROM ANY OF THESE PROCEEDINGS?

A. Yes, though only in a limited number of cases. As noted above, one utility in Arizona has been permitted to levy an additional charge on some residential net metering customers, while in Virginia, the state's two largest utilities, Dominion Virginia and Appalachian Power, have been permitted to levy standby charges on a small subset of net metering customers.

In two other cases, Utah and Idaho, regulators declined to allow the new charges, reasoning that the available evidence was insufficient to justify such a decision. The Utah cost-benefit investigation referenced above was established as a direct result of this decision. I elaborate on the Arizona, Utah and Virginia examples later in my testimony.

In the Maine and South Dakota cases, the proposals were ultimately voluntarily withdrawn by the utility, while in the Wisconsin case, a formal

[6] The South Dakota example, a proposal brought forth by Black Hills Power Inc., would have required residential customers with on-site generation to enroll in a demand rate, rather than impose an additional surcharge. South Dakota does not actually have a statewide net metering policy, nor does Black Hills Power offer such a program.

decision has not yet been issued.

Q. WHAT DEGREE OF DISCRETION DO STATE REGULATORY COMMISSIONS HAVE WITH RESPECT TO RATEMAKING DECISIONS THAT AFFECT NET METERING CUSTOMERS?

A. It varies from state to state. Some net metering laws, including but not limited to those in California, Delaware, Kentucky, Missouri, Nevada, New Jersey, Ohio and Vermont, have so-called "safe harbor" clauses that protect customers from additional charges that do not apply to all customers. In some cases, these clauses also require that net metering customers have the same choice of rate schedules available to all other customers within the same customer class (e.g., tariffs may not require the customer to enroll in a demand rate). In at least seven states, the Commission currently has the discretion to establish additional charges specifically on net metering customers, but is not permitted to do so without first evaluating the costs and benefits of the net metering program. Four of these seven states, Arizona, Louisiana, Utah and Washington, are represented in the list of states that have convened cost-benefit investigations.

Q. DOES SOUTH CAROLINA'S NET METERING POLICY CONTAIN ANY LIMITATIONS OF THIS TYPE?

A. Historically it did not, because prior to the enactment of S.B. 1189 in 2013, there was no statutory basis for net metering in South Carolina. The Commission was therefore unencumbered by any constraints as it developed and modified the program, though as previously noted, it eventually elected to eliminate standby charges on residential customers and allow them to net metering on either flat rate or time-of-use demand rate schedules. With the enactment of S.B. 1189, South Carolina now constitutes one of the seven states that grant the Commission discretion on the imposition of any additional charges or credits, but only after a cost-benefit evaluation.

Q. IN YOUR PRIOR TESTIMONY, YOU INDICATED THAT YOU WOULD ELABORATE ON THE DETAILS OF SEVERAL RECENT PROCEEDINGS INVOLVING NET METERING AND RATE DESIGN ISSUES. PLEASE REPRISE THAT LIST OF STATES AND WHY YOU WOULD LIKE TO DISCUSS THEM IN FURTHER DETAIL.

A. I would like to provide further details on proceedings in Arizona, Utah and Virginia because they are all states where the prospect of additional charges on net metering customers has been considered by a Commission and achieved at least some temporary resolution. An understanding of the finer elements of these cases and their outcomes is important when considering "trends" on the issue of regulatory consideration of purported net metering cost-shifts. More specifically, they contradict any assertion that recent Commission decisions on the matter display a trend towards broadly instituting additional charges on net metering customers, and that the charges which have been imposed are based on a full evaluation of net metering costs and benefits. I mention California because it has conducted extensive study and stakeholder consultation on these related matters, in large part due to the fact that it has been and remains the single largest market for residential solar.[7]

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN UTAH.

A. In January 2014 Rocky Mountain Power (referred to as "RMP" or "PacifiCorp") filed a general rate case application, which among other things proposed to institute a fixed facilities charge of $4.25 per month on residential net metering customers. As the case went through settlement proceedings, RMP increased its requested net metering facilities charge to $4.65 per month.[8]

Q. WHAT WAS THE OUTCOME OF THE PROCEEDING?

A. As previously noted, Utah is one of a number of states where such a charge may only be instituted if it can be determined that the costs of the net metering program exceed the benefits. In analyzing RMP's proposal in light of this requirement, the Commission found that the evidence was insufficient to justify an additional charge or additional credit. Thus in its August 2014 final order on the matter, it declined to allow the utility to institute the proposed

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[7] See for example *U.S. Solar Market Trends 2013* published by the Interstate Renewable Energy Council (http://www.irecusa.org/publications/). As indicated in Appendix C, during 2013 more than 45% of all of the residential solar PV installed in the U.S. was in California, and California installed almost four times as much residential solar PV as the next most prolific state.

[8] The utility's application was docketed in 2013 upon the filing of its Notice of Intent in Utah PSC Docket No. 13-035-184, *In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations*, available on line at: (http://www.psc.state.ut.us/utilities/electric/elecindx/2013/13035184indx.html).

charge, and elected to establish a new proceeding to investigate the costs and benefits of the utility's net metering program in a more comprehensive manner. Among the tasks to be completed as part of this investigation is a load research study of residential net metering customers. The excerpt below from the August 2014 Report and Order is a representative, though not comprehensive, sample of the Commission's analysis and conclusions on the matter.

> Based on our review of the record in this proceeding, we conclude the evidence is inconclusive, insufficient, and inadequate to make a determination under Utah Code Ann. § 54-15-105.1(1) whether costs PacifiCorp or its customers will incur from the net metering program will exceed the benefits of the net metering program, or whether the benefits of the net metering program will exceed the costs. Thus, we cannot conclude that the proposed net metering facilities charge is just and reasonable under Utah Code Ann. § 54-15-105.1(2), and we decline to approve the charge at this time.
>
> We recognize PacifiCorp's electric system is undergoing transformation as it integrates customer-owned generation, and that this integration has cost implications. Although there is insufficient evidence to make the determinations required in Utah Code Ann. § 54-15-105.1 in this proceeding, we

acknowledge PacifiCorp, the Division and the Office have raised important issues regarding the potential for cost shifting from net metered customers to PacifiCorp's general body of customers. We also recognize other parties have provided at least some evidence of a range of asserted benefits to the system and ratepayers from residential rooftop solar generation. We feel strongly that the questions these positions raise should be thoroughly examined based on the appropriate data and analysis pertaining to the full array of relevant, measurable costs and benefits…

We emphasize that ratemaking is a dynamic process and must respond appropriately as the demands customers place on the utility system change. Prior to approving responsive new rate structures, we must understand these changes. For example, if net metered customers are a subclass (as PacifiCorp asserts), data must confirm this assertion. We cannot determine from the record in this proceeding that this group of customers is distinguishable on a cost of service basis from the general body of residential customers. Simply using less energy than average, but about the same amount as the most typical of PacifiCorp's residential customers, is not sufficient justification for imposing a charge, as there will always be customers who are below and above average in any class. Such is the nature of an average. In this instance, if we are to implement a facilities charge or a new rate design, we must understand the usage characteristics, e.g., the load profile, load factor, and contribution to relevant peak demand, of the net metered subgroup of residential customers. We must have evidence showing the impact this demand profile has on the cost to serve them, in order to understand the system costs caused by these customers. This type of analysis is a necessary part of determining the relationship of costs and benefits of the net metering program as required by the Net Metering Code.[9]

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN ARIZONA.

A. In July 2013 the Arizona Corporation Commission (ACC) opened a proceeding to address a proposal by the Arizona Public Service Company (APS) for approval of a "Net Metering Cost Shift Solution" applicable to the residential sector. The proceeding stemmed from discussions and debates that took place in earlier formal and informal settings as to the existence and magnitude of any cost shifts between net metering participants and non-participants. In its application the utility proposed two options for the purpose of addressing the purported cost shift. The first option would have required

[9] Utah PSC *Report and Order*, Docket No. 13-035-184, p. 66-68 (August 29, 2014).

new residential DG customers to enroll under a time-of-use demand rate schedule, while still allowing them to net meter. The second option would have replaced net metering with a buy-all, sell-all arrangement with the purchase price pegged to local wholesale market prices, and compensation provided in the form of a customer bill credit.[10]

Q. WHAT WAS THE OUTCOME OF THE PROCEEDING?

A. In December 2013 the ACC adopted Decision No. 74202, approving a variation of one alternative model put forth by Commission staff; an interim fixed monthly surcharge based on the nameplate capacity of the distributed generation system. The Commission set the monthly surcharge at $0.70 per kW, a level that reflects a compromise between the various estimates of the net costs and benefits of residential DG to non-participating customers that were introduced into the proceeding. The charge does not apply to systems installed prior to January 1, 2014, systems for which an interconnection application was received by the utility prior to January 1, 2014, or distributed generation customers enrolled in the utility's residential time-of-use demand rate schedule.

Q. DOES THE LEVEL OF THE SURCHARGE REFLECT THE RESULTS

[10] ACC Docket No. E-01345A-13-0248 *In the matter of the application of Arizona Public Service Company for approval of net metering cost shift solution,* available at: (http://edocket.azcc.gov/).

OF ANY SPECIFIC ANALYSIS OF THE COSTS AND BENEFITS OF NET METERING OR COST OF SERVICE STUDY?

A. No. As previously indicated, the Commission set the amount of the charge as a middle ground that falls within the range of net cost and benefits estimates provided by parties to the proceeding, each of which employed a unique methodology. The amount of the charge does not have any particular significance as a determination of the relative costs and benefits of DG systems or the level of any cost-shift between net metering participants and non-participants.

Q. ARE ALL CUSTOMERS WITH ON-SITE DISTRIBUTED GENERATION IN ARIZONA SUBJECT TO THIS SURCHARGE?

A. No. The surcharge is currently only authorized for residential customers of the Arizona Public Service (APS) Company. It does not apply to non-residential customers of APS, nor does it apply to customers of the state's other investor-owned utilities, Tucson Electric Power and UniSource Energy Services, or to customers of the state's rural electric cooperatives. Further, as previously noted, it does not apply to systems installed, or for which an interconnection application was received by the utility, prior to January 1, 2014 and it does not apply to DG customers on the utility's residential time-of-use demand rate schedule.

Q. UNDER WHAT CIRCUMSTANCES COULD THIS CHARGE BE APPLIED TO ADDITIONAL CUSTOMERS OR OTHERWISE CHANGED?

A. The ACC's December 2013 decision provides that grandfathered customers will remain so until at least APS's next rate case, and that the charge itself may be increased, decreased, left as is, or eliminated in the utility's next rate case. Along a similar line of logic, in 2014 the ACC declined to approve a request by the Sulphur Springs Valley Electric Cooperative (SSVEC) to institute a similar Fixed Cost Recovery Fee (FCRF) as part of a proceeding related to revisions to the utility's net metering tariff. The decision is consistent with the recommendations from ACC staff, which stated:

> Staff further believes that an FCRF is a rate design mechanism that necessitates the fine-grained documentation and cost-of-service studies required in a general rate case… Therefore, Staff has recommended that the Commission not approve SSVEC's proposed Fixed Cost Recovery Fee, and that such a fee not be considered outside of a full rate case proceeding.[11]

Q. HAS ARIZONA UNDERTAKEN ANY FURTHER ACTION ON THIS ISSUE?

A. Yes. In its December 2013 decision, the Commission elected to open a generic proceeding (ACC Docket No. E-00000J-14-0023) to further investigate the value and costs of distributed generation in order to inform future policy decisions. No decisions have been reached in this proceeding, which remains open.

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[11] ACC Decision No. 74704, Docket No. E-01575A-14-0232, p. 3-4 (August 26, 2014).

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN VIRGINIA.

A. In 2011, Virginia enacted H.B. 1983, amending the state's net metering law to increase the size limit on residential net metering systems from 10 kW to 20 kW, while also allowing utilities to propose standby charges on residential net metering customers with on-site generation systems larger than 10 kW. The law limits any such charge to that necessary to recover the portion of the utility's infrastructure costs associated with serving this subset of net metering customers, and requires the utility to receive approval from the Virginia Sate Corporation Commission ("SCC") of the methodology prior to implementing the charge. In July 2011, the Virginia Electric and Power Company ("Dominion Virginia") filed an application requesting approval of separate standby charges for the transmission and distribution components of the utility's rates, set on the basis of a customer's peak 30-minute demand during a billing month. Citing a lack of sufficient data, it proposed a placeholder standby charge of zero for the generation supply component of its rates, but indicated that it would study the issue in preparation for establishing such a charge in the future.[12]

Q. WHAT WAS THE OUTCOME OF THIS PROCEEDING?

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[12] SCC Docket No. PUE-2011-00088. *Virginia Electric and Power Company – For approval of a standby charge and methodology and revisions to its tariff and terms and conditions of service pursuant to VA Code section 56-594F.,* available at: (http://docket.scc.virginia.gov/vaprod/main.asp).

A. In November 2011, the SCC issued a final order approving the utility's request, establishing charges of $2.79 per kW of the customer demand for the distribution component, and $1.40 per kW of customer demand for the transmission component, applicable to residential net metering customers with systems larger than 10 kW-AC and effective April 1, 2012. The approved tariff provides that any volumetric charges that the customer owes for these components are subtracted from the charge, but the charge cannot be negative (i.e., become a credit). Thus, the charge operates in a manner similar to a mandatory demand rate, but differs from a typical demand rate because it is reduced by volumetric billings. The Commission declined the authorize the request for a "placeholder" generation supply standby charge, finding that the utility had not provided sufficient data for it to determine whether the statutory requirements had been met.[13]

Q. HAVE THERE BEEN ANY NEW DEVELOPMENTS ON THE TOPIC IN VIRGINIA SINCE THAT TIME?

A. Yes. First, in 2013 Virginia enacted H.B. 1695, which expanded net metering opportunities for agricultural service customers, and also subjected them to the same standby rate provisions as residential customers. Second, in March 2014 the Appalachian Power Company ("ApCo") requested permission to institute standby charges as part of a general rate case. In November 2014, the VCC issued a final order approving the implementation of separate transmission and distribution standby charges, set at $1.94 per kW for the distribution

[13] Final Order. SCC Docket No. PUE-2011-00088. November 23, 2011.

component, and $1.74 per kW for the transmission component. This charge will apply to residential and agricultural net metering customers that meet the 10 kW-AC system size requirement.[14]

Q. DID EITHER STANDBY CHARGE PROCEEDING INVOLVE A DETAILED STUDY OF NET METERING COSTS AND BENEFITS OR A COST OF SERVICE ANALYSIS FOR CUSTOMERS COVERED BY THE CHARGE?

A. No. In Dominion Virginia's calculations, the appropriate charges were based on its calculated cost of service for the residential class as a whole rather than net metering customers in general, or those with on-site generation systems larger than 10 kW-AC. It did not attempt to identify any offsetting benefits to the distribution grid, and citing a lack of load research data for net metering customers, it used an assumption of net metered customer load patterns to establish the transmission portion of the charge. While potential offsetting benefits were discussed in the proceeding, no formal study was undertaken and the Commission accepted the utility's proposed methodology unchanged. In its decision in the 2014 ApCo general rate case, the Commission approved the use of an identical methodology.

Q. PLEASE BRIEFLY DESCRIBE THE ACTIONS THAT CALIFORNIA HAS TAKEN ON THE ISSUE OF POTENTIAL COST SHIFTS, NET METERING, AND RATE DESIGN.

A. California's evaluations have proceeding along multiple fronts. As previously noted, in late 2012 the California Public Utilities Commission ("CPUC")

[14] Final Order. SCC Docket No. PUE-2014-00026. November 26, 2014.

contracted with an outside consultant for the performance of a net metering cost-benefit study, which was completed in October 2013.[15] In June 2012, it also began a generic investigation of overall residential rate design, which has included substantial discussion of how rate design changes would impact distribution generation (CPUC Rulemaking 12-06-013). Finally, in October 2013 it enacted A.B. 327, providing for the possible changes to net metering once the state reaches roughly 5,200 MW of net metering generation capacity. The enactment of A.B. 327 has in turn has led to the establishment of a new proceeding to examine the options for such a "successor" program (CPUC Rulemaking 14-07-002).[16]

Q. WHAT HAS RESULTED FROM THESE PROCEEDINGS?

A. While the individual efforts have taken their own unique paths, they ultimately exhibit close ties to one another and involve related subject matter. The October 2013 cost-benefit study found that among other things, the results were heavily influenced by rate design, most specifically the four-tiered inclining block structure of residential rates under which higher levels of electricity consumption result in higher rates.[17] In June 2014, the CPUC issued

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[15] The history and results of the study are available on the CPUC's web study page, *California Net Energy Metering (NEM) Ratepayer Impacts Evaluation*, available at: (http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm)

[16] Full information on both referenced proceedings is available on the CPUC Docket Card web site at: (http://delaps1.cpuc.ca.gov/cpuc_notices/DCID_html_access_Page.htm)

[17] *Id*. For information on how residential rate design acted as a factor in the results, see Sections 4.2 Bill Savings beginning on pg. 42, and Section 5 Full Cost of Service

Decision No. D.14-06-029 approving a settlement in Phase II of the residential rate design proceeding addressing interim rate proposals to take effect in 2014. Most significantly, the settlement retained the current four-tier structure, but allowed the differentials between the lower and upper tiers to be moderately flattened.

Phase I of the proceeding addresses rate design proposals for the 2015-2017 time frame, and remains ongoing. In Phase I, the Commission is considering further changes to the number of tiers, additional flattening of the tier differentials, increased fixed charges, and whether minimum bills are an appropriate substitute for fixed charges. Thus in the near-term, California has only made modest changes that affect all residential customers and intends to focus further efforts on general rate design issues that affect all residential customers. Only in the longer term, and presumably in a manner that takes into account these rate design changes, will it be considering changes that affect only net metering customers.

Q. IN LIGHT OF THE ABOVE, PLEASE REPRISE YOUR TESTIMONY AS IT RELATES TO REGULATORY CONSIDERATION OF THE NET METERING "COST-SHIFT" ISSUE.

A. Regulatory commissions throughout the country are devoting increased attention to studying the existence and magnitude of the purported cost-shift issue. The trend is towards thoughtful consideration and analysis rather than

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detailing the study's findings relative to whether net metering customers pay their full cost of service, beginning on pg. 82.

immediate action, in part due to statutory constraints, and in part due to a lack of reliable data upon which to base ratemaking decisions. Those few states that have undertaken recent action, as represented by additional charges on net metering customers, have done so only in a fairly narrow manner and without the benefit of full cost-benefit analyses based on a common, agreed upon set of assumptions and methodology. Those states that have completed such an evaluation have either not taken any specific additional action, or have embarked upon further investigations on the broader topic of underlying rate design as the source or solution to any apparent problem.

ACKNOWLEDGEMENT OF SETTLEMENT

Q. DID TASC ENTER INTO A SETTLEMENT OF THIS MATTER?

A. Yes. It is my understanding that TASC joined the Settlement Agreement that is being filed on December 11, 2014, in the spirit of compromise. TASC supports the Settlement Agreement and asks that the Commission approve it.

Q. FROM YOUR PERSPECTIVE, DOES THE SETTLEMENT PROVIDE FOR FULL RETAIL NET METERING?

A. Yes. The Settlement Agreement provides for full retail net metering, as described in my testimony, and the policy features key best practices such as full retail credit rollover and safe harbor from charges on net metering customers for a specified term. In my estimation, this Settlement significantly advances the state's net metering policy and continues the state's evolution toward best practices.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Direct Testimony of Justin R. Barnes
The Alliance for Solar Choice
DOCKET NO. 2014-246-E

EXHIBIT JRB-1

Justin R. Barnes

401 Harrison Oaks Blvd Suite 100 Cary, North Carolina 27513, (919) 825-3342, jbarnes@eq-research.com

EDUCATION

Michigan Technological University Houghton, Michigan
Master of Science, Environmental Policy August 2006
Graduate-level work in Energy Policy.

University of Oklahoma Norman, Oklahoma
Bachelor of Science, Geography, December 2003
Area of concentration in Physical Geography.

EXPERIENCE

EQ Research, LLC and **Keyes, Fox & Wiedman, LLP** Cary, North Carolina
Senior Analyst, March 2013 – present
Develop and manage solar and wind energy state regulatory policy tracking service that covers policies such as net metering, interconnection standards, rate design, renewables portfolio standards, state energy planning, state and utility incentives, tax incentives, and permitting. Responsible for service design, formulating improvements based on client needs, and ultimate delivery of bi-weekly reports to clients. Research pending renewable energy legislative policies for state policy tracking service. Research and summarize utility rate case filings for clients. Perform policy research and analysis to fulfill client requests, and for internal and published reports, focused primarily on state solar market drivers such as net metering, incentives, and renewable portfolio standards. Manage the development of a solar power purchase agreement (PPA) toolkit for local governments and the planning and delivery of associated outreach efforts.

North Carolina Solar Center, N.C. State University Raleigh, North Carolina
Senior Policy Analyst, January 2012-May 2013; *Policy Analyst,* September 2007-December 2011
Responsible for researching and maintaining information for the Database of State Incentives for Renewables and Efficiency (DSIRE), the most comprehensive public source of renewables and energy efficiency incentives and policy data in the United States. Managed state-level regulatory tracking for private wind and solar companies. Coordinated the organization's participation in the SunShot Solar Outreach Partnership, a U.S. Department of Energy project to provide outreach and technical assistance for local governments to develop and transform local solar markets. Developed and presented educational workshops, reports, administered grant contracts and associated deliverables, provided support for the SunShot Initiative, and worked with diverse group of project partners on this effort. Responsible for maintaining the renewable portfolio standard dataset for the National Renewable Energy Laboratory for use in its electricity modeling and forecasting analysis. Authored the *DSIRE RPS Data Updates*, a monthly newsletter providing up-to-date data and historic compliance information on state RPS policies. Responded to information requests and provided technical assistance to the general public, government officials, media, and the energy industry on a wide range of subjects, including federal tax incentives, state property taxes, net metering, state renewable portfolios standard policies, and renewable energy credits. Extensive experience researching, understanding, and disseminating information on complex issues associated with utility regulation, policy best practices, and emerging issues.

SELECTED ARTICLES and PUBLICATIONS

Barnes, J., Kapla, K. *Solar Power Purchase Agreements (PPAs): A Toolkit for Local Governments.* Pending Publication. For the Interstate Renewable Energy Council Inc. under the U.S. Department of Energy SunShot Solar Outreach Partnership.

Barnes, J., C. Barnes. *2013 RPS Legislation: Gauging the Impacts*. 2013. Article in Solar Today.

Barnes, J., C. Laurent, J. Uppal, C. Barnes, A. Heinemann. *Property Taxes and Solar PV: Policy, Practices, and Issues.* 2013. For the U.S. Department of Energy SunShot Solar Outreach Partnership.

Kooles, K, J. Barnes. *Austin, Texas: What is the Value of Solar. Solar in Small Communities: Gaston County, North Carolina. Solar in Small Communities: Columbia, Missouri.* 2013. For the U.S. Department of Energy SunShot Solar Outreach Partnership.

Barnes, J., C. Barnes. *The Report of My Death Was An Exaggeration: Renewables Portfolio Standards Live On*. 2013. For Keyes, Fox & Wiedman.

Barnes, J. *Why Tradable SRECs are Ruining Distributed Solar.* 2012. Guest Post in Greentech Media Solar.

Barnes, J., multiple co-authors. *State Solar Incentives and Policy Trends.* Annually for five years, 2008-2012. For the Interstate Renewable Energy Council, Inc.

Barnes, J. *Solar for Everyone?* 2012. Article in Solar Power World On-line.

Barnes, J., L. Varnado. *Why Bother? Capturing the Value of Net Metering in Competitive Choice Markets.* 2011. American Solar Energy Society Conference Proceedings.

Barnes, J. *SREC Markets: The Murky Side of Solar.* 2011. Article in State and Local Energy Report.

Barnes, J., L. Varnado. *The Intersection of Net Metering and Retail Choice: an overview of policy, practice, and issues*. 2010. For the Interstate Renewable Energy Council, Inc.

AWARDS, HONORS & AFFILIATIONS

- Solar Power World Magazine, Editorial Advisory Board Member (October 2011 – March 2013)
- Michigan Tech Finalist for the Midwest Association of Graduate Schools Distinguished Master's Thesis Awards (2007)
- Sustainable Futures Institute Graduate Scholar Michigan Tech University (2005-2006)

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA
UTILITIES COMMISSION

DOCKET NO. 2014-246-E

In Re: Petition to Establish	)	
Generic Proceeding Pursuant to the	)	
Distributed Energy Resource	)	**DIRECT TESTIMONY OF**
Program Act,	)	**JUSTIN R. BARNES ON BEHALF**
Act No. 236 of 2014,	)	**OF THE ALLIANCE FOR**
Ratification No. 241,	)	**SOLAR CHOICE**
Senate Bill No. 1189	)	

December 11, 2014 (*Amended January 2, 2015*)

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Exhibit JRB-1

I. Introduction

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND CURRENT POSITION.

A. Justin R. Barnes, 401 Harrison Oaks Blvd Suite 100, Cary, North Carolina, 27513. My current position is Senior Research Analyst with EQ Research LLC.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of The Alliance for Solar Choice ("TASC").

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND OCCUPATIONAL BACKGROUND.

A. I obtained a Bachelor of Science in Geography from the University of Oklahoma in 2003 and a Master of Science in Environmental Policy from Michigan Technological University in 2006. I was employed at the North Carolina Solar Center at N.C. State University for more than five years, where I worked on the *Database of State Incentives for Renewables and Efficiency (DSIRE)* project, and several other projects related to state renewable energy and efficiency policy. In my current position at EQ Research, I manage and perform research for a solar regulatory policy tracking service, contribute as a researcher to standard policy service offerings, and perform customized research. My *curriculum vitae* is attached as **Exhibit JRB-1**.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide a general overview of net metering policy nationally and to provide background on the evolution of the policy in South Carolina, in particular. I also provide observations about regulatory proceedings from around the country that have tackled similar issues that are being contemplated here, as the Commission considers both the methodology and the form of net metering rates or tariffs.

II. National Net Metering Policy

Q. WHAT IS NET METERING?

A. The precise definition of net metering has been stated in a variety of different ways in different forums. Though the terminology used from place to place may differ, the definitions consistently define an arrangement where a customer is permitted to self-supply his or her electricity needs with a generation system installed on the customer side of the utility meter, and offset electricity delivered from a utility with electricity delivered to the utility during a billing period. Thus, the customer's monthly bill reflects on the net amount of usage during the billing period, as electric deliveries to and from the customer offset one another at a 1:1 ratio. This is often visualized as a customer's electric meter running backwards during times when the customer is delivering electricity to the utility, and vice versa.

Q. HOW HAS NET METERING BEEN DEFINED AT THE FEDERAL LEVEL?

A. While net metering policies are determined at the state level, the term "net metering" has been defined or described on multiple occasions at the federal level. Section 1251 of the federal Energy Policy Act of 2005 ("EPAct of 2005") provided the following definition of net metering, which has been referenced in many states, including South Carolina, in regulatory proceedings on the topic.

> …the term 'net metering service' means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.

The Federal Energy Regulatory Commission ("FERC") has likewise provided a description of net metering on more than one occasion. For instance, in a 2001 decision on whether the net metering rules adopted by the Iowa Utilities Board were preempted by federal law, the FERC affirmed its prior decisions finding that the practice of netting customer usage over a time period did not constitute a sale of electricity, and that the typical monthly billing cycle for retail customers was a reasonable time period for the measurement.[1]

In addition, in Order 2003-A establishing small generator interconnection procedures, the FERC described net metering in the following manner:

> Essentially, the electric meter "runs backwards" during the portion of the billing cycle when the load produces more power that it needs, and runs normally when the load takes electricity off the system.[2]

Q. YOU NOTED THAT NET METERING POLICIES ARE PRESENTLY DETERMINED BY STATES. HOW MANY STATES CURRENTLY HAVE NET METERING POLICIES IN PLACE?

A. Net metering is mandated by statute or regulation in 44 states, plus the District of Columbia. States vary in the approaches they have taken to implement net metering, however. Generally speaking, the states with higher penetrations of distributed solar have continually revised their net metering policies and regulations to ensure they do not penalize customer-generators for offsetting their energy use.

Q. PLEASE DESCRIBE SOME OF THE VARIATIONS THAT EXIST IN STATE NET METERING POLICIES.

A. The differences in state net metering policies are numerous. They include, but are not limited to, aspects such as eligible resources/technologies; eligible

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[1] *MidAmerican*, 94 FERC ¶ 61,340, at 62,262-64 (2001).

[2] *Standardization of Generator Interconnection Agreements and Procedures*, Order No. 2003-A, FERC Stats. & Regs. ¶ 31,160 at P 744.

customer classes; system sizes limits; aggregate participation limits; the treatment of monthly and annual net excess generation (rollover); customer protections against additional fees; and renewable energy credit ownership. [3]

Q. HOW DO STATES DIFFER IN TERMS OF TREATING MONTHLY NET EXCESS GENERATION ("NEG") OR ROLLOVER?

A. Most net-metering policies allow customers to carry NEG forward to the following month on a kilowatt-hour (kWh) basis for up to 12 months. The large majority (35 states) take this approach, which I will refer to here as "true" or "full retail" net metering. Nine states take a more restrictive view of net metering, requiring utilities to reconcile net metering accounts each month, with any excess generation paid out at a wholesale rate.

Q. WHY ARE THE MONTHLY ROLLOVER PROVISIONS IMPORTANT?

A. Customer energy usage patterns and distributed generation production profiles vary from month to month, the result being that a customer production will almost certainly not match usage in any given month. Some months, accounting for seasonal variations in weather and system production, tend to consistently show larger differences than others. Monthly kWh rollover allows a net metering customer to appropriately size his or her system to match annual

[3] For more information, the Freeing the Grid project grades states' net metering and interconnection policies based on their transparency, accessibility and consistency. Freeing the Grid's scoring mechanism is detailed in the *Freeing the Grid 2014 Best Practices in State Net Metering and Interconnection* report, found on its website (available at www.freeingthegrid.org). The report contains an explanation of the scoring system as it relates to the state policy variations identified above. It also contains an index of all state scores in Appendix A.

consumption, effectively extending the netting period to an annual, or in some cases indefinite, time frame. This enables the customer to pursue full self-supply of on-site energy consumption on an annual basis without being subject to a possible diminishment of the value of his or her on-site energy production from month to month.

Q. HAS THIS ASPECT OF POLICY HAD AN IMPACT ON NET METERING PARTICIPATION IN SOUTH CAROLINA?

A. It is difficult to attribute causation to any specific element of net metering policy or change thereto, as many factors go into a consumer's choice to install distributed generation. However, the net metering reports provided by individual utilities are suggestive. In their 2009 reports, utilities identified a total of 38 net metering customers, while in their 2013 reports that number had increased to 298 customers. This seems to indicate that on-site generation and net metering has become increasingly attractive to customers and it is reasonable to think that part of this is due to changes in the terms of the programs themselves.

Q. WHAT CAN YOU CONCLUDE ABOUT HOW STATES HAVE DEFINED NET METERING BASED ON THEIR IMPLEMENTATION PRACTICES?

A. First and foremost, states have defined net metering to refer to a billing practice that involves the netting of electricity deliveries to and from the utility over a period of at least one month. Significantly, 80% of states with a net metering policy allow full "retail net metering", which permits a customer to carry over excess generation from month to month to offset consumption of kWhs in a future month at a 1:1 ratio.

III. South Carolina's Net Metering Policy

Q. PLEASE BRIEFLY SUMMARIZE THE ORIGINS OF SOUTH CAROLINA'S NET METERING POLICY.

A. Net metering in South Carolina originated in response to the provisions of Section 1251 of the federal EPAct of 2005, which among other things required state regulatory commissions to consider the adoption of net metering requirements for utilities that they regulate. The proceeding commenced in 2006 in Docket No. 2005-385-E and after multiple rounds of comments and hearings, the Commission issued Order No. 2008-0416 in June 2008 approving the adoption of utility tariffs to implement the new program. The June 2008 adoption order further provided for a review of the net metering program in roughly 12 months time.

Q. HAVE ANY DEFINITIONS OR DESCRIPTIONS OF THE TERM "NET METERING" BEEN INTRODUCED IN PREVIOUS REGULATORY PROCEEDINGS IN SOUTH CAROLINA?

A. Yes. Since South Carolina's net metering programs originated in response to the EPAct of 2005, the definition contained in Section 1251 formed the initial foundation of Commission discussions on the matter. This basis has been refined and elaborated upon over time as the state's net metering program has evolved. For its part, in 2007 testimony the Office of Regulatory Staff (ORS) has described net metering as follows:

> Generally, in a net metering program, the IOU allows a customer's meter to run in reverse if the electricity the customer generates is more than the customer is consuming. Generally speaking, at the end of the billing period, the customer only pays for his or her net consumption, which is the amount of resources consumed, minus the amount of resources generated.[4]

As described in more detail below, the associated utility programs have not historically been entirely consistent with this description. However, South Carolina's net metering program has changed over time to become more uniform from utility to utility, and each utility now offers a net metering arrangement that corresponds to the generally accepted definition of the term.

Q. UNDER WHAT TERMS DID NET METERING BECOME AVAILABLE TO ELECTRICITY CUSTOMERS IN SOUTH CAROLINA?

A. Pursuant to the Commission's June 2008 order, net metering became available to customers on July 1, 2008. Each utility initially offered two distinct rate riders for small customer generators. One rider was typically termed a "net metering" rider, and was only available to customers on time-of-use rate schedules with demand rate components. As written, these collective riders allowed any excess energy delivered to the utility at any point in time to reduce the amount of billed on-peak and off-peak usage, with any net excess during a

[4] Docket No. 2005-385-E, Direct Testimony and Exhibits of A. Randy Watts, p. 6 at lines 10-14 (April 10, 2007).

monthly period being carried forward to the following month. Thus in effect, the customer's bill reflected only net consumption during the billing period, and excess in one month could offset net consumption during the next month at a 1:1 ratio.

Each utility also offered a second rider, sometimes termed the "flat-rate" option, which did not require customers to enroll in a time-of-use demand rate schedule and instead allowed them to remain on any existing rate schedule for which they were eligible. Under this rider, customers were permitted to self-supply their on-site energy needs, but were credited for excess generation delivered to the utility at any given time at a time differentiated avoided cost rate. Each utility tariff within this category contained an additional monthly fee, and in the case of Duke Energy, a monthly standby charge based on the nameplate rating of the customer's on-site generation system.

Q. ARE BOTH OF THESE ARRANGEMENTS CONSIDERED TO BE "NET METERING" UNDER GENERALLY ACCEPTED DEFINITIONS OF THE TERM?

A. No. The first set of tariffs referenced above, applicable to customers on a time-of-use demand rate, do meet the definition of net metering as the term is commonly understood, though most states do not limit the choice of rate schedules available to net metering customers, and in fact some states expressly forbid such a requirement in their net metering laws. However, based on billing examples provided to the South Carolina Energy Office and contained in its report entitled *Net Metering in South Carolina: Current Status* *and Recommendations*, in at least one case (Progress Energy) it appears that true netting arrangement was not implemented in practice at that time.

As is evident in the examples provided by Progress and found in Appendix H of the report, a customer on the time-of-use demand rate could have both a non-zero amount of net billed usage, and excess generation for the same on-peak or off-peak time period within a single billing period. In any net metering program, there can be no *excess generation* during a time period unless the net consumption for the same period has already been reduced to zero. Otherwise, there has been no *netting* of *metered* consumption and the customer is not *net metered*. On the other hand, Duke Energy's billing examples, found in Appendix G, and the Energy Office's recommended net metering structure do represent a net metering arrangement.[5]

The second set of tariffs defining the "flat rate" option do not represent net metering as the term is commonly used and implemented because there is no "netting" of metered consumption and deliveries to the utility within a billing period. As previously implemented, the Progress Energy time-of-use net metering rate option fell into this category as well.

Q. PLEASE DESCRIBE HOW NET METERING HAS EVOLVED IN SOUTH CAROLINA SINCE THE INITIAL ADOPTION OF NET

[5] The billing examples referenced above are indicated in the report as those applicable to "TOUD" customers in the respective appendices (Appendix H for Progress Energy and Appendix G for Duke Energy). They do not refer to the identified "Flat Rate" options, which in neither case represent net metering. The referenced report is available at: (http://www.energy.sc.gov/utilities/metering).

METERING TARIFFS IN 2008.

A. The most significant changes to net metering since 2008 occurred with the adoption Order 2009-552 in August 2009 (Docket No. 2005-385-E), which approved a Settlement in connection with the Commission's 12-month review of utility's net metering programs. The Settlement was based on the recommendations contained in above referenced report from the South Carolina Energy Office. Among other things, it provided a modification to the "flat rate" option for residential customers to offer retail crediting of excess generation credits; eliminated residential standby charges; and allowed net metering generators to retain ownership of renewable energy credits (RECs) until such a time as a REC market was fully developed. In effect, the settlement revised the residential "flat rate" option such that it became consistent with net metering as the term is commonly understood, while also making the arrangement more favorable for customers in several other ways and providing greater standardization among utilities. Since the 2009 settlement, only minor changes to utility net metering tariffs have been authorized, in both cases related to the date for annual customer account resets.

Q. BASED ON THE PRECEDING DISCUSSION, WHAT CAN WE CONCLUDE ABOUT HOW THE TERM "NET METERING" HAS COME TO BE DEFINED IN SOUTH CAROLINA?

A. Stated simply, we can say that since 2009 South Carolina has had a uniform definition of net metering that is consistent with how the term is commonly understood at the federal, state, and utility level throughout the country. More specifically, it has recognized that net metering involves a customer's self supply of electricity (i.e., not a buy-all, sell-all arrangement), where incidental deliveries of electricity between the customer and the utility during a billing period are accounted for by netting one against the other at a 1:1 ratio. Further, it has adopted a form of net metering sometimes referred to as "retail net metering", that allows net excess during one month to offset net consumption during future months at the same 1:1 ratio.

IV. Current Trends in Net Metering Policy

Q. ARE THERE ANY TRENDS THAT YOU HAVE SEEN IN THE EVOLUTION OF NET METERING POLICIES IN RECENT YEARS?

A. If one were to look at the individual components of state net metering policies, it is likely that a number of trends would be apparent. However, the most prominent trend is increasing scrutiny of whether, and to what degree, net metering allows participating customers to avoid paying for grid infrastructure costs, reducing utility collections of these costs and shifting the burdens of payment to customers that do not participate in net metering. This effect is most often termed the "cost-shift" or "cross-subsidy" issue. While this potential problem has been frequently raised ever since the advent of net metering, it has garnered increasing attention during the last several years as the number of net metering customers has increased.

Q. HOW HAVE STATES RESPONDED TO THIS POTENTIAL ISSUE?

A. Not all states have undertaken any specific action, but where movement on the issue has taken place, the response has most often been to convene a regulatory proceeding to investigate the costs and benefits of net metering, or in some cases distributed generation in general. The general focus has been on undertaking an analysis to discover whether the costs outweigh the benefits. Stated another way, the purpose has to been to diagnose whether a problem actually exists, or may exist in the future.

Q. IN WHICH STATES HAVE FORMAL PROCEEDINGS BEEN ESTABLISHED TO STUDY THE COSTS AND BENEFITS OF NET METERING OR DISTRIBUTED GENERATION?

A. I am aware of continuing or completed proceedings of this type in the states listed below.

- Arizona
- California
- Colorado
- Louisiana
- Maine
- Mississippi
- Nevada
- New York
- Utah
- Vermont
- Washington

Q. WHAT TYPES OF OUTCOMES FROM THESE INVESTIGATIONS?

A. In Arizona, Colorado, Maine, New York, Utah and Washington, the proceedings are ongoing and as yet have not resulted in the completion of a formal study. Studies have been completed in California, Mississippi, Nevada and Vermont, while in Louisiana an outside contractor has been selected to perform a formal study, but the results are not yet available.

Regulatory commissions in California, Nevada and Vermont have also instituted proceedings to further investigate potential future changes to net metering and/or overall rate design. The extended Nevada and Vermont proceedings are currently in their very early stages. I describe the California discussions, which are somewhat more advanced, later in my testimony.

Q. HAVE ANY OF THESE STATES ACTUALLY MADE CHANGES TO NET METERING AS A RESULT OF THEIR STUDIES, SUCH AS PRESCRIBING ADDITIONAL CHARGES ON NET METERING CUSTOMERS?

A. No. As I describe in more detail later, though Arizona has approved the establishment of a small additional monthly charge on some residential customers of Arizona Public Service ("APS"), it actually did so *prior to* convening a formal proceeding to study the issue. The current study proceeding stems from the considering disputes which arose during the proceeding on the monthly charge.

Q. ARE THERE OTHER RECENT EXAMPLES OF FORMAL PROCEEDINGS WHERE THE ISSUE OF INFRASTRUCTURE COST RECOVERY AND ADDITIONAL CHARGES ON NET METERING CUSTOMERS HAS BEEN RAISED?

A. Yes. Utilities in Maine, South Dakota[6], Utah, Virginia and Wisconsin have made proposals to impose additional charges on some or all distributed generation customers as part of general rate case proceedings. In addition, utilities in Arizona, Idaho and Virginia have proposed rate changes purported to address the issue outside of rate case proceedings.

Q. HAVE CHANGES TO NET METERING ARISEN FROM ANY OF THESE PROCEEDINGS?

A. Yes, though only in a limited number of cases. As noted above, one utility in Arizona has been permitted to levy an additional charge on some residential net metering customers, while in Virginia, the state's two largest utilities, Dominion Virginia and Appalachian Power, have been permitted to levy standby charges on a small subset of net metering customers.

In two other cases, Utah and Idaho, regulators declined to allow the new charges, reasoning that the available evidence was insufficient to justify such a decision. The Utah cost-benefit investigation referenced above was established as a direct result of this decision. I elaborate on the Arizona, Utah and Virginia examples later in my testimony.

In the Maine and South Dakota cases, the proposals were ultimately voluntarily withdrawn by the utility, while in the Wisconsin case, a formal

[6] The South Dakota example, a proposal brought forth by Black Hills Power Inc., would have required residential customers with on-site generation to enroll in a demand rate, rather than impose an additional surcharge. South Dakota does not actually have a statewide net metering policy, nor does Black Hills Power offer such a program.

decision has not yet been issued.

Q. WHAT DEGREE OF DISCRETION DO STATE REGULATORY COMMISSIONS HAVE WITH RESPECT TO RATEMAKING DECISIONS THAT AFFECT NET METERING CUSTOMERS?

A. It varies from state to state. Some net metering laws, including but not limited to those in California, Delaware, Kentucky, Missouri, Nevada, New Jersey, Ohio and Vermont, have so-called "safe harbor" clauses that protect customers from additional charges that do not apply to all customers. In some cases, these clauses also require that net metering customers have the same choice of rate schedules available to all other customers within the same customer class (e.g., tariffs may not require the customer to enroll in a demand rate). In at least seven states, the Commission currently has the discretion to establish additional charges specifically on net metering customers, but is not permitted to do so without first evaluating the costs and benefits of the net metering program. Four of these seven states, Arizona, Louisiana, Utah and Washington, are represented in the list of states that have convened cost-benefit investigations.

Q. DOES SOUTH CAROLINA'S NET METERING POLICY CONTAIN ANY LIMITATIONS OF THIS TYPE?

A. Historically it did not, because prior to the enactment of S.B. 1189 in 2013, there was no statutory basis for net metering in South Carolina. The Commission was therefore unencumbered by any constraints as it developed and modified the program, though as previously noted, it eventually elected to eliminate standby charges on residential customers and allow them to net metering on either flat rate or time-of-use demand rate schedules. With the enactment of S.B. 1189, South Carolina now constitutes one of the seven states that grant the Commission discretion on the imposition of any additional charges or credits, but only after a cost-benefit evaluation.

Q. IN YOUR PRIOR TESTIMONY, YOU INDICATED THAT YOU WOULD ELABORATE ON THE DETAILS OF SEVERAL RECENT PROCEEDINGS INVOLVING NET METERING AND RATE DESIGN ISSUES. PLEASE REPRISE THAT LIST OF STATES AND WHY YOU WOULD LIKE TO DISCUSS THEM IN FURTHER DETAIL.

A. I would like to provide further details on proceedings in Arizona, Utah and Virginia because they are all states where the prospect of additional charges on net metering customers has been considered by a Commission and achieved at least some temporary resolution. An understanding of the finer elements of these cases and their outcomes is important when considering "trends" on the issue of regulatory consideration of purported net metering cost-shifts. More specifically, they contradict any assertion that recent Commission decisions on the matter display a trend towards broadly instituting additional charges on net metering customers, and that the charges which have been imposed are based on a full evaluation of net metering costs and benefits. I mention California because it has conducted extensive study and stakeholder consultation on these related matters, in large part due to the fact that it has been and remains the single largest market for residential solar.[7]

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN UTAH.

A. In January 2014 Rocky Mountain Power (referred to as "RMP" or "PacifiCorp") filed a general rate case application, which among other things proposed to institute a fixed facilities charge of $4.25 per month on residential net metering customers. As the case went through settlement proceedings, RMP increased its requested net metering facilities charge to $4.65 per month.[8]

Q. WHAT WAS THE OUTCOME OF THE PROCEEDING?

A. As previously noted, Utah is one of a number of states where such a charge may only be instituted if it can be determined that the costs of the net metering program exceed the benefits. In analyzing RMP's proposal in light of this requirement, the Commission found that the evidence was insufficient to justify an additional charge or additional credit. Thus in its August 2014 final order on the matter, it declined to allow the utility to institute the proposed

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[7] See for example *U.S. Solar Market Trends 2013* published by the Interstate Renewable Energy Council (http://www.irecusa.org/publications/). As indicated in Appendix C, during 2013 more than 45% of all of the residential solar PV installed in the U.S. was in California, and California installed almost four times as much residential solar PV as the next most prolific state.

[8] The utility's application was docketed in 2013 upon the filing of its Notice of Intent in Utah PSC Docket No. 13-035-184, *In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of its Proposed Electric Service Schedules and Electric Service Regulations*, available on line at: (http://www.psc.state.ut.us/utilities/electric/elecindx/2013/13035184indx.html).

charge, and elected to establish a new proceeding to investigate the costs and benefits of the utility's net metering program in a more comprehensive manner. Among the tasks to be completed as part of this investigation is a load research study of residential net metering customers. The excerpt below from the August 2014 Report and Order is a representative, though not comprehensive, sample of the Commission's analysis and conclusions on the matter.

> Based on our review of the record in this proceeding, we conclude the evidence is inconclusive, insufficient, and inadequate to make a determination under Utah Code Ann. § 54-15-105.1(1) whether costs PacifiCorp or its customers will incur from the net metering program will exceed the benefits of the net metering program, or whether the benefits of the net metering program will exceed the costs. Thus, we cannot conclude that the proposed net metering facilities charge is just and reasonable under Utah Code Ann. § 54-15-105.1(2), and we decline to approve the charge at this time.
>
> We recognize PacifiCorp's electric system is undergoing transformation as it integrates customer-owned generation, and that this integration has cost implications. Although there is insufficient evidence to make the determinations required in Utah Code Ann. § 54-15-105.1 in this proceeding, we

> acknowledge PacifiCorp, the Division and the Office have raised important issues regarding the potential for cost shifting from net metered customers to PacifiCorp's general body of customers. We also recognize other parties have provided at least some evidence of a range of asserted benefits to the system and ratepayers from residential rooftop solar generation. We feel strongly that the questions these positions raise should be thoroughly examined based on the appropriate data and analysis pertaining to the full array of relevant, measurable costs and benefits…
>
> We emphasize that ratemaking is a dynamic process and must respond appropriately as the demands customers place on the utility system change. Prior to approving responsive new rate structures, we must understand these changes. For example, if net metered customers are a subclass (as PacifiCorp asserts), data must confirm this assertion. We cannot determine from the record in this proceeding that this group of customers is distinguishable on a cost of service basis from the general body of residential customers. Simply using less energy than average, but about the same amount as the most typical of PacifiCorp's residential customers, is not sufficient justification for imposing a charge, as there will always be customers who are below and

above average in any class. Such is the nature of an average. In this instance, if we are to implement a facilities charge or a new rate design, we must understand the usage characteristics, e.g., the load profile, load factor, and contribution to relevant peak demand, of the net metered subgroup of residential customers. We must have evidence showing the impact this demand profile has on the cost to serve them, in order to understand the system costs caused by these customers. This type of analysis is a necessary part of determining the relationship of costs and benefits of the net metering program as required by the Net Metering Code.[9]

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN ARIZONA.

A. In July 2013 the Arizona Corporation Commission (ACC) opened a proceeding to address a proposal by the Arizona Public Service Company (APS) for approval of a "Net Metering Cost Shift Solution" applicable to the residential sector. The proceeding stemmed from discussions and debates that took place in earlier formal and informal settings as to the existence and magnitude of any cost shifts between net metering participants and non-participants. In its application the utility proposed two options for the purpose of addressing the purported cost shift. The first option would have required

[9] Utah PSC *Report and Order*, Docket No. 13-035-184, p. 66-68 (August 29, 2014).

new residential DG customers to enroll under a time-of-use demand rate schedule, while still allowing them to net meter. The second option would have replaced net metering with a buy-all, sell-all arrangement with the purchase price pegged to local wholesale market prices, and compensation provided in the form of a customer bill credit.[10]

Q. WHAT WAS THE OUTCOME OF THE PROCEEDING?

A. In December 2013 the ACC adopted Decision No. 74202, approving a variation of one alternative model put forth by Commission staff; an interim fixed monthly surcharge based on the nameplate capacity of the distributed generation system. The Commission set the monthly surcharge at $0.70 per kW, a level that reflects a compromise between the various estimates of the net costs and benefits of residential DG to non-participating customers that were introduced into the proceeding. The charge does not apply to systems installed prior to January 1, 2014, systems for which an interconnection application was received by the utility prior to January 1, 2014, or distributed generation customers enrolled in the utility's residential time-of-use demand rate schedule.

Q. DOES THE LEVEL OF THE SURCHARGE REFLECT THE RESULTS

[10] ACC Docket No. E-01345A-13-0248 *In the matter of the application of Arizona Public Service Company for approval of net metering cost shift solution,* available at: (http://edocket.azcc.gov/).

OF ANY SPECIFIC ANALYSIS OF THE COSTS AND BENEFITS OF NET METERING OR COST OF SERVICE STUDY?

A. No. As previously indicated, the Commission set the amount of the charge as a middle ground that falls within the range of net cost and benefits estimates provided by parties to the proceeding, each of which employed a unique methodology. The amount of the charge does not have any particular significance as a determination of the relative costs and benefits of DG systems or the level of any cost-shift between net metering participants and non-participants.

Q. ARE ALL CUSTOMERS WITH ON-SITE DISTRIBUTED GENERATION IN ARIZONA SUBJECT TO THIS SURCHARGE?

A. No. The surcharge is currently only authorized for residential customers of the Arizona Public Service (APS) Company. It does not apply to non-residential customers of APS, nor does it apply to customers of the state's other investor-owned utilities, Tucson Electric Power and UniSource Energy Services, or to customers of the state's rural electric cooperatives. Further, as previously noted, it does not apply to systems installed, or for which an interconnection application was received by the utility, prior to January 1, 2014 and it does not apply to DG customers on the utility's residential time-of-use demand rate schedule.

Q. UNDER WHAT CIRCUMSTANCES COULD THIS CHARGE BE APPLIED TO ADDITIONAL CUSTOMERS OR OTHERWISE CHANGED?

A. The ACC's December 2013 decision provides that grandfathered customers will remain so until at least APS's next rate case, and that the charge itself may be increased, decreased, left as is, or eliminated in the utility's next rate case. Along a similar line of logic, in 2014 the ACC declined to approve a request by the Sulphur Springs Valley Electric Cooperative (SSVEC) to institute a similar Fixed Cost Recovery Fee (FCRF) as part of a proceeding related to revisions to the utility's net metering tariff. The decision is consistent with the recommendations from ACC staff, which stated:

> Staff further believes that an FCRF is a rate design mechanism that necessitates the fine-grained documentation and cost-of-service studies required in a general rate case… Therefore, Staff has recommended that the Commission not approve SSVEC's proposed Fixed Cost Recovery Fee, and that such a fee not be considered outside of a full rate case proceeding.[11]

Q. HAS ARIZONA UNDERTAKEN ANY FURTHER ACTION ON THIS ISSUE?

A. Yes. In its December 2013 decision, the Commission elected to open a generic proceeding (ACC Docket No. E-00000J-14-0023) to further investigate the value and costs of distributed generation in order to inform future policy decisions. No decisions have been reached in this proceeding, which remains open.

[11] ACC Decision No. 74704, Docket No. E-01575A-14-0232, p. 3-4 (August 26, 2014).

Q. PLEASE BRIEFLY DESCRIBE HOW THE ISSUE OF NET METERING IMPACTS ON PARTICIPANTS AND NON-PARTICIPANTS CAME TO BE ADDRESSED IN VIRGINIA.

A. In 2011, Virginia enacted H.B. 1983, amending the state's net metering law to increase the size limit on residential net metering systems from 10 kW to 20 kW, while also allowing utilities to propose standby charges on residential net metering customers with on-site generation systems larger than 10 kW. The law limits any such charge to that necessary to recover the portion of the utility's infrastructure costs associated with serving this subset of net metering customers, and requires the utility to receive approval from the Virginia Sate Corporation Commission ("SCC") of the methodology prior to implementing the charge. In July 2011, the Virginia Electric and Power Company ("Dominion Virginia") filed an application requesting approval of separate standby charges for the transmission and distribution components of the utility's rates, set on the basis of a customer's peak 30-minute demand during a billing month. Citing a lack of sufficient data, it proposed a placeholder standby charge of zero for the generation supply component of its rates, but indicated that it would study the issue in preparation for establishing such a charge in the future.[12]

Q. WHAT WAS THE OUTCOME OF THIS PROCEEDING?

[12] SCC Docket No. PUE-2011-00088. *Virginia Electric and Power Company – For approval of a standby charge and methodology and revisions to its tariff and terms and conditions of service pursuant to VA Code section 56-594F.,* available at: (http://docket.scc.virginia.gov/vaprod/main.asp).

A. In November 2011, the SCC issued a final order approving the utility's request, establishing charges of $2.79 per kW of the customer demand for the distribution component, and $1.40 per kW of customer demand for the transmission component, applicable to residential net metering customers with systems larger than 10 kW-AC and effective April 1, 2012. The approved tariff provides that any volumetric charges that the customer owes for these components are subtracted from the charge, but the charge cannot be negative (i.e., become a credit). Thus, the charge operates in a manner similar to a mandatory demand rate, but differs from a typical demand rate because it is reduced by volumetric billings. The Commission declined the authorize the request for a "placeholder" generation supply standby charge, finding that the utility had not provided sufficient data for it to determine whether the statutory requirements had been met.[13]

Q. HAVE THERE BEEN ANY NEW DEVELOPMENTS ON THE TOPIC IN VIRGINIA SINCE THAT TIME?

A. Yes. First, in 2013 Virginia enacted H.B. 1695, which expanded net metering opportunities for agricultural service customers, and also subjected them to the same standby rate provisions as residential customers. Second, in March 2014 the Appalachian Power Company ("ApCo") requested permission to institute standby charges as part of a general rate case. In November 2014, the VCC issued a final order approving the implementation of separate transmission and distribution standby charges, set at $1.94 per kW for the distribution

[13] Final Order. SCC Docket No. PUE-2011-00088. November 23, 2011.

component, and $1.74 per kW for the transmission component. This charge will apply to residential and agricultural net metering customers that meet the 10 kW-AC system size requirement.[14]

Q. DID EITHER STANDBY CHARGE PROCEEDING INVOLVE A DETAILED STUDY OF NET METERING COSTS AND BENEFITS OR A COST OF SERVICE ANALYSIS FOR CUSTOMERS COVERED BY THE CHARGE?

A. No. In Dominion Virginia's calculations, the appropriate charges were based on its calculated cost of service for the residential class as a whole rather than net metering customers in general, or those with on-site generation systems larger than 10 kW-AC. It did not attempt to identify any offsetting benefits to the distribution grid, and citing a lack of load research data for net metering customers, it used an assumption of net metered customer load patterns to establish the transmission portion of the charge. While potential offsetting benefits were discussed in the proceeding, no formal study was undertaken and the Commission accepted the utility's proposed methodology unchanged. In its decision in the 2014 ApCo general rate case, the Commission approved the use of an identical methodology.

Q. PLEASE BRIEFLY DESCRIBE THE ACTIONS THAT CALIFORNIA HAS TAKEN ON THE ISSUE OF POTENTIAL COST SHIFTS, NET METERING, AND RATE DESIGN.

A. California's evaluations have proceeding along multiple fronts. As previously noted, in late 2012 the California Public Utilities Commission ("CPUC")

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[14] Final Order. SCC Docket No. PUE-2014-00026. November 26, 2014.

contracted with an outside consultant for the performance of a net metering cost-benefit study, which was completed in October 2013.[15] In June 2012, it also began a generic investigation of overall residential rate design, which has included substantial discussion of how rate design changes would impact distribution generation (CPUC Rulemaking 12-06-013). Finally, in October 2013 it enacted A.B. 327, providing for the possible changes to net metering once the state reaches roughly 5,200 MW of net metering generation capacity. The enactment of A.B. 327 has in turn has led to the establishment of a new proceeding to examine the options for such a "successor" program (CPUC Rulemaking 14-07-002).[16]

Q. WHAT HAS RESULTED FROM THESE PROCEEDINGS?

A. While the individual efforts have taken their own unique paths, they ultimately exhibit close ties to one another and involve related subject matter. The October 2013 cost-benefit study found that among other things, the results were heavily influenced by rate design, most specifically the four-tiered inclining block structure of residential rates under which higher levels of electricity consumption result in higher rates.[17] In June 2014, the CPUC issued

[15] The history and results of the study are available on the CPUC's web study page, *California Net Energy Metering (NEM) Ratepayer Impacts Evaluation*, available at: (http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm)
[16] Full information on both referenced proceedings is available on the CPUC Docket Card web site at: (http://delaps1.cpuc.ca.gov/cpuc_notices/DCID_html_access_Page.htm)
[17] *Id*. For information on how residential rate design acted as a factor in the results, see Sections 4.2 Bill Savings beginning on pg. 42, and Section 5 Full Cost of Service

Decision No. D.14-06-029 approving a settlement in Phase II of the residential rate design proceeding addressing interim rate proposals to take effect in 2014. Most significantly, the settlement retained the current four-tier structure, but allowed the differentials between the lower and upper tiers to be moderately flattened.

Phase I of the proceeding addresses rate design proposals for the 2015-2017 time frame, and remains ongoing. In Phase I, the Commission is considering further changes to the number of tiers, additional flattening of the tier differentials, increased fixed charges, and whether minimum bills are an appropriate substitute for fixed charges. Thus in the near-term, California has only made modest changes that affect all residential customers and intends to focus further efforts on general rate design issues that affect all residential customers. Only in the longer term, and presumably in a manner that takes into account these rate design changes, will it be considering changes that affect only net metering customers.

Q. IN LIGHT OF THE ABOVE, PLEASE REPRISE YOUR TESTIMONY AS IT RELATES TO REGULATORY CONSIDERATION OF THE NET METERING "COST-SHIFT" ISSUE.

A. Regulatory commissions throughout the country are devoting increased attention to studying the existence and magnitude of the purported cost-shift issue. The trend is towards thoughtful consideration and analysis rather than

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detailing the study's findings relative to whether net metering customers pay their full cost of service, beginning on pg. 82.

immediate action, in part due to statutory constraints, and in part due to a lack of reliable data upon which to base ratemaking decisions. Those few states that have undertaken recent action, as represented by additional charges on net metering customers, have done so only in a fairly narrow manner and without the benefit of full cost-benefit analyses based on a common, agreed upon set of assumptions and methodology. Those states that have completed such an evaluation have either not taken any specific additional action, or have embarked upon further investigations on the broader topic of underlying rate design as the source or solution to any apparent problem.

Q. SOME OF YOUR TESTIMONY SET FORTH ABOVE INCLUDES RECOMMENDATIONS THAT ARE NOT SET FORTH WITHIN THE SETTLEMENT AGREEMENT. HOW SHOULD THE COMMISSION CONSIDER THESE RECOMMENDATIONS, IN LIGHT OF TASC'S SUPPORT OF THE SETTLEMENT AGREEMENT?

A. To the extent any of my testimony directly conflicts with the terms of the Settlement Agreement, it should be considered only if the Commission does not approve the settlement. TASC believes the Settlement Agreement is reasonable and should be approved by the Commission.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Direct Testimony of Justin R. Barnes
The Alliance for Solar Choice
DOCKET NO. 2014-246-E

EXHIBIT JRB-1

Justin R. Barnes

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EDUCATION

Michigan Technological University Houghton, Michigan
Master of Science, Environmental Policy August 2006
Graduate-level work in Energy Policy.

University of Oklahoma Norman, Oklahoma
Bachelor of Science, Geography, December 2003
Area of concentration in Physical Geography.

EXPERIENCE

EQ Research, LLC and **Keyes, Fox & Wiedman, LLP** Cary, North Carolina
Senior Analyst, March 2013 – present
Develop and manage solar and wind energy state regulatory policy tracking service that covers policies such as net metering, interconnection standards, rate design, renewables portfolio standards, state energy planning, state and utility incentives, tax incentives, and permitting. Responsible for service design, formulating improvements based on client needs, and ultimate delivery of bi-weekly reports to clients. Research pending renewable energy legislative policies for state policy tracking service. Research and summarize utility rate case filings for clients. Perform policy research and analysis to fulfill client requests, and for internal and published reports, focused primarily on state solar market drivers such as net metering, incentives, and renewable portfolio standards. Manage the development of a solar power purchase agreement (PPA) toolkit for local governments and the planning and delivery of associated outreach efforts.

North Carolina Solar Center, N.C. State University Raleigh, North Carolina
Senior Policy Analyst, January 2012-May 2013; *Policy Analyst,* September 2007-December 2011
Responsible for researching and maintaining information for the Database of State Incentives for Renewables and Efficiency (DSIRE), the most comprehensive public source of renewables and energy efficiency incentives and policy data in the United States. Managed state-level regulatory tracking for private wind and solar companies. Coordinated the organization's participation in the SunShot Solar Outreach Partnership, a U.S. Department of Energy project to provide outreach and technical assistance for local governments to develop and transform local solar markets. Developed and presented educational workshops, reports, administered grant contracts and associated deliverables, provided support for the SunShot Initiative, and worked with diverse group of project partners on this effort. Responsible for maintaining the renewable portfolio standard dataset for the National Renewable Energy Laboratory for use in its electricity modeling and forecasting analysis. Authored the *DSIRE RPS Data Updates*, a monthly newsletter providing up-to-date data and historic compliance information on state RPS policies. Responded to information requests and provided technical assistance to the general public, government officials, media, and the energy industry on a wide range of subjects, including federal tax incentives, state property taxes, net metering, state renewable portfolios standard policies, and renewable energy credits. Extensive experience researching, understanding, and disseminating information on complex issues associated with utility regulation, policy best practices, and emerging issues.

SELECTED ARTICLES and PUBLICATIONS

Barnes, J., Kapla, K. *Solar Power Purchase Agreements (PPAs): A Toolkit for Local Governments.* Pending Publication. For the Interstate Renewable Energy Council Inc. under the U.S. Department of Energy SunShot Solar Outreach Partnership.

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Barnes, J., C. Laurent, J. Uppal, C. Barnes, A. Heinemann. *Property Taxes and Solar PV: Policy, Practices, and Issues*. 2013. For the U.S. Department of Energy SunShot Solar Outreach Partnership.

Kooles, K, J. Barnes. *Austin, Texas: What is the Value of Solar. Solar in Small Communities: Gaston County, North Carolina. Solar in Small Communities: Columbia, Missouri.* 2013. For the U.S. Department of Energy SunShot Solar Outreach Partnership.

Barnes, J., C. Barnes. *The Report of My Death Was An Exaggeration: Renewables Portfolio Standards Live On*. 2013. For Keyes, Fox & Wiedman.

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Barnes, J., multiple co-authors. *State Solar Incentives and Policy Trends.* Annually for five years, 2008-2012. For the Interstate Renewable Energy Council, Inc.

Barnes, J. *Solar for Everyone?* 2012. Article in Solar Power World On-line.

Barnes, J., L. Varnado. *Why Bother? Capturing the Value of Net Metering in Competitive Choice Markets*. 2011. American Solar Energy Society Conference Proceedings.

Barnes, J. *SREC Markets: The Murky Side of Solar*. 2011. Article in State and Local Energy Report.

Barnes, J., L. Varnado. *The Intersection of Net Metering and Retail Choice: an overview of policy, practice, and issues*. 2010. For the Interstate Renewable Energy Council, Inc.

AWARDS, HONORS & AFFILIATIONS

- Solar Power World Magazine, Editorial Advisory Board Member (October 2011 – March 2013)
- Michigan Tech Finalist for the Midwest Association of Graduate Schools Distinguished Master's Thesis Awards (2007)
- Sustainable Futures Institute Graduate Scholar Michigan Tech University (2005-2006)