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IN THE MATTER OF THE APPLICATION OF SULPHUR SPRINGS VALLEY ELECTRIC COOPERATIVE, INC., FOR A HEARING TO DETERMINE THE FAIR VALUE OF ITS PROPERTY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RETURN THEREON, TO APPROVE RATES DESIGNED TO DEVELOP SUCH RETURN AND FOR RELATED APPROVALS.	**Docket No. E-01575A-08-0328**
IN THE MATTER OF THE APPLICATION OF SULPHUR SPRINGS VALLEY ELECTRIC COOPERATIVE, INC., FOR AN ORDER INSTITUTING A MORATORIUM ON THE NEW CONNECTIONS TO THE V-7 FEEDER LINE SERVING THE AREAS OF WHETSTONE, RAIN VALLEY, ELGIN, CANELO, SONOITA, AND PATAGONIA, ARIZONA.	**Docket No. E-01575A-09-0453**

WAYNE PORTER DIRECT TESTIMONY

IN SUPPORT OF INTERVENOR JAMES F. ROWLEY III

16 MARCH 2010

This filing contains my Direct Testimony in support of Intervenor James F. Rowley III who requested that I be a witness in these hearings.

I was asked by Mr. Rowley to prepare an analysis of the impacts to the monthly electricity bills of Sulphur Springs Valley Electric Cooperative members based on the net present values of five technically feasible options for the Sonoita Reliability Project as described in the Independent Feasibility Study of Electric Supply Alternatives submitted on December 31, 2009.

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Respectfully submitted on this 16th day of March 2010.

WAYNE PORTER

By _____

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DIRECT TESTIMONY

OF

Wayne Porter

AS A

WITNESS

FOR

James F. Rowley III,

INTERVENOR

16 MARCH 2010

IN THE MATTERS

OF

THE APPLICATION[S] OF SULPHUR SPRINGS VALLEY ELECTRIC COOPERATIVE, INC.,

FOR A HEARING TO DETERMINE THE FAIR VALUE OF ITS PROPERTY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RETURN THEREON, TO APPROVE RATES DESIGNED TO DEVELOP SUCH RETURN AND FOR RELATED APPROVALS.

AND

FOR AN ORDER INSTITUTING A MORATORIUM ON THE NEW CONNECTIONS TO THE V-7 FEEDER LINE SERVING THE AREAS OF WHETSTONE, RAIN VALLEY, ELGIN, CANELO, SONOITA, AND PATAGONIA, ARIZONA.

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DIRECT TESTIMONY
OF Wayne Porter

1. Introduction.

Q. Please state your name, business address, and occupation.

A. My name is Wayne Eliot Porter. I am the TogetherGreen Apacheria Fellow at the Audubon Society's Appleton-Whittell Research Ranch, HC 1 Box 44, Elgin, AZ 85611. I hold a Bachelor's Degree in Mathematics from Arizona State University, Tempe, AZ and I expect to complete my Master's Degree in Sustainability from ASU this summer. In an earlier career, I earned the Certified Financial Planner designation, which is presently inactive. I started studying energy systems, both formally and informally in the early 1990s and the focus within my studies at the School of Sustainability has been to understand the economic, social and environmental impacts of various energy technologies.

2. Involvement in these Proceedings.

Q. Why are you involved in these proceedings?

A. I was awarded an Apacheria Fellowship from the National Audubon Society for my project, "A Proposal for the Design and Development of a Plan to Reduce Carbon Emissions in Rural Southeastern Arizona." As part of my research, which includes an analysis of the efforts made by members of this community to reduce their carbon emissions and includes an educational outreach program, I became aware of the Independent Feasibility Study (IFS) of Electric Supply Alternatives prepared by Navigant Consulting, Inc. for SSVEC. Specifically, I thought it was important to show the impact to the average SSVEC member's monthly electricity bill that would be caused by each of the five technically feasible options that were described in the IFS if those costs were to be passed on directly to co-op members. For comparative purposes and in support of the Arizona Environmental Portfolio Standard, I also included financial analyses of a 3 MW photovoltaic (PV) system and a 2 MW sodium sulfur (NaS) battery-based energy storage system, each of which was described but deemed to be either technically or logistically infeasible by the authors of the IFS and thus not included in their economic analysis.

3. Prior Experience before the Corporation Commission.

Q. Have you previously testified before this Commission?

A. No.

4. Preparation of this Testimony.

Q. Have you received advice or help from others in preparing your Testimony?

A. No.

5. The Primary Reference for this Testimony

Q. What is the primary reference used for this Testimony?

A. The Independent Feasibility Study of Electric Supply Alternatives prepared for SSVEC by Navigant Consulting, Inc. and submitted to the Commission by SSVEC on December 31, 2009.

6. This Witness Testimony.

Q. Why are you a witness in these proceedings?

A. I prepared the financial analysis that includes the table shown below as Exhibit 1, Ratepayer financial analysis for five technically feasible options as stated in the IFS plus PV and energy storage options.

Q. What assumptions did you use to perform the financial analysis?

A. I calculated the monthly payment amounts needed to amortize the net present values of the five options shown in Table 12 (page 63) of the IFS over a 20-year period at an annual interest rate of 6%. Then I calculated simple averages using 51,849 electric services as specified in the 2008 SSVEC Annual Report to estimate the impact to the average monthly SSVEC electric bill. The cost of the 3 MW PV system owned by SSVEC was estimated based on a price of $5.40/W for a single-axis tracking system reduced by 30% for a federal renewable energy grant. An alternative to SSVEC owning a PV system is for a customer to build a system under a power purchase agreement with SSVEC to sell electricity to the co-op at a price 2 cents/kWh above the prevailing wholesale price of electricity and this customer-owned PV option was also included in the analysis. The monthly cost of the 2 MW NaS energy storage system was based on a price of $3,000/kW as stated in the IFS.

Q. What did you discover when you calculated the impacts to SSVEC ratepayers' bills of the various alternatives?

A. The five technically feasible options described by the IFS would cause increases to the average SSVEC bill ranging from lows of $0.23 and $0.33 for the demand-side management options and $0.79 for the distributed generation option to $1.77 and $2.27 for the two transmission options that include building a new substation in Sonoita and constructing 69kV lines through either the Babocomari Ranch or along SR82. A 3 MW SSVEC-owned PV system

would add $0.82 ($1.56 minus the $0.74 savings from avoiding the purchase of conventionally-generated electricity) to the average bill, and a 2 MW NaS storage system would add $0.83.

Q. Why did you think it was important to include the NaS battery system in your analysis?

A. I understand that the long lead times required to order, obtain and then install large NaS battery systems represent a challenge. But they would provide a number of benefits, and they are a proven technology that has been commercially manufactured in Japan since 2000, and portable diesel-powered generators could provide capacity for peak demand in the interim. Though NaS batteries contain a central core of liquid sodium, which is potentially explosive if exposed to water, the technology has been used safely in Japan since the mid-1990s and in a pilot project that started in the U.S. in 2001 and led to the installation of six MW of NaS units at American Electric Power facilities in Ohio and West Virginia. The high charge/discharge efficiency and long product lifecycle provide another set of benefits of the technology. A major advantage of implementing a NaS storage system in conjunction with the Sonoita Reliability Project is that the batteries could be charged by any of several different power sources. In the near future, they could be charged during low-demand periods using low-cost, conventionally produced SSVEC power. Then as more PV units are installed in the Elgin-Sonoita area, the solar arrays could provide the energy for the NaS units, which would provide both power for demand peaks and more stable voltage levels across the entire V-7 feeder circuit. While NaS systems do not present an immediate solution to the V-7 feeder's power quality issues, they could be a valuable and environmentally benign asset within a few years.

Q. Are there any potential economic benefits for SSVEC members if a 3 MW PV system were installed instead of the recently announced 750 kW system?

A. Yes, absolutely. A 3 MW array would generate about 6 GWh per year in Sonoita. The amount saved by SSVEC for avoiding the purchase of 6 GWh of conventionally-generated power is $462,000/year based on a current wholesale power price of 7.7 cents/kWh. Although 6 GWh represents less than 1% of the 819 GWh distributed by SSVEC in 2008, if the co-op owned a 3 MW PV array it would own the output for the 30+ year life of the array, and the annual savings would increase in direct proportion to the increases in the price of power sold to SSVEC by the Arizona Electric Power Cooperative and other suppliers.

Exhibit 1

Ratepayer financial analysis for five technically feasible options as stated in the IFS plus PV and NaS energy storage options.

IFS Option	Description	NPV (cost, in millions)[1]	Annual Cost(-) or Savings[2]	Additional Cost/Month on Average SSVEC bill[3]
T1	New 69kV line on Babocomari Ranch ROW and Sonoita Substation	$12.78		$1.77
T2	New 69kV line on SR 82 ROW and Sonoita Substation	$16.41		$2.27
DS2	Electric space heating with thermal storage	$2.06		$0.28
DS4	Space heating with fuel switching	$2.36		$0.33
R1-S	Solar photovoltaic (3 MW tracking array; SSVEC owns)[4]	$11.34	$462,000	$0.82
R1-C	Solar photovoltaic (3 MW tracking array; Customer owns)[5]	0	-$120,000	$0.19
R4	Energy storage (2 MW sodium sulfur battery system)[6]	$6.00		$0.83
R5	Distributed generation (2 MW diesel generator set)	$5.75		$0.79

[1]Net Present Values (costs to SSVEC) for T1, T2, DS2, DS4 and R5 are from the Independent Feasibility Study of Electric Supply Alternatives, p. 63.

[2]Annual cost or savings to SSVEC based on PV production of 6 GWh/yr and a 7.7 cents/kWh conventional wholesale power price.

[3]SSVEC cost amortized over 20 years at 6% annual interest and averaged across 51,849 electric services (SSVEC customers) in place.

[4]Price for 3 MW tracking array is $16.2 million ($5.40/W) based on a 3.3 MW single-axis tracking array recently constructed in Prescott, AZ. NPV is net cost after 30% federal renewable energy grant. The resulting $1.56 monthly cost per SSVEC member is then reduced by $0.74 per member monthly savings due to avoiding purchases of conventionally-generated power.

[5]Solar-generated tariff rate of 2 cents/kWh above the conventional wholesale power price. The tariff is then passed along to SSVEC customers.

[6]Cost for the storage system based on $3,000/kW as stated in the Independent Feasibility Study of Electric Supply Alternatives, p. 50.