BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2014-246-E

In the Matter of: Petition to Establish Generic Proceeding Pursuant to the Distributed Energy Resource Program Act, Act No. 236 of 2014, Ratification No. 241, Senate Bill 1189	))))))))	DIRECT AND SETTLEMENT TESTIMONY OF JEFFREY R. BAILEY ON BEHALF OF DUKE ENERGY CAROLINAS, LLC AND DUKE ENERGY PROGRESS, INC

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Jeffrey R. Bailey and my business address is 1000 E. Main Street, Plainfield, Indiana 46168.

Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION WITH THE COMPANY?

A. I am Director, Rate Design and Analysis for Duke Energy and its affiliated utility operating companies.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I received Bachelor of Science degrees in Industrial Management and Engineering from Purdue University, West Lafayette, Indiana. I also received a Master of Science degree majoring in Industrial Engineering from Purdue University. I began my employment with Duke Energy in 1990 as Supervisor, Rate Engineering for PSI Energy, Inc. ("PSI") (now known as Duke Energy Indiana, Inc.). I was subsequently promoted to Manager, Rate Engineering in 1991. I held several positions in the Rate, Pricing, and Market Planning areas until 1997, when I accepted the position of Manager, Sales Analysis. In 2000, I joined the Financial Operations Department, where I held the positions of Manager, Financial Projects, and Manager, Finance. I returned to the Rate Department in 2002 as Manager, Pricing, and assumed my current position in October 2007.

Before joining PSI in 1990, I was employed by the Indiana Utility Regulatory Commission ("IURC"). I began my employment there in 1983 as a Staff Engineer. During my tenure with the IURC, I held several positions, progressively increasing in

responsibility, the last of which was Assistant Chief Engineer. My primary responsibility as Assistant Chief Engineer was the supervision of the gas and electric sections that investigated rate and regulatory matters pending before the IURC.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION OR OTHER STATE UTILITY REGULATORY COMMISSIONS?

A. I have testified before the Public Service Commission of South Carolina ("the Commission") in Duke Energy Carolinas' last three general rate cases in Docket Nos. 2009-226-E, 2011-271-E and 2013-59-E. I also have provided testimony on numerous occasions addressing rate design and other issues to the Indiana Utility Regulatory Commission, the Kentucky Public Service Commission, the Public Utilities Commission of Ohio, and the North Carolina Utilities Commission.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AS DIRECTOR, RATE DESIGN AND ANALYSIS?

A. My primary responsibility is to provide rate analysis and to develop the rates and charges contained in tariffs and contracts for gas or electric service for Duke Energy Corporation's ("Duke Energy") utility operating companies, including Duke Energy Carolinas ("DEC") and Duke Energy Progress ("DEP") (collectively, "the Companies").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to support the Settlement Agreement that the South Carolina Office of Regulatory Staff ("ORS"); Duke Energy Carolinas, LLC, Duke Energy Progress, Inc., South Carolina Electric & Gas Company (individually, the "Utility" and collectively, the "Utilities"); Central Electric Power Cooperative, Inc. and The Electric Cooperatives of South Carolina, Inc. (collectively, the "Coops"); South

Carolina Coastal Conservation League, the Southern Alliance for Clean Energy, the South Carolina Solar Business Alliance, LLC, Sustainable Energy Solutions, LLC, Solbridge Energy, LLC, and The Alliance for Solar Choice, (collectively, the "Solar Parties"); Nucor Steel-South Carolina; and Frank Knapp, Jr. (collectively, the "Settling Parties") have agreed upon, and to further support the implementation of the methodology proposed within the Settlement Agreement ("Methodology"), to identify, evaluate and quantify the relative benefits and costs of net energy metering ("NEM") in South Carolina and to identify any revenue gaps caused by NEM participation in the State.

II. CURRENT NEM DESIGN IN SOUTH CAROLINA

Q. PLEASE BRIEFLY DESCRIBE HOW NEM TARIFFS OPERATE IN SOUTH CAROLINA.

A. Current NEM tariffs were established in 2008 in Docket No. 2005-385-E at a time when utilities had limited experience with actual customer-owned generation. Concessions were made in the tariff design to not unduly discourage the installation of customer-owned generation and thereby allow the utility to gain insight into the system impact of customer-owned generation from both an administrative and operating perspective. There were few industry standards at that time that governed the operation of customer-owned generators and inverter designs. The NEM design allows a pure "1 for 1" offset of usage for any excess generation delivered to the utility grid. The offset is restricted to only apply to the corresponding or a lower-priced TOU period if the customer elected a TOU rate design for their retail service. Any excess usage that is not used in the current month to offset consumption is carried-forward to offset usage in the next or a future

month. Annually, the excess usage is reset to zero as an encouragement for the customer to properly size their generation to not exceed their retail consumption. The NEM tariff allows the customer to be served under any of the utility's available schedules for which they qualify. The tariff does not include recovery of higher administrative cost associated with serving NEM customers nor does it address any rate subsidies created by the design that shifts recovery of certain fixed costs for the utility's infrastructure to non-participating customers, specifically waiving standby charges for generation capacities of 100 kW or less.

Q. DO CURRENT NEM TARIFFS INCORPORATE AN EVALUATION OF THE BENEFITS AND COSTS OF NEM TO THE UTILITY, ITS PARTICIPATING CUSTOMER-GENERATORS AND ITS NON-PARTICIPATING CUSTOMERS?

A. No. As discussed above, consideration of the overall costs and benefits of NEM installations was deferred in 2008 until additional experience could be gained and the generation technologies could be more fully developed. It was recognized in 2008 that the "1 for 1" offset of usage was generous, but gaining real world experience was deemed to be highly valued, notwithstanding recovery of the cost impacts. At that time, the parties believed that setting rates to recover the full cost of serving NEM customers would impede development of the customer-generation market. It was also believed that the market potential for solar photovoltaic ("Solar PV") systems was relatively limited because it wasn't competitive with other more traditional generation resources; therefore, the financial exposure for other ratepayers was minimal.

III. OVERVIEW OF THE SETTLEMENT AGREEMENT AND IMPLEMENTATION OF THE BENEFIT-COST METHODOLOGY

Q. HOW DID ACT 236 IMPACT NEM IN SOUTH CAROLINA?

A. Act 236 codified the State's NEM policy into statute, increased the participation limits and also revised the compensation mechanism for excess energy credits at the end of a 12 month period, among other things. Importantly, for purposes of this proceeding, it also required the Public Service Commission of South Carolina to initiate the present generic proceeding "for purposes of implementing the requirements of this chapter with respect to the net energy metering rates, tariffs, charges, and credits of electrical utilities, *specifically to establish the methodology to set any necessary charges and credits* as required under items (1) and (2)." See S.C. Code § 58-40-20(F)(4)(emphasis supplied).

Q. HOW DOES THE PROPOSED RATE DESIGN IN THE SETTLEMENT AGREEMENT DIFFER FROM THE CURRENT NET METERING DESIGN?

A. For new NEM customers who interconnect by December 31, 2020, the proposed Net Metering rate design continues to offer the equivalent of a pure "1 for 1" offset of retail usage through December 31, 2025 for any generation, thereby, for the most part, extending the current rate design approach without change. Of course, the rate design will be updated to reflect the new conditions set forth in Act 236, such as payment for excess generation during an annual reconciliation. To accomplish this approach, an NEM Incentive, provided pursuant to the utility's distributed energy resource program ("DER Program"), is calculated to keep the Utility indifferent with respect to the overall change in revenues and costs and benefits of serving NEM customers. The DER NEM Incentive

will not appear on the customer's bill, but will be calculated and considered for recovery in the utility's next fuel clause proceeding.

Q. PLEASE DESCRIBE THE BENEFIT-COST METHODOLOGY PROPOSED BY THE SETTLING PARTIES IN THE SETTLEMENT AGREEMENT.

A. The benefit-cost methodology proposed by the Settling Parties is a multi-step approach to compute the extent to which the distributed energy resource ("DER") generation reduces the Utility's costs and to determine whether customer-generators using DER are providing their respective revenue requirements, which are based on the Companies' costs to serve such customers. This proposed solution has been designed to more accurately value DER generation, identify any revenue shortfall or surplus from NEM customer-generators and to provide a solution through the DER NEM Incentive or credits. The first step of the process requires the valuation of the DER generation, and the second step of the process requires the comparison of the customer-generator's revenue before and after the installation of the DER with the actual benefits delivered by the DER to determine whether a revenue shortfall or surplus exists.

Q. HOW IS THE CUSTOMER-GENERATOR'S DER GENERATION VALUED UNDER THE METHODOLOGY?

A. Attachment A to the Settlement Agreement provides the components through which the net value of DER generation is to be derived. It provides a standardized categorical approach to evaluating the benefits and costs of NEM generation by netting specific positive and negative values of certain components to arrive at a specific net value of the generation delivered. As more fully described by DEC and DEP witness Snider, the components represent the potential benefits or costs to the utility system and/or its

customers that are currently capable of quantification, or of possible quantification in the future. Such components may have positive, negative, or zero value and will be updated over time to reflect changing market dynamics and operating conditions to provide accurate valuations. The specific components of benefit or cost that should be reflected in the ORS Methodology include: (1) Avoided Energy, (2) Energy Losses/Line Losses, (3) Avoided Capacity, (4) Ancillary Services, (5) Transmission and Distribution ("T&D") Capacity, (6) Avoided Criteria Pollutants, (7) Avoided CO2 Emission Cost, (8) Fuel Hedge, (9) Utility Integration & Interconnection Costs, (10) Utility Administration Costs and (11) Environmental Costs.

Q. IS THIS A REASONABLE AND APPROPRIATE APPROACH TO VALUE DER GENERATION?

A. Yes. Proper consideration of these cost components will identify changes in the Company's actual cost of serving NEM customers. This will allow proper assignment of these costs and benefits to both NEM customers and to non-participating customers.

Q. ONCE THE COST/BENEFIT VALUE OF THE DER GENERATION HAS BEEN CALCULATED, HOW WILL THE COMPANIES USE THAT VALUE IN THE SECOND STEP IN THE PROCESS?

A. As set forth in the Settlement Agreement, DEC and DEP will then use the value of the DER generation as a component of the Methodology to compute the net estimated under-recovered or over-recovered revenue from NEM customer-generators. The calculation process, to determine the under-recovered or over-recovered revenue from the NEM customer-generator, is as follows:

i. Compute what a representative customer's bill would have been under the applicable standard rate, without consideration of the production of the DER resource.

ii. Subtract from that amount the representative customer's estimated bill under the applicable standard rates with consideration of the production of the DER resource.

iii. Subtract from that amount the net benefits delivered by the DER resource as computed according to the Methodology and based upon the production of the DER Resource.

iv. If the final number is positive, the result is the "Under-recovered Revenue from the NEM Customer."

v. If the final number is negative, the result is the "Over-recovered Revenue from the NEM Customer."

Q. HOW IS THE UNDER- OR OVER-RECOVERY AMOUNT USED TO ESTABLISH THE DER NEM INCENTIVE TO BE RECOVERED IN THE ANNUAL FUEL ADJUSTMENT PROCEEDING?

A. The net under-recovered or over-recovered revenue would next be used to establish an "Incentive Rate" per kW of installed capacity that would then be applicable to all NEM generation installed under the rate schedule. It is important to note that since each utility's rate design structures differ that a unique solar rate will apply to each retail rate schedule. The "Incentive Rate" applicable under each rate schedule would be updated annually concurrent with each Company's fuel adjustment proceeding. The DER NEM

Incentive amount that would be subject to recovery in the fuel adjustment proceeding would be the "Incentive Rate" times installed NEM capacity in kW.

Q. CAN YOU PROVIDE AN EXAMPLE OF THE INCENTIVE RATE CALCULATION?

A. An example of how this calculation will work using Duke Energy Carolinas' Residential Service Schedule RS has been provided as Bailey Direct Exhibit 1.

Q. PLEASE EXPLAIN WHAT THESE RESULTS WILL ACTUALLY MEAN TO NEM CUSTOMER-GENERATORS.

A. The results effectively yield either a shortfall or surplus of the revenue requirement for each NEM customer-generator predicated on size of the generator, depending primarily upon the retail tariff design. Over time, that shortfall or surplus summed over all participant customers represents the amount of the net "cost-shift" from NEM customer-generators to non-participating customers or from non-participating customers to NEM customer-generators. In the event of an "under-recovered revenue" result, the NEM customer-generator would need to supply additional revenue to the utility to avoid being subsidized by other non-participating customers. In that scenario, in essence, the costs to serve that NEM customer-generator outweigh the benefits being delivered by that NEM customer-generator. On the other hand, in the event of an "over-recovered revenue" result, the exact opposite is true, and the NEM customer-generator would be entitled to a credit to reflect that it was providing benefits to the system in excess of the utility's revenue requirement. As noted above, this calculation would be performed for each rate schedule with the derived "Incentive Rate" applying to all customer-generators served under the selected rate schedule.

Q. PLEASE EXPLAIN WHY THE COMPANIES CAN USE A REPRESENTATIVE CUSTOMERS' BILL IN LIEU OF ACTUAL BILLS?

A. The use of a representative customer for each rate class to establish revenue and cost effects is a commonly accepted ratemaking approach and is therefore appropriate in this proceeding. Utilities establish rates using an average ratemaking approach by grouping customers with similar usage characteristics and costs of service into individual rate classes. For use in this proceeding, metering information supplied by the utility's Load Research group has been used to create a representative customer load shape for each rate class.

Q. ON WHAT WILL THE COMPANIES' ESTIMATES OF DER PRODUCTION BE BASED?

A. The load shape or usage profile of a stationary Solar PV system is relatively easy to establish since it is based upon the availability of sunshine; however, it is influenced by a number of factors including, but not limited, the latitude of the installation, degree of cloud cover, age of the equipment, degree of environmental contamination on the panel due to exposure, operational and equipment issues, inverter efficiency, the installation direction and panel tilt, and the effect of tree cover that changes over time. For roof-top installations, many of these factors are beyond the customer's control, but should be considered in the production estimates. Hourly load profiles of DER generation should be developed based upon utility-specific or industry data that takes these factors into consideration. The profiles used by the Company incorporate these factors.

Q. THIS APPROACH FOCUSES ON THE RESPECTIVE REVENUE REQUIREMENTS OF CUSTOMER-GENERATORS. IS THIS REFLECTIVE OF THE COSTS TO SERVE THESE CUSTOMER-GENERATORS?

A. Yes. The proposed approach presumes that the current revenue, before the installation of generation, adequately recovers the Company's cost of service; therefore, the Net Metering customer's bill should only be lower by the overall change in the cost and benefits realized by the Company and non-participating customers.

Q. IN ESSENCE, IS A SHORTFALL RESULTING UNDER THE METHODOLOGY INDICATIVE OF THE CUSTOMER-GENERATOR'S FAILURE TO PAY THE FULL UTILITY COSTS INCURRED TO SERVE THAT CUSTOMER AND IS A SURPLUS RESULT INDICATIVE OF THE OPPOSITE?

A. Yes. Unless the cost impact of the shortfall is addressed at the time of the generator installation, it will reduce Company revenues and will be required to be recovered from non-participant customers in the Company's next general rate case. Similarly, if a surplus exists it would result in the Company realizing greater than its full cost of service until its next rate case, allowing non-participant customers to enjoy lower rates than could be fully justified.

Q. AND IS IT YOUR OPINION THAT ANY CHARGES OR CREDITS RESULTING FROM THIS METHODOLOGY WILL ULTIMATELY ALLOW THE COMPANIES TO RECOVER ITS COST OF PROVIDING ELECTRICAL SERVICE TO NEM CUSTOMER-GENERATORS AND CUSTOMERS WHO ARE NOT CUSTOMER-GENERATORS?

A. Yes, the financial position of the Companies will be unchanged over the long-term if the Company recovers the change in revenue, costs and benefits contemplated with the Settlement methodology. In addition, non-participant customers should be indifferent, as they would pay for or receive an appropriate value based on the proper valuation of customer generation.

Q. IS IT CORRECT, FOR PURPOSES OF SETTLEMENT, THAT THE COMPANIES HAVE AGREED NOT TO ASSESS THESE SPECIFIC CHARGES ON NEM CUSTOMER-GENERATORS FOR A SPECIFIED PERIOD.?

A. Yes, for purposes of settlement in this proceeding, the Companies have agreed to forego recovery of the costs identified through the methodology from new NEM customer-generators until December 31, 2020 to incent the installation of DER and will instead consider the DER NEM Incentive as a DER program expense to be recovered in the utility's fuel clause proceeding from all ratepayers. The Settling Parties believe that this approach is permissible and consistent with the requirements of Act 236.

Q. WHAT ACCOUNTING AND RATEMAKING TREATMENT IS APPROPRIATE FOR THE NEM INCENTIVE?

A. Recovery of the DER NEM Incentive is subject to the rate caps and allocation treatments specified in Act 236 which will control and limit the amount immediately collected in rates. The proposed accounting and ratemaking will be unique to each utility and therefore should be deferred for discussion until the utility files its proposed Net Metering tariff.

IV. CONCLUSION

Q. DO THE COMPANIES BELIEVE THE SETTLEMENT AGREEMENT PRESENTS A REASONABLE AND EQUITABLE APPROACH TO IDENTIFYING AND EVALUATING THE BENEFITS AND COSTS OF NEM GENERATION?

A. Yes. The Companies believe that the intent of Act 236 is to facilitate increased deployment of DER in South Carolina. DEC and DEP believe that providing a temporary incentive to encourage renewable generation installations is appropriate to meet this objective, provided NEM customers recognize that they will ultimately be responsible for any revenue shortfall after January 1, 2025.

Q. DO YOU ALSO BELIEVE THE SETTLEMENT AGREEMENT PROVIDES A REASONABLE AND ACCURATE METHOD TO IDENTIFY ANY UNDER-RECOVERY OR OVER-RECOVERY OF COSTS TO SERVE NEM CUSTOMER-GENERATORS?

A. Yes, the Methodology within the Settlement Agreement accurately identifies the under-recovery/over-recovery of the cost to serve NEM customer-generators. This includes both short- and long-term cost. It also offers sufficient time to further study and refine costs and benefits before establishing an appropriate rate to be paid by the NEM customer beginning in 2021 for new NEM customers or 2025 for grandfathered NEM customers.

Q. AS SUCH, DO DEC AND DEP SUPPORT THE COMMISSION'S APPROVAL OF THE SETTLEMENT AGREEMENT AND METHODOLOGY AS CONSISTENT WITH THE REQUIREMENTS OF ACT 236, AND ALSO IN THE PUBLIC INTEREST?

A. Yes, we do.

Q. DOES THIS CONCLUDE YOUR DIRECT AND SETTLEMENT TESTIMONY?

A. Yes.

Sample Calculation of Net Metering DER NEM Incentive

Description of Step	Cost Assumption	Monthly Revenue Impact
Step 1: Compute a representative customer's bill under the applicable standard rate, without consideration of the production of the DER resource	For purposes of this example, assume a residential customer using 1,000 kWh per month under Duke Energy Carolinas, Residential Service Schedule RS (SC) *effective November 1, 2014*	$116.89
Step 2: Subtract from that amount the representative customer's estimated bill under the applicable standard rates with consideration of the production of the DER resource	Assumed installation of a 4 kW Solar PV system producing 422 kWh per month. Residential bill for 578 kWh under Schedule RS (SC)	Subtract $71.06 *(Customer Bill Savings of $45.83, Step 1 Bill less Step 2 Bill)*
Step 3: Subtract or add from that amount the net cost/benefit delivered by the DER resource as computed according to the Methodology and based upon the production of the DER Resource	Assume a Net Cost/Benefit of 6 cents per kWh with a 4 kW Solar PV system producing 422 kWh per month or $25.32 net benefit	Subtract $25.32 *(6 cents per kWh net cost/benefit X 422 kWh of generation)*
Step 4: Over or Under Recovery Amount		Net Shortfall of $20.51 *(Step 1 Bill less Step 2 Bill less Step 3 Net Costs/Benefit)*
Step 5: Incentive Rate		$5.13 per installed kW of Solar PV generation *(Step 4 Revenue Shortfall divided by Installed kW of Capacity)*

NOTE: This calculation is unique to each rate schedule under which retail electric service is requested; therefore, the Incentive Rate will vary based upon the rate schedule under which the NEM customer-generator is served. In the event that actual solar production is used, the net shortfall may be expressed in cents per kWh of production, or some other reasonable metric to be determined by the Company.