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BEFORE THE ARIZONA CORPORATION COMMISSION

30-1

COMMISSIONERS

JEFF HATCH-MILLER, Chairman

WILLIAM A. MUNDELL

MIKE GLEASON

KRISTIN K. MAYES

BARRY WONG

Arizona Corporation Commission

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IN THE MATTER OF THE APPLICATION
 OF ARIZONA PUBLIC SERVICE COMPANY
 FOR A HEARING TO DETERMINE THE FAIR
 VALUE OF THE UTILITY PROPERTY OF THE
 COMPANY FOR RATEMAKING PURPOSES,
 TO FIX A JUST AND REASONABLE RATE OF
 RETURN THEREON, TO APPROVE RATE
 SCHEDULES DESIGNED TO DEVELOP SUCH
 RETURN, AND TO AMEND DECISION NO. 67744

E-01345A-05-0826

E-01345A-05-0827

DOCKET NO. E-01345A-05-0816

NOTICE OF FILING
TESTIMONY

The Solar Advocates hereby provide notice of filing the Surrebuttal Testimony of
 Mr. Robert Annan and Mr. Ed Smelloff.

RESPECTFULLY SUBMITTED this 27th day of September 2006.

THE SOLAR ADVOCATES

By:

Sean M. Seitz
 President
 Arizona Solar Energy Industries Association

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TESTIMONY OF SURREBUTTAL WITNESS ROBERT ANNAN
ON BEHALF OF THE SOLAR ADVOCATES
TO THE ARIZONA CORPORATION COMMISSION
Docket No. E-01345A-05-0816

Q. Please state your name and address.

A. My name is Robert "Bud" Annan. I live at 6605 Evening Glow Drive, Scottsdale, AZ.

Q. What is the purpose of your testimony?

A. I am a surrebuttal witness appearing to respond to the rebuttal testimony of Barbara Lockwood and Gregory A. DeLizio representing Arizona Public Service regarding the new issue raised in APS's rebuttal testimony proposing a new total solar schedule.

Q. What is your background as it relates to your testimony?

A. I have participated in the Commission's efforts to adopt a solar/renewable energy portfolio rule since 1996. Following adoption of the current 1.1% EPS Standard under Commissioner Mundell's leadership in 2001, I worked with APS, other utilities, and Advocates' to develop realistic programs that meet the requirements of the Commission's Order. With APS, I was a member of the Cost Evaluation Working Group that completed a Commission mandated study that led to the draft rules expanding the EPS to 15% by 2025. Most recently I worked with APS representatives and others in helping structure the Arizona Dept of Commerce Solar Road Map effort that uses ACC policy as the foundation for developing a strong, focused, statewide solar energy program. My resume is attached as Exhibit 1 to my testimony.

Q. According to Ms Lockwood's and Mr. DeLizio testimony, APS plans to offer its customers the opportunity to support solar energy by purchasing ASP-generated solar energy at a proposed rate of \$0.39 per kilowatt hour. What is your assessment of this proposal?

A. There are many other less expensive alternatives APS customers can already choose to support solar energy including the existing APS buydown program under the ACC EPS. It is unlikely that APS will have many customers sign up for a program that has a cost that is unreasonably high. Moreover, the proposal is a complete surprise and until this rebuttal testimony, APS has never expressed the need for a separate utility-scale project program such as they are proposing.

Q. What is your basis for stating that the \$0.39 per kilowatt hour is unreasonable?

A. There are three specific credible sources of current costs for large-scale utility solar energy projects that relate directly to Arizona: One is information from solar energy developers quoting on long term power purchase agreement bid requests. The second is from current government estimates for solar energy systems installed in 2005. The third

is specific Arizona experience from the Tucson Electric Power large-scale utility at Springerville. All these sources demonstrate conclusively that a more reasonable rate for the new APS program would be in the \$0.16-\$0.25 per kilowatt hour - significantly below the proposed APS \$0.39 kilowatt hour rate.

Q. Why is the APS rate so high?

A. Ms. Lockwood's testimony states that the \$0.39 kilowatt hour price is based on a single-axis photovoltaic system with an installed cost of \$7,000 per kilowatt, an average production of 2,400 kilowatt hours per kilowatt, a 25 year systems life and APS' "requested cost of capital". Although the system life and production output are consistent with industry experience, the \$7,000 per kilowatt installed cost exceeds the \$5,500 cost per kilowatt incurred in the construction of APS' solar plant at Prescott using the same technology. APS's requested cost of capital indicates the company is using conventional, financing together with traditional equity and debt rates of recovery as if the funds were borrowed from large East coast investment bankers. These financing mechanisms will more than double the cost of energy for a solar project that has no future fuel cost. These financing mechanisms have traditionally been used by utilities for projects that have a 25 year liability for future fuel costs. However, if the new APS solar program is approved in a tariff, these funds would be collected from customer bills at virtually no risk to APS. The financing choice ends up making the cost of solar look extremely high because of the arbitrary cost of capital and lack of more appropriate financial structuring, while benefiting APS shareholders when APS ratepayers are making the investment.

It is also unclear from the testimony of the APS witnesses whether APS intends to utilize the federal Investment tax credit available for solar energy projects. This tax credit by operation of law is not available to electric utilities. Were APS to find a private third party owner for the solar energy system, the tax credit of 30% would significantly reduce the costs of the system. By neglecting that credit, APS is pursuing a plant that raises a serious question on both the prudence and legitimacy of this solar proposal.

Thus, we believe that the proposed rate is likely to be extremely misleading to the citizens of Arizona, and that it does not sufficiently reflect more creative approaches to financing the projects that would fully benefit the citizens of Arizona in taking advantage of such current opportunities as the 30% federal tax credit not available to APS, but fully available to other investors who could pass on much of that benefit to Arizona's ratepayers.

Further, we urge the Commission to review very carefully the details of how APS has performed its cost of service studies as applied to distribution investment, and to the central station solar implementation. We believe that the "legacy" methods used to allocate distribution costs to customers, based on the "actual non-coincident peak load" of individual customers or customer classes are inherently discriminatory against customers who invest their own funds in distributed generation resources, thus enabling them to reduce their co-incident peak loads which can and should be recognized both in

the initial cost allocations and in then allocating the revenue requirement amongst various customers. As pointed out in the testimony of the Executive Agencies expert witness, the obsolete cost allocation approach utilized by APS thus lays the foundation of necessarily inefficient and uneconomic rate making in Arizona—thus inhibiting the economic development that might otherwise be present.

Q. Do you believe that program will meet its goals?

A. The program appears to have no set goal for installed capacity. This fact alone should cause the ACC to reject the proposal. However, using the solar partner's program sign up of 4,400 customers as a base, I would estimate that fewer than 1,000 customers would switch to this more expensive program. At the average kilowatt-hour demand of 1,163 kilowatt hours per month and the \$0.33 net solar rate, it would appear that APS contemplates collecting \$13,800 each from 1,000 solar price customers or about \$14,000,000 over the life of the three year pilot. This is enough to build a 2 megawatt system at \$7 a watt. This is hardly an exemplary project. I conclude that without a goal, with an unjustifiable high price resulting in little or no customer sign up and no commendable project there is no rationale for the program.

Q, You indicated that there are alternative available to customers and APS that would be more successful in supporting solar energy. What are they?

A. There are several alternatives. Provided APS implements a net metering tariff to so accommodate, customers could take their \$13,800 contribution and install their own solar energy system to meet 50 or 100% of their annual energy requirements. Another alternative is that APS should first be required to issue a solicitation that would purchase solar electricity using power purchase agreements from independent power producers with the purchase agreements for 25 years between \$0.18 - \$0.25/kWh indexed to the consumer price index. Another alternative is that if APS is allowed to build their own plant they should be required to follow the successful Tucson Electric's model that utilizes federal tax credit, accelerated cost recovery depreciation schedules, and building incrementally by using an annual expense accounting approach since the funds are provided by ratepayers at no risk or cost of capital to APS. This model has been used by TEP as part of its EPS program to build 5MW of large-scale solar projects with a delivered price of \$0.10 kilowatt hour.

Q. Does this complete your testimony?

A. It does.

Robert H. Annan

Qualifications

Robert "Bud" Annan has thirty five years experience in energy research and development. From 1964 to 1975 he was a staff member for Vice Admiral H. G. Rickover at the Atomic Energy Commission. That office was responsible for developing nuclear propulsion for Navy ships. From 1975 to 1996, Mr. Annan held various positions at the U. S Department of Energy responsible for renewable energy development. From 1982-1995 he was the Director of Solar Energy Research and Development. As director he was responsible for photovoltaics, solar thermal, and biomass power technologies. In addition to directing technology research and development he designed partnerships to accelerate the commercialization of new technologies. From 1994 to 1996, he was special assistant to the Sectary of Energy responsible for all renewable energy matters. In this position he led energy trade missions to India, China, Latin America and South Africa. He retired from government service in 1996. Mr. Annan is currently consulting with high-tech-industries, Arizona State University, and national research institutions on renewable energy matters.

In 1998, Mr. Annan organized and led the 45 member Arizona Clean Energy Industries Alliance to promote the use of solar resources in Arizona electricity restructuring rules. This organization was instrumental in Arizona adopting the first solar energy regulatory policy in the nation. He was a member of the Arizona Corporation Commission's Cost Evaluation Working Group. Its report to the Commission formed the basis for expanding Arizona's Environmental Portfolio Standard. He is a member of the Governor's Solar Energy Advisory Council and has participated in a number of special study working groups investigating the role of solar energy in Arizona's energy mix.

In November 2004 he was awarded National Renewable Energy Laboratory's highest honor, the Paul Rappaport award for "conceiving and directing research programs that have produced major improvements in solar energy technologies and for encouraging public polices that are moving those technologies into the mainstream of American life".

SURREBUTTAL TESTIMONY OF ED SMELOFF
ON BEHALF OF THE SOLAR ADVOCATES
TO THE ARIZONA CORPORATION COMMISSION
Docket No. E-01345A-05-0816

Q. Please state your name and business address.

A. My name is Ed Smeloff. My business address is 5901 Bolsa Avenue, Huntington Beach, CA 92647.

Q. Did you file direct testimony in this docket?

A. Yes.

Q. Please summarize your surrebuttal testimony.

A. My surrebuttal testimony will address APS's proposed net metering program. Specifically, the size of systems allowed to be net metered, caps on total participation, the type of meters that should be used, errors in the proposed allocation of costs and benefits of net metered systems, and APS's proposal to use EPS surcharge funds as compensation for alleged lost revenues.

Q. Have you read the Direct Testimony of Barbara Keene?

A. Yes.

Q. Can you discuss her definition of net metering?

A. Ms. Keene defines net metering as a system by which "customers receive retail prices for the electricity they generate."¹ This is incorrect. Net metering is more accurately described as an exchange of a kWh fed into the grid at one point in time for a kWh drawn from the grid at another point in time. At no point in time is a net metered customer/generator actually receiving payment at a retail price for generation. Under classic net metering, there is no buy/sell transaction. The Federal Energy Regulatory Commission has very clearly ruled to this effect. From FERC's decision in *MidAmerican v. Iowa Utility Board*, I quote: "In the case before us we find likewise that no sale occurs when an individual homeowner or farmer (or similar entity such as a business) installs generation and accounts for its dealings with the utility through the practice of netting."

Q. Can you comment upon Ms. Keene's testimony regarding APS's recovery of alleged 'revenue loss' through EPS funds?

A. I believe Ms. Keene's embrace of the concept that APS should be compensated for alleged revenue loss associated with net metering through the EPS is misguided for several reasons. First, it is based on a misinterpretation of net metering. Ms. Keene

¹ Barbara Keene testimony of August 18, 2006, page 4.

likens net metering to a power purchasing arrangement, testifying, "This situation is analogous to when APS contracts to buy renewable energy in the wholesale market." Ms. Keene's analogy is incorrect on several grounds. In terms of impact on utility operations and other ratepayers, net metering is actually much more analogous to energy conservation. Net metering adds no additional burden to a utility or other ratepayers (indeed, it can provide direct economic benefits), but effectively reduces the net amount of utility-provided energy required by the customer. The revenue impacts are exactly the same as investments in energy conservation.

Additionally, from a public policy point of view, an electrical system incorporating significant net-metered customer site generation has the following additional benefits not provided under the traditional central station/wholesale bulk purchase model:

1. Increased energy security based on the multiple sourced generation which is much more resilient to natural and man-made catastrophes.
2. Increased reliability based on reducing loading on the transmission and distribution system, where most outages originate.
3. The intangible but very real benefit of heightening the awareness and commitment to our nation's energy challenge in the coming decades by engaging customers directly in the solution while at the same time reducing fuel price fluctuation risk through diversity
4. The economic development benefits to the state, ranging from the creation of many additional jobs in the solar industry as homeowners and businesses install and maintain their systems, to the benefits of beginning to develop Arizona's unique solar resource—a national asset of significant and largely unrecognized national economic, environmental, and security importance.

Q. What would happen if the logic behind the premise of awarding compensation for lost revenues were applied evenly?

A. The logical extension of this argument would result in a situation where customers would pay the utility for lost revenue or lost contribution to fixed costs when they installed a more energy efficient refrigerator or permanently unplugged an extra refrigerator in the garage.

Q. Do any other states provide for the compensation of a utility's alleged loss of revenue due to net metering with funds dedicated to the support of renewable energy?

A. To the best of my knowledge, no. A survey of the 40 states that provide net metering does not reveal a single instance of compensation as described. The proposed arrangement is truly without precedent. Further, at a time when Arizona is facing extraordinary need for additional power, with APS seeking permission to invest in hundreds of millions of dollars in generation, transmission, and distribution system, it is especially illogical to focus on alleged "lost revenues."

Electric utilities do not have an inherent right to all possible "future revenue" and we recommend that the Commission explicitly state that fact in the course of this proceeding. While I agree APS is entitled to a fair chance to recover its investment and earn a reasonable rate of return thereon, at a time of unprecedented growth, we believe that the focus should be on the traditional rate making concepts of accurate determining of rate base on an expedited basis, and the allowed rate of return. With such an approach, "lost revenues" becomes irrelevant. "Lost Revenues" as a rate-making concept is only appropriate in a much more static regulated environment no longer present in Arizona. Moreover, a policy directing solar energy users (or the EPS funds) to provide compensation to APS for lost revenues when similarly situated customers who cause lost revenues do not have to provide equivalent compensation is contrary to the policy goals of promoting distributed renewable energy use.

Q. Can you summarize the Staff testimony regarding the size of systems eligible for net metering?

A. Staff witness Barbara Keene recommends 100 kW. Ms. Keene's argument is that a 100 kW size limitation "would allow larger projects to participate, while continuing to not allow a few projects to consume all the funds."² I believe she uses the unrealistically low proposed cap on the program to justify adding yet another limitation on the development of Arizona's indigenous and uniquely abundant solar energy resources and that this does not comport with the policy goals of promoting distributed renewable energy generation.

Q. Do you agree with Staff's arguments and recommendations on size limitations for net metered systems?

A. No. Ms. Keene's support for a 100 kW cap is based upon her belief that net metering causes compensable loss of revenues to APS, and she proposes the cap as a way to limit the State of Arizona's development of its renewable energy resources. As discussed earlier in my testimony, net metering brings benefits, and I believe that it should be the policy of the Commission to support policies that increase, not limit, the amount of renewable energy in Arizona, as a matter of good business, economic development, enhanced energy security of the nation, and environmental protection. I have not seen and do not believe Staff has undertaken any credible study to identify the proper economic valuation of the power provided by solar energy both in terms of the time of day when solar energy is produced and the value at the point where power is delivered to the grid.

Q. Can you comment on the APS rebuttal testimony regarding the size of systems eligible for net metering?

A. APS witness Gregory A. DeLizio recommends 10 kW as the size limit for the proposed net metering tariff. Mr. DeLizio points out that APS offers net billing (a system by which a customer sending electricity back into the grid is paid for that generation at APS's avoided generation rate) to customers up to 100 kW in size under Schedule EPR-

² Barbara Keene testimony of August 18, 2006, page 7.

2, and for systems up to 10 kW in size under Schedule EPR-4. However, net billing is categorically different from net metering, and the argument is not relevant, and is disingenuous. It directly contradicts the provisions of the Energy Policy Act of 2005 which specifically provides, in new PURPA Net Metering Standard (16 U.S.C. 2621(d)(11)):

(11) Net Metering. Each electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves. For purposes of this paragraph, 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 emphasized phrase now in federal law, “may be used to offset” highlights the exchange aspect of net-metering, and the inherent lack of an immediate sale often advocated by “anti-solar energy” net metering opponents.

Mr. DeLizio also points out that 33 other states have net metering programs with caps on generator size at or below 100 kW. It is unclear why this is an argument for, rather than against, a 10 kW APS limit. The simple fact of the matter is that the economic impact on a utility and other ratepayers (both positively and negatively) are dictated by the total capacity interconnected, not the size of any one system. Larger systems are often cheaper as APS itself has argued previously, and prudent policymaking would suggest that any caps be set at a level that allows for the most cost-effective installations. Colorado, a distant competitor to Arizona in terms of its solar energy resource, has chosen 2 MW, and we believe that is the minimum support the development of Arizona’s unique solar resource should receive. An artificially low cap on individual project size would drive up the overall cost of a distributed renewable energy program in Arizona and would needlessly make it more difficult to meet the targets established for distributed renewable generation.

Q. Can you comment on the issue of meters?

A. I support APS witness Mr. DeLizio’s recommendation that a single bi-directional meter is a better option.

Q. Does this complete your testimony?

A. It does.