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December 1, 2016

VIA ELECTRONIC FILING

The Honorable Jocelyn G. Boyd
Chief Clerk/Administrator
Public Service Commission of South Carolina
101 Executive Center Drive, Suite 100
Columbia, South Carolina 29210

Re: **Joint Application of Duke Energy Carolinas, LLC,
Duke Energy Progress, LLC and South Carolina
Electric & Gas Company for Approval of the Revised
South Carolina Interconnection Standard
Docket No. 2015-362-E**

Dear Mrs. Boyd:

Please find enclosed for filing the Responsive Statement of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC in regard to the to the Workshop scheduled in the above-referenced docket.

Should you have any questions regarding this matter, please do not hesitate to contact me at 803.988.7130.

Sincerely,

A handwritten signature in blue ink that reads "Rebecca Dulin".

Rebecca J. Dulin

Enclosure

cc: Parties of Record

RESPONSIVE STATEMENT OF DUKE ENERGY CAROLINAS, LLC, AND DUKE ENERGY PROGRESS, LLC IN REFERENCE TO WORKSHOP REGARDING THE EFFECT OF THE INTERCONNECTION STANDARD IN COMPLYING WITH THE DISTRIBUTED ENERGY RESOURCES ACT IN DOCKET NO. 2015-362-E

I. INTRODUCTION

Pursuant to Order No. 2016-658, the Commission's Notice of Workshop issued September 28, 2016, and Amended Notice of Workshop issued September 29, 2016, Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP," collectively with DEC, the "Companies") submitted a direct statement to the Commission regarding the Companies' progress toward the requirements of the South Carolina Distributed Energy Resources Program Act ("Act 236") and their progress and the challenges associated with interconnecting third-party solar generation on November 10, 2016. Herein, the Companies provide a brief responsive statement, which provides comments on several topics raised by South Carolina Electric & Gas Company ("SCE&G") in its direct statement filed in this docket.

II. RESIDENTIAL CONSUMER AND INDUSTRY CHALLENGES

In the testimony of John Raftery, SCE&G raises concerns regarding improper business practices of certain entities that sell or lease solar facilities to homeowners. The Companies have had similar experiences with entities that sell, lease, market, and/or install residential solar facilities.¹ In spite of the Companies' best efforts to advise customers, the best efforts of a number of truthful, veteran solar installers based in South Carolina, and the efforts of the Office of Regulatory Staff to register solar lessors in the state, certain residential solar businesses have overpromised and/or misrepresented information to customers, misrepresented themselves and

¹ Herein, the Companies generally refer to entities that sell, lease, market, and/or install residential solar facilities as "solar companies" or "solar businesses." A solar marketer refers to the salesperson and his/her business who reaches out to the homeowner initially through mailers/fliers, targeted social media, telemarketing, or other means, to suggest the installation of a solar facility on a customer's premises. The solar marketer is the company that conducts the "kitchen table" conversation with the customer and that is generally responsible for earning the customer's trust and convincing him/her to purchase or lease the solar facilities. These companies are often independent of and/or subcontractors of the company that conducts the construction of the actual solar facility, typically called the "solar installer." The segmentation of the solar industry is relevant because it is in the marketing of solar where there is the greatest possibility of overpromising and/or misrepresenting information to the vulnerable customer.

their relationship with the utility, and unsafely installed solar facilities at customer premises. While these instances are the exception and not the norm, the seriousness of these incidents are worthy of discussion in this workshop if only to shed light on relative vulnerability of the retail customer to solar scams.

For example, through the Companies' Renewable Service Center, the Companies have catalogued a number of instances in which homeowners have been told that solar power would eliminate the customer's electricity bill. A cursory search of the Internet of key words or phrases, such as, "South Carolina eliminate your electricity bill" yields an abundance of instances where residential solar companies in South Carolina are exaggerating the promise of solar. While not every customer reaches out to the Companies to verify these promises, those who do will speak to a Renewable Service Center professional. In addition to explaining that the "zero bill" is a myth, our representatives walk the homeowner through their electricity usage history, explain the concepts of the basic facilities charge, of net metering, and how to calculate the output of a solar facility. On average, our professionals have three, 15-20 minute phone conversations, in addition to email exchanges, with homeowners prior to their installations of solar panels.

Additionally, similar to SCE&G, the Companies have been made aware of situations where such businesses are representing themselves as the utility. A frequently heard refrain from customers is whether a solar marketer or installer is indeed a "partner" of Duke Energy (as the marketer claimed) or, more seriously, whether it was actually a Duke Energy representative who knocked on their door. Renewable Service Center professionals are often explaining to customers that the Companies neither market solar directly to residential customers nor do they partner with particular solar firms in South Carolina.

The Companies also have concerns as to whether accurate information is always given to customers by residential solar companies to enable such customers to make informed decisions about the impact of a rooftop solar installation. Each month, the Companies receive information that suggests that *some* homeowners have not been given accurate information. For example, a residential customer may call us to verify that a financial estimate provided by a solar marketer is correct. While our professionals are not tasked with verifying financial estimates, they do spend significant time helping customers understand what questions they should be asking the solar marketer and what assumptions underlie the financial benefit projection provided by a solar marketer.

By way of example, Exhibit 1 is an actual financial benefit projection provided by a solar marketer to a DEC residential customer on October 23, 2016. This projection was volunteered to DEC by a homeowner who asked a local DEC whether the information provided was accurate. Upon examination of the quote and estimated savings, there are a number of material issues with the estimate. As shown in the margins of the exhibit, the solar marketer has:

- i. Inflated the price to install solar. A reasonable price to install solar in South Carolina is approximately \$3.50 per watt-DC rather than \$5.05 per watt-DC stated in the estimate. Inflation of the total cost of the solar equipment correlates to larger government tax incentives for the customer.
- ii. Assumed a very aggressive retail electricity price inflation of 7.5% per year. A more reasonable approach would assume that retail electricity prices increased at the rate of inflation or 2%.
- iii. Included in the cost to install solar the energy efficiency improvements. As information, incentives for solar, such as the Federal Investment Tax Credit and the South Carolina

Solar Energy Tax Credit, are calculated as a percentage of qualified *solar electric property expenditures* not energy efficiency expenditures. If the customer were to claim the Federal and or state tax credit for solar and were to be audited, the customer may find himself or herself unwittingly in violation of state and/or federal tax code, both of which limit the application of tax credits to *solar electric property expenditures*.

Duke Energy provides this analysis not to suggest that the business of solar marketing or solar installation is plagued with bad actors, but instead to illustrate that for a homeowner to make an informed decision on whether a solar facility is indeed a “good” investment, quite a few assumptions must be examined and questioned. One could argue that each of the inaccuracies shown in Exhibit 1 are merely minor errors, but the compounding of each of these errors has the effect of misleading the customer. Overstating the retail electricity price increases by a factor of 3.5 will lead the customer to expect the future “value” of the electricity generated by the solar facility and net metered against the utility’s retail rate will be much greater than to the customer will ever practicably realize in the future. Whereas a homeowner may be well-equipped to evaluate other major investments, such as a refrigerator, television, or even a car, solar electric power generation investment is complex. The value of the investment hinges on the accuracy of a half-dozen factors, many of which require basic knowledge of how solar power generation works.

Finally, with regard to the quality of the installations being conducted by residential installers, our Renewable Service Center representatives, field inspectors, and meter technicians have found errors in wiring of solar facilities at approximately 100 residential solar facilities.² In each of these cases, the Companies worked with the solar installer to take corrective action. The

² As information, Duke Energy’s field inspectors examine only those facilities greater than 10 kilowatts in size; county inspectors examine facilities less than 10 kilowatts in size.

issues range from the relatively simple (e.g., one-line does not match the wiring of the actual installation or equipment stated in interconnection application does not match equipment actually used) to more serious issues that have potential safety consequences (e.g., AC disconnect switch not placed in correct location). Several of these issues are the result of an infant industry, some of the issues are a result of the segmented nature of the solar marketing and installation business, and still other errors found during inspection are human errors.

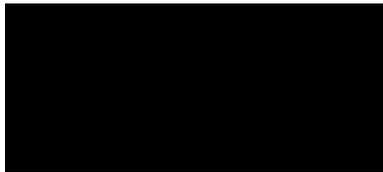
Through the Companies' continued education and outreach efforts, targeted at both customers and industry, the Companies work toward minimizing the issues described above. Like SCE&G, the Companies also believe support from organizations like the South Carolina Solar Business Alliance and South Carolina Solar Council is critical in this area.

Respectfully submitted this 1st day of December, 2016.



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Executive Summary

Electric Utility Savings: Anticipate savings of approximately \$1,725 in electric bills (83%) at current utility rates in the first year. These savings will grow as electric utility rates rise. The purchase of electric energy (kWh) from your utility is expected to be reduced by 83%.

Over 25 years, annual utility savings should average \$5,021, for a total utility savings of \$125,514.

Annual Performance Summary

Energy Efficiency Improvements: Energy Package (10-LED, SURGE, (NEST), Air Seal in attic and lights, light tents, blown insulation, water heater blanket). Reduce annual energy use by 30%

Solar Electric (PV) System: 6.72 kW DC (6.552 kW AC) producing 10,001 kWh/Year

COMMENT 2:

\$33,936 is an inflated price for this stated amount of residential solar capacity. (\$33,936 ÷ 6.72 kW = \$5.05 per watt-DC.) A reasonable price to install solar in South Carolina is approximately \$3.50 or less per watt-DC, quite a bit lower than the \$5.05 per watt-DC stated in this estimate.

Purchase Price & Net Cost

Gross Price:	\$33,936
Incentives to Contractor:	(\$6,720)
Contract Price:	\$27,216
Incentives to Customer:	(\$13,681)
Income Tax on Incentives:	\$3,026
Net Purchase Cost:	\$16,561
Incentives in Later Years:	(\$4,735)(Total)

Financial Ratios (Unlevered)

Customer's Profitability Index:	5.2
Internal Rate of Return (IRR):	16.7%
Cash Gained over Life:	\$102,252

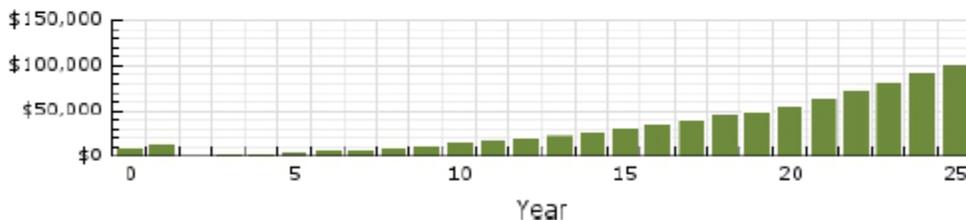
COMMENT 1:

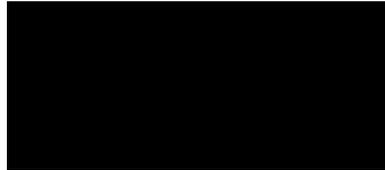
"Incentives to Contractor" is misleading. The \$6720 represents the value of the Solar Rebate; the customer may assign this rebate to the contractor; the rebate does not automatically go to the contractor.

- Property Value Appreciation: \$37,080 (first-year utility savings x 20 years)
- CO2 Saved over System Life: 321 tons. Equivalent to driving 642,000 auto miles

Finance: Loan: "Interest-Only". \$27,249 at 5.990% apr. for 18 months. Interest payments: \$136 monthly over 18 months. Interest not tax deductible. Loan: "Fully-Amortized". \$13,535 at 5.990% apr. Repaid: \$10 monthly over 222 months. Commences month 18. Interest not tax deductible. Initial Cash Proceeds: \$13,714.

Cumulative Cash Flow





The Cost of Doing Nothing

Utility Cost over Time



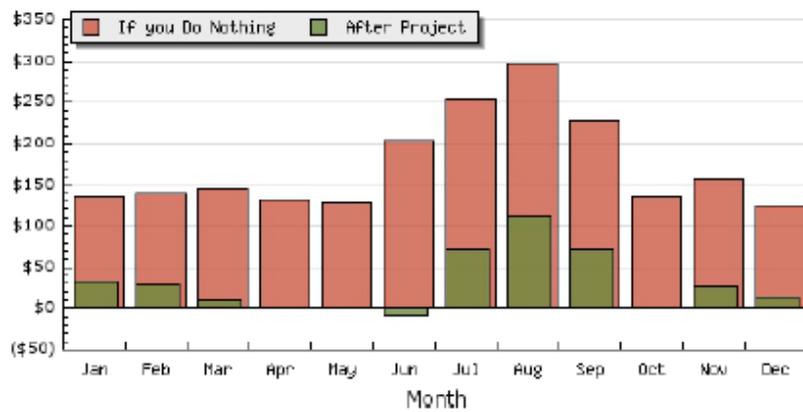
COMMENT 3:
This is incorrect. Per Rider RNM, it is in the March billing period that the customer is compensated at avoided cost for any accrued net excess generation.

Your Hedge Against Utility Inflation: Your investment in this project will protect you from utility rate inflation.

Utility Cost by Month

June includes a Net-Metering "True-Up" payment to reconcile any net-meter credits accumulated over the prior year.

Utility Cost by Month (typical): Reduced 83%

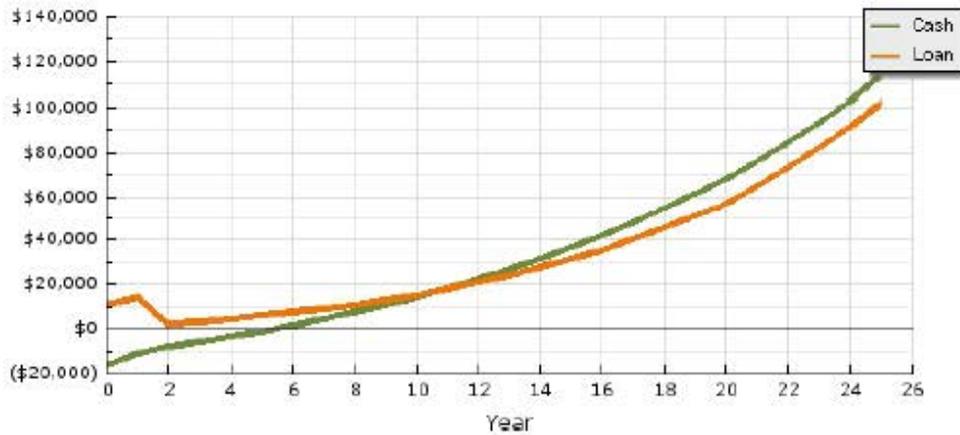




Finance Options

	Cash Scenario	Loan Scenario
Net-Cash at Install (invested or received):	(\$16,561)	\$10,688
Incentives in Later Years:	\$4,984	\$4,984
Wealth Created Over System Life (NPV):	\$66,432	\$57,145
Cash Gained Over System Life:	\$113,587	\$102,252
Return on Initial Cash Invested (IRR):	21.2%	16.7%
1st-Year Utility Savings Less Finance Payments:	\$1,854	\$222
Property Value Appreciation:	Yes	Yes

Cumulative Cash Flow of Finance Options



Terms of Finance Options:

Loans:

Loan: "Interest-Only". \$27,249 at 5.990% apr. for 18 months. Interest payments: \$136 monthly over 18 months. Interest not tax deductible.

Loan: "Fully-Amortized". \$13,535 at 5.990% apr. Repaid: \$101 monthly over 222 months. Commences month 18. Interest not tax deductible.

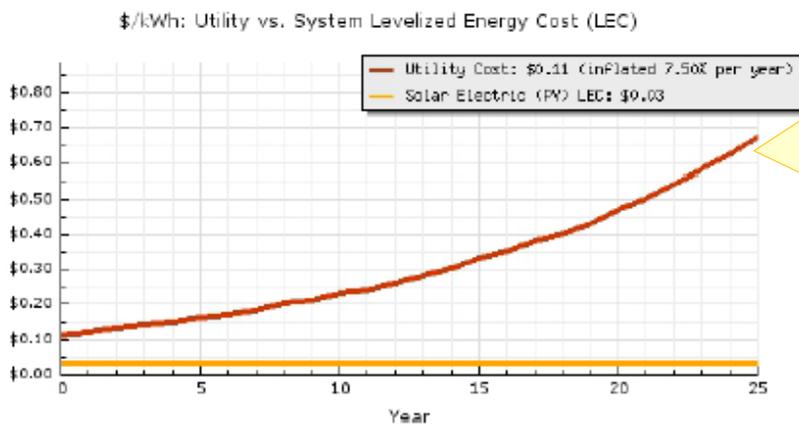




Levelized Energy Cost (LEC)

Your Hedge Against Utility Inflation: Your investment in this project will protect you from utility rate inflation. Levelized Energy Cost (LEC) analysis provides us with a "hurdle rate" (the levelized energy cost) which can be compared to the expected change in utility rates (by way of utility rate inflation). LEC is the average lifetime cost of energy produced by a particular system. We can compare the LEC to the current utility rate and its expected change in price as time goes on. In this manner one can judge the investment as a "better bet" than utility rates to contain energy costs. Represented below is the average cost of utility energy versus the cost of energy produced (LEC) by your system over time.

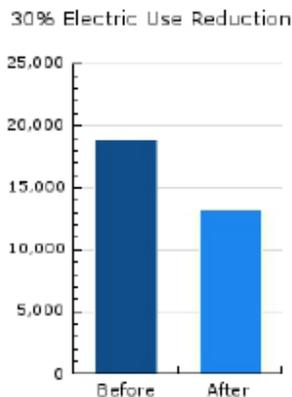
Electric: Levelized Energy Cost (LEC)



COMMENT 4: This graphic is misleading. A retail electricity price inflation rate of 7.5% per year is aggressive. A more reasonable approach would assume that retail electricity prices increased at the rate of inflation or 2%.



Energy Efficiency Summary



Energy Efficiency Improvements

Energy Package (10-LED,SURGE, (NEST), Air Seal in attic and lights, light tents,blown insulation, water heater blanket). Reduce annual energy use by 30%

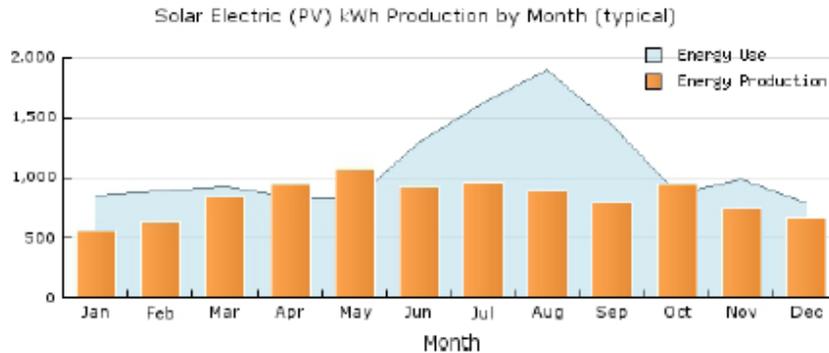
Contract Price Summary: Energy Efficiency Improvements

No cost for energy efficiency improvements.

COMMENT 5:
 "No Cost for Energy Efficiency Improvements" (such as the "Energy Package" mentioned above) explains why the cost per Watt-DC figure (see Comment 1) is so high. Incentives for solar, such as the Federal Investment Tax Credit and the South Carolina Solar Energy Tax Credit, are calculated as a percentage of *qualified solar electric property expenditures* not energy efficiency expenditures. The solar marketer appears to be passing off energy efficiency improvements as a cost to install solar. If the customer were to claim the Federal and or state tax credit for solar and were to be audited, the customer may find himself or herself unwittingly in violation of state and/or federal tax code, both of which limit the application of tax credits to solar investments.



Solar Electric (PV) System Summary



Total Panel Area: 431 sq-ft
 System Peak Power: 6.72 kW DC (6.552 kW AC, 6.007 kW CEC)
 Annual Production: 10,001 kWh. Supplying 53% of annual electric use

PV Panels:

24 x Hanwha Q-Cells, Model: Q.PLUS BFR G4.1 280. Tilt: 30° Azimuth: 225° 3" Air Gap. Shade reduces production: 0%

Inverters:

1 x SolarEdge Technologies, Model: SE5000 (240V)

Included:

DESIGN AND PERMITTING:
 * DESIGN AND PERMITTING

Contract Price Summary: Solar Electric (PV) System

Gross Price: \$33,936 (\$5.05/watt DC)

Incentives to be received by Contractor in 1st Year

Duke Energy Carolinas Customer Scale Rebate Program: (\$6,720)
 PV \$1/watt DC:

Contract Amount: \$27,216

Incentives available to Customer in 1st Year

South Carolina Solar Energy Tax Credit (25% of Cost, \$3.5k (\$3,500) max per year. \$35k max over 10 years):

Federal Tax Credit (30% of Gross Cost at Installation): (\$10,181)

Net Cost at Install (after incentives): \$13,535

Net Installed Price per Watt: \$2.01/watt DC (\$2.07/watt AC)

Note: Income Tax may be due on some incentives: \$3,026

Total Incentives available to Customer in Later Years: \$4,984

* - South Carolina Solar Energy Tax Credit (25% of Cost, \$3.5k max per year. \$35k max over 10 years)

COMMENT 7:

Please see Comment 5 regarding the applicability of tax credits to qualified solar electric property expenses and the questionable inclusion of energy efficiency improvements in the gross price.

