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VIA HAND DELIVERY

October 10, 2008

Ms. Renne C. Vance
Chief Clerk
The NC Utilities Commission
4325 Mail Service Center
Raleigh, NC 27699-4325

Re: Testimony in Docket No. E-7, Sub. 856

Dear Ms. Vance:

Enclosed please find the original and 30 copies of The Vote Solar Initiative's Testimony in Docket No. E-7, Sub. 856. I have served the enclosed Testimony on all parties to this proceeding.

Thank you for your assistance with this filing.

Very truly yours,

R. Sarah Compton

R. Sarah Compton, Esq.

Counsel for The Vote Solar Initiative

Full Dist.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 856

Application of Duke Energy Carolinas, LLC	)	DIRECT TESTIMONY OF
For Approval of Solar Photovoltaic	)	THOMAS J. STARRS
Distributed Generation Program	)	ON BEHALF OF THE
And for Approval of Proposed Method of	)	VOTE SOLAR INITIATIVE
Recovery of Associated Costs	)	

INTRODUCTION

The Vote Solar Initiative is pleased to provide testimony to the North Carolina Public Utilities Commission in the above referenced case. Our testimony, presented by Tom Starrs, follows. In addition to this testimony, The Vote Solar Initiative also supports the testimony submitted by The Solar Alliance.

Q: Please state for the record your name, position, and business address.

A: My name is Dr. Thomas Starrs. I am currently self-employed as an independent consultant. My consulting practice is focused on solar energy business development, market analysis and policy advocacy, with an emphasis on both distributed- and utility-scale solar power development. My business address is 5808 SW 41st Avenue, Portland OR 97221.

Q: Please describe your experience and qualifications.

A: I have 25 years of academic and professional experience in renewable energy. My recent career experience includes senior management positions with PPM Energy/Iberdrola Renewables, one of the nation's largest developers of utility-scale wind and solar projects; with the Bonneville Environmental Foundation, a not-for-profit organization dedicated to renewable energy and watershed restoration that funds its mission primarily through the sale of renewable energy certificates (RECs); and Schott Solar, a leading global manufacturer of solar photovoltaic cells and modules. Prior to holding these positions, I spent seven years as an independent consultant in support of the design and implementation of net metering and streamlined interconnection requirements across the United States. In addition, I have served on the board of directors of the American Solar Energy Society, the Prometheus Institute, the Solar Alliance, and the Solar Energy Industries Association. I am on the Advisory Board of The Vote Solar Initiative (Vote Solar) and have been retained by Vote Solar to review Duke Energy Carolinas LLC (Duke) Application and analyze the issues contained therein. My experience and qualifications are described in Exhibit 1, attached hereto.

Q: Please summarize the recommendations you present in this testimony.

A: My testimony recommends that the North Carolina Utilities Commission (NCUC) expand the options for compliance with the Renewable Energy and Energy Efficiency Portfolio Standard's (REPS) solar requirement by requiring that Duke also provide a standard offer for RECs. At a minimum, the Commission should require that Duke determine a long-term contract price for the solar RECs obtained through this program, and make that same price available to third-party customers alongside the Duke-provided program. Such a program would expand the options available to Duke for meeting its REPS obligations; provide Duke with an alternative mechanism for meeting its solar energy resource goals, potentially at a lower cost; and would create a more competitive framework for solar energy investment in North Carolina, better enabling the Commission to evaluate the effectiveness of the Duke program.

Q: Does Vote Solar support elements of Duke's Proposal?

A: Vote Solar is supportive of many elements of Duke's Proposal to expand into solar photovoltaic (PV) generation. Vote Solar applauds Duke's commitment "to supporting the development of solar PV technology into a flourishing and self-sustaining industry that can complement more conventional technologies to supply the electricity needs of the Company's customers." (Duke Application (Duke App.) at 2.)

Vote Solar also commends Duke Energy's recognition that "distributed energy could offer solutions to some of the nation's pressing energy and electric power

problems, including power quality issues, tighter emissions standards, and transmission bottlenecks." (Duke App. at 3.)

Q: What changes to the Duke Proposal does Vote Solar recommend?

A: The Duke Proposal—purchasing and installing solar systems throughout the company's service territory—represents one potential path by which the utility can achieve compliance with the solar requirement of the REPS. There is another possible approach. Instead of purchasing solar systems outright, Duke could purchase the solar RECs from customers choosing to install solar systems that are designed principally to generate electricity to serve their own loads. Vote Solar recommends that NCUC require Duke to also support customer-sited and customer-owned solar generation by establishing a solar REC purchase program.

Q: What are the advantages of the approach Vote Solar recommends?

A: The advantages are several. First, this approach leverages significant private investment, potentially reducing costs to ratepayers. Under this approach, a utility customer would put up its own capital to install a solar system and use the electricity generated by the system to meet its own facility needs, thereby offsetting part of the electricity it otherwise would purchase from Duke. The primary value of the system to the customer would come from these avoided utility purchases. In addition, the utility would purchase the associated RECs from the customer and use the RECs for REPS compliance purposes. The combination of the cost savings (from avoided utility purchases) and the revenue stream (from the sale of RECs to the utility) are likely to make the solar system economics attractive enough to stimulate direct customer investments in solar

power projects. As a result, more solar power generating capacity may be installed for the same ratepayer investment...

Second, the approach recommended by Vote Solar will allow Duke customers to enjoy other benefits of serving their own electricity demand. In addition to reducing utility bills, these benefits include fixing future energy costs, hedging against future rate increases, demonstrating and supporting their environmental values, and contributing directly to a safer and more secure energy future. These benefits of self-generation have proven quite popular in other states, including California, Colorado, Connecticut, New Jersey, and Oregon.

Third, Duke states that one of the goals of its proposed program is to support "the development of solar PV technology into a flourishing and self-sustaining industry that can complement more conventional technologies to supply the electricity needs of the Company's customers." (Duke App. at 2.) Under Duke's Proposal, solar is treated as a wholesale generating resource, and competes with other wholesale resources. Under Vote Solar's proposal, solar systems would deliver electricity on the customer side of the meter, displacing retail electricity purchases. One significance of the difference is that under Vote Solar's proposal, solar no longer needs incentives once it can deliver electricity at retail grid parity. Under Duke's proposal, the relevant benchmark is a marginal wholesale rate—a more difficult economic proposition for making solar power economically viable, since wholesale rates typically fall substantially below comparable rates.

Q: Does a standard REC offer provide more certainty regarding the amount of PV generation acquired in return for a commitment of ratepayer funds?

A: Yes. With a standard REC offer, ratepayer funds are used to buy RECs from a customer generator over a specified contract period. The price is paid to the customer-generator only after the PV electricity is generated. A REC offer guarantees that ratepayer funds support actual systems producing actual electricity on a "pay for performance" basis, rather than rewarding utility investment in generating equipment that may or may not perform in accordance with expectations.

Q: Are there precedents in other states for the approach Vote Solar recommends?

A: Yes. Twelve states, in addition to North Carolina, have renewable energy standards that include specific requirements for solar. Several of these states have adopted Vote Solar's proposed approach, requiring utilities to purchase solar RECs from non-utility customer-generators as a mechanism for achieving compliance.

Q: Is Vote Solar providing any evidence to support its contention regarding ratepayer benefits?

A: Yes. In response to Duke's application, Vote Solar undertook an analysis of the economics of a hypothetical 200 kW PV installation on the roof of a big-box store in the Raleigh area to determine what REC price would be necessary to incentivize customer investment in self-generation for solar. This analysis provided in Exhibit 2 attached hereto.

Vote Solar then extrapolated the results to compare the amount of solar that could be incentivized under the two different approaches for the same $100 million dollars investment. The very significant result is provided in Exhibit 3 attached hereto.

Q: Can you explain Exhibit 2?

A: Yes. Vote Solar used the 'OnGrid Solar Financial Analysis Tool', a widely used commercial solar sales tool, to model the economics of a hypothetical 200 kW PV installation on the roof of a 'big-box' retail store in the Raleigh area in order to determine a REC price necessary to deliver an internal rate of return (IRR) between 9% and 12%. Direct communication with a representative customer in Raleigh provided the energy usage and demand data, and the model incorporates actual utility tariffs (in this case, Duke OPT-G) and predicted system performance by location based on the National Renewable Energy Laboratory's PV Watts/TMY2 data. More information on the model can be found at http://www.ongrid.net/PVPayback.html.

Vote Solar used a 'big box' retail store because many commercial PV systems have been installed on the buildings of this type of retailer. Solar sales professionals have indicated that there is a general consensus that a PV installation must have above a 9% internal rate of return to make a solar project investment attractive. We ran the model under both a 3% and 6% background electricity escalation pricing scenario and for both 10 and 15 year contract

lengths. Using the target IRR, the model determined that a REC value of $0.17/kWh or higher would drive private investment in PV systems.

Q: Can you explain Exhibit 3?

A: Yes. Using the results from our analysis, we took a conservative estimate of the REC value necessary to drive customer investment in solar power projects, and used a value of $0.18/kWh over a 15 year contract term. At that rate, an equivalent investment to what Duke is proposing ($100 million) could be leveraged to incentivize 29.3 MW of customer-sited, customer-owned solar power installations, i.e. nearly 50% more capacity than Duke has indicated will be supported through its direct investment of $100 million in utility-owned solar generating capacity.

Q: What conclusion do you draw from these analyses?

A: For all the reasons cited in my testimony, I conclude that Duke ratepayers would be well-served if Duke were to expand its approach to compliance with the REPS to include a standard-offer REC purchase program.

Q: Does Duke provide a breakdown of PV generation costs?

A: No, Duke provides no indication of the cost of electricity and/or solar RECs per kWh of solar power generation that which would result from implementation of its Proposal. The only indication of comparative cost that Duke provides is anticipated cost per Watt of installed generating capacity. Duke's Owen Smith testifies that "between 80-90% of the program's installed capacity [20 MW DC] will consist.... [of] individual facilities in this category ranging from 500 kW to 3 MW." The cost projections are given as only $5 per Watt installed for systems

over 1 MW and $6.50 per Watt for 250 kW to 500 kW. The projected costs are not broken down into further details regarding component, labor, or administrative costs.

Q: Can you cite examples of other utilities that offer a standard REC offer to customers?

A: Yes, there are several illustrative examples, as follows:

- Arizona Public Service offers 10 and 15 year contracts with REC prices at 0.202/kWh and 0.187/kWh respectively. Small systems are offered an up-front payment of $3/watt DC, in exchange for the estimated REC production from the system.
- Public Service Company of New Mexico offers 20-year contracts for solar RECs at $0.13/kWh for systems under <10kW. It recently proposed expanding that program to commercial-scale systems between 10 kW and 1,000 kW.
- Xcel Energy in Colorado offers 20-year REC contracts with both an upfront buydown of $2/Watt for all systems up to 100 kW, plus an additional buydown of $2.50/Watt for systems under 10 kW or an additional $0.115/kWh produced for systems between 10 kW and 100 kW.

The varying pricing of REC offers reflects the cumulative effect of other incentives specific to each state (i.e. various preferential tax treatment), and the retail value of electricity within each utility service territory.

Q: Does this conclude your testimony?

A: Yes, it does.

STARRS EXHIBIT 1

Thomas J. Starrs

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EDUCATION

Energy & Resources Group, University of California, Berkeley
Ph.D., 1996

School of Law (Boalt Hall), University of California, Berkeley
J.D., 1988

Energy & Resources Group, University of California, Berkeley
M.A., 1987

University of California, Santa Barbara
B.A. with Highest Honors, Economics and Environmental Studies, 1983

EXPERIENCE

Iberdrola Renewables (formerly PPM Energy, Inc.)
Portland, Oregon
Managing Director, Solar Power, May 2007-July 2008

Bonneville Environmental Foundation
Portland, Oregon
Chief Executive Officer, April 2007 – May 2007
Chief Operating Officer, July 2005 – March 2007
Vice President, Marketing and Sales, January 2004 – March 2007

RWE Schott Solar Inc. (now Schott Solar Inc.)
Sacramento, California
Executive Vice President, May 2003 – November 2003

Schott Applied Power Corp.
Sacramento, California
President, March 2002 – May 2003

Kelso Starrs & Associates LLC
Vashon Island, Washington
Founding partner, renewable energy consulting firm, 1995 - 2002

Perkins Coie
Seattle, Washington and Washington, D.C.
Attorney, 1988 - 91

OTHER

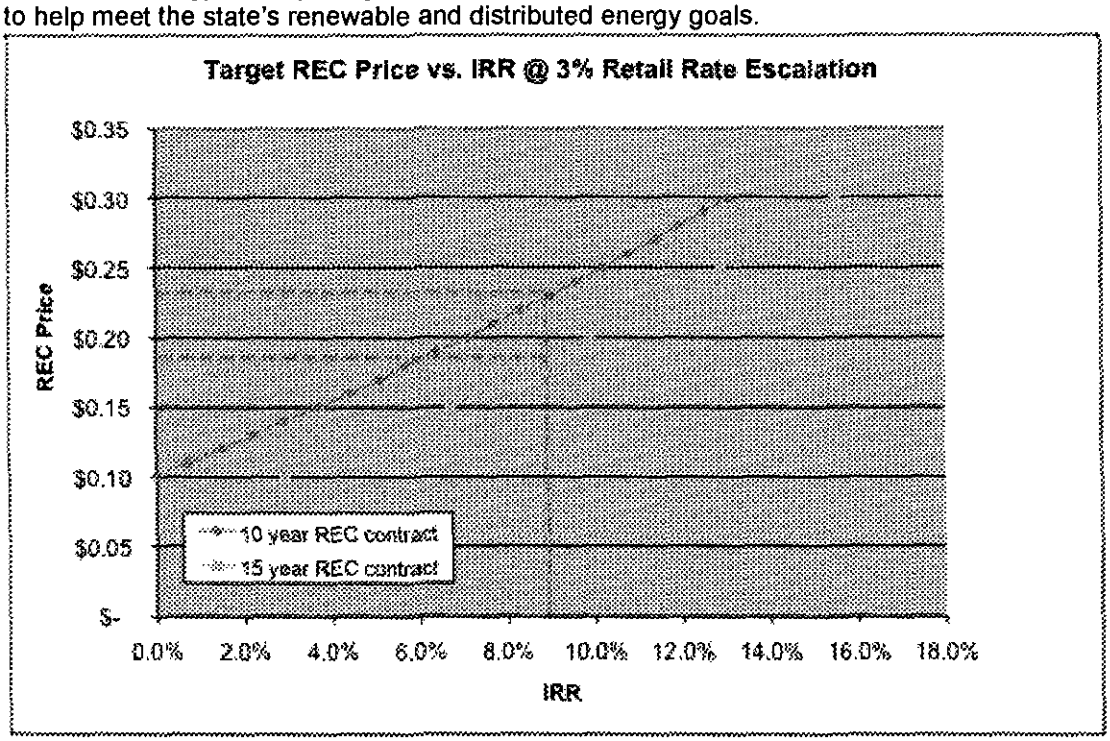
Admitted to the Bar of the State of Washington, 1989-Current
Board of Directors, The Prometheus Institute, 2005-Current
Board of Directors, Fat Spaniel Technologies, 2005-Current
Advisory Board, V2Green, 2007-Current
Advisory Board, Vote Solar, 2005-Current
Board of Directors, Center for Energy Efficiency and Renewable Technologies, 2002-Current
Board of Directors, Solar Energy Industries Association, 2007 – 2008
Board of Directors, Solar Alliance, 2007 – 2008
Board of Directors, American Solar Energy Society, 2000-2007
Recipient of numerous honors, awards, fellowships & prizes

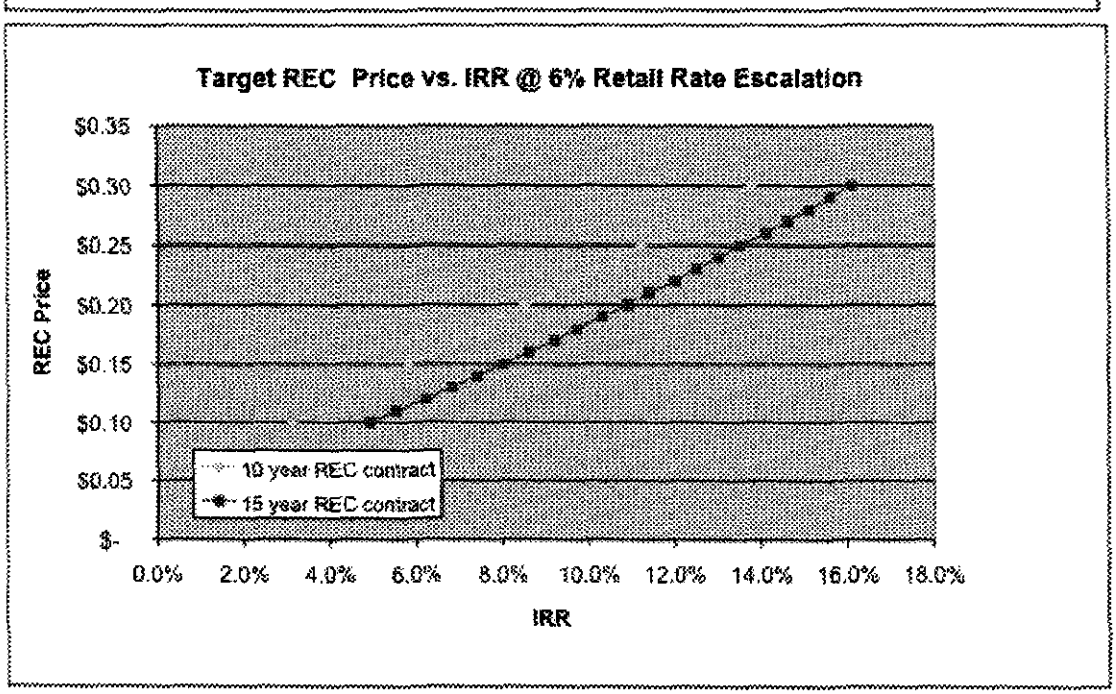
STARRS EXHIBIT 2

Analysis of the Internal Rate of Return at Various REC Prices for a Representative Customer in Raleigh, NC with a 200 kW PV System

The purpose of this analysis was to determine the level of renewable energy credit pricing which was necessary for a commercial solar project in North Carolina to achieve between a 9-12% rate of return.

Under current regulations and business climate, a commercial solar project in North Carolina rarely makes a compelling case for adopting solar generation. This analysis looks at what level of renewable energy credit pricing along with REC contract length will allow the photovoltaic market to help meet the state's renewable and distributed energy goals.



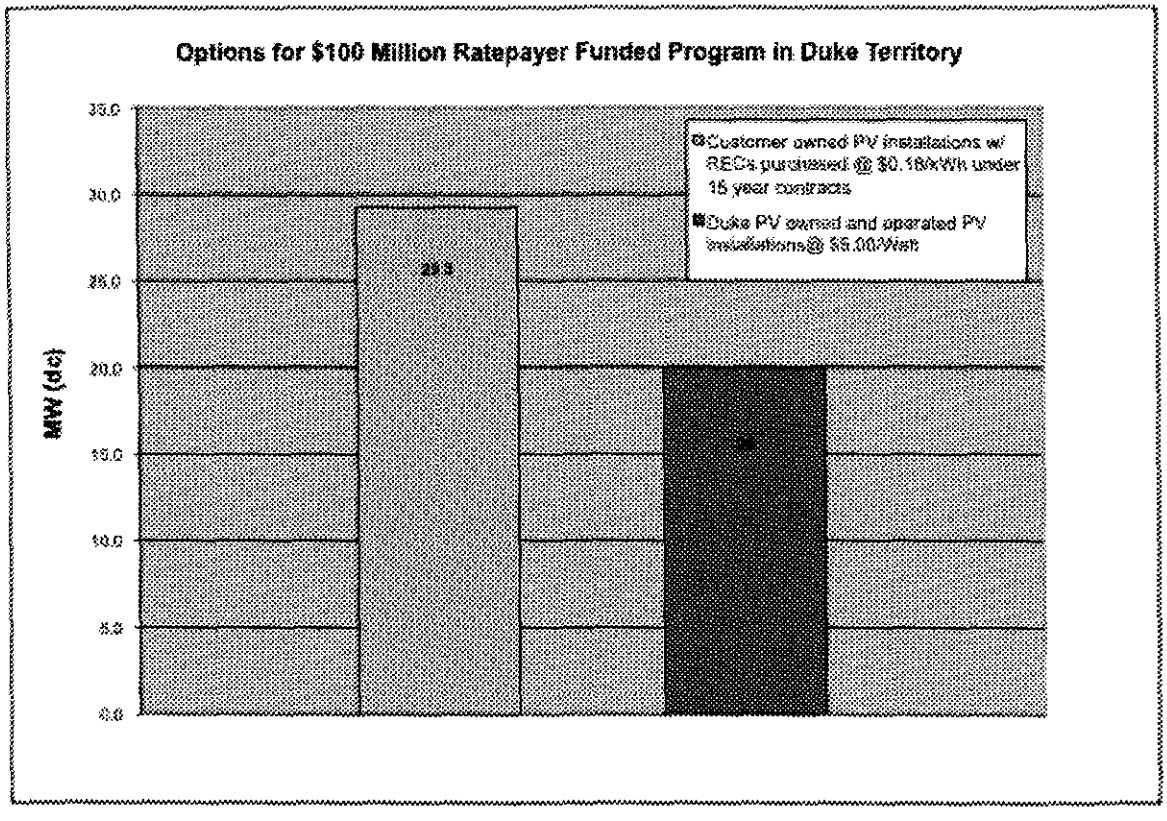


STARRS EXHIBIT 2 (CONTINUED)

Assumptions:			
System Parameters:			
Sample Box Store Customer:			
Location:	Raleigh		
Average monthly usage	235600 kWh		
Average demand	615kW/460kW summer/winter		
PV Cost ($/Watt)			
Commercial	$6.50 standard test conditions		
System Size	200	kilowatts	
Total system cost	$ 1,300,624		
PV Cost Reduction	2%	per year	
PV Production	1,191	kWh/kW STC	
System Degradation	0.5%	per year	
System Tilt	15 degrees		
Inverter Replacement	15	years	
Inverter Cost	$ 270	per kW	
Maintenance Cost	0.25%	of system cost/year	
Solar Incentives:			
Tax Credits			
	Credit	Cap	
Federal ITC			
Residential	30%	$ 2,000	
Commercial	30%		
State ITC			
Residential	35%	$ 10,500	
Commercial	35%	$ 2,500,000	
Utility Power Parameters:			
Utility Rates ($/kWh)			
Commercial	$ 0.072	Time of Use Rates - Duke OPT-G	
Utility Rate Escalation	Variable 3 or 6%	per year	
Utility Cost of Capital	7.5%		
Economic Parameters:			
General Inflation	3.0%	per year	
Target IRR / Discount Rate			
Commercial	9%-12%		
Tax Rates			
Federal			
Residential	28%	per year	
Commercial	35%		
State:			
Residential	7.5%		
Commercial	6.9%		
MACRS Depreciation			
Year	1	2	
Commercial	20.0%	32.0%	

STARRS EXHIBIT 3

Comparison of Amount of Solar Energy $100 Million Buys: Customer vs. Utility-Owned PV Generation



CERTIFICATE OF SERVICE

I hereby certify that this 10th Day of October, 2008, the following persons on the docket service list for Docket No. E-7, Sub. 856 have been served true and accurate copies of the foregoing Testimony of The Vote Solar Initiative by e-mail:

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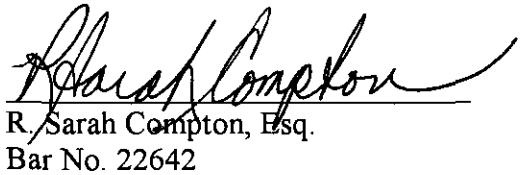

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