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BEFORE THE ARIZONA CORPORATION COMMISSION

JEFF HATCH-MILLER, CHAIRMAN
WILLIAM A. MUNDELL
MIKE GLEASON
KRISTIN K. MAYES
BARRY WONG

E-01345A-05-0826
E-01345A-05-0827

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	Docket No. E-01345A-05-0816 **NOTICE OF FILING TESTIMONY**

Arizona Corporation Commission
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Western Resource Advocates, through its undersigned counsel, hereby provides notice that it has this day filed the written surrebuttal testimony of David Berry in connection with the above-captioned matter.

DATED this 27th day of September, 2006.

ARIZONA CENTER FOR LAW IN
THE PUBLIC INTEREST

By _____
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ORIGINAL and 13 COPIES of
the foregoing filed this 27th day
of September, 2006, with:

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Phoenix, AZ 85007

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this 27 day of September, 2006, to:

All Parties of Record

_____

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

JEFF HATCH-MILLER, Chairman
WILLIAM A. MUNDELL
MIKE GLEASON
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Surrebuttal Testimony of

David Berry

Western Resource Advocates

September 27, 2006

aps 2005-2006 db surrebuttal.doc

Surrebuttal Testimony of David Berry
Docket No. E-01345A-05-0816

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Introduction

Q. Please state your name and business address.

A. My name is David Berry. My business address is P.O. Box 1064, Scottsdale, Arizona 85252-1064.

Q. Did you file direct testimony in this Docket?

A. Yes, on behalf of Western Resource Advocates (WRA).

Q. What is the purpose of your surrebuttal testimony?

A. My surrebuttal testimony addresses issues raised by Arizona Public Service Company (APS) in its rebuttal testimony filed September 15, 2006. In particular, I address:

- Demand side management to reduce the urban heat island effect (rebuttal testimony of Teresa Orlick);
- Green power (rebuttal testimony of Greg DeLizio and Barbara Lockwood);
- The role of renewable energy in APS' portfolio (rebuttal testimony of Barbara Lockwood and Patrick Dinkel);
- Environmental issues, namely the Environmental Improvement Charge (EIC) and the greenhouse gas studies recommended by WRA (rebuttal testimony of Ed Fox).

Demand Side Management to Reduce the Urban Heat Island Effect

Q. Did WRA recommend a demand side management (DSM) program to reduce the urban heat island effect?

A. Yes.

Q. What is APS' response to this proposal?

A. Ms. Orlick (pp. 12 to 14) indicated that APS would schedule a DSM Collaborative meeting that would include a presentation about Arizona State University's research on mitigating the heat island effect, that an urban heat island effect program could be incorporated into the existing non-residential DSM programs as a custom efficiency component, and that Staff had found that the (retrofit) cool roofs component of an urban heat island reduction program was not cost effective (Decision No. 68488, Staff

Interim Report, January 18, 2006, p. 33). Ms. Orlick also stated (p. 14) that APS believes that the research underway at Arizona State University's Global Institute of Sustainability should yield substantial results before proceeding down the path of developing an entire heat island effect DSM program.

Q. What is WRA's response to Ms. Orlick's rebuttal testimony?

A. WRA is pleased that APS is willing to consider a heat island reduction program and to bring in outside experts to inform the Collaborative. I believe that the program would benefit from the following features:

1. Inclusion of practitioners in urban planning and landscape architecture, a representative from the Center for Urban Forest Research at the US Forest Service's Pacific Southwest Research Station (if available), and a representative from the Heat Island Group at the Lawrence Berkeley National Laboratory (if available) in the Collaborative meetings on the urban heat island reduction program in addition to the researchers from Arizona State University proposed by Ms. Orlick.

2. Actively seeking out one or more specific neighborhoods in which to geographically concentrate a large number of urban heat island reduction measures so as to capture both direct and indirect savings from shade trees, cool roofs, and cool pavements and to achieve a high level of energy savings. In this respect the urban heat island reduction program would differ from typical DSM programs in which DSM measures are applied to customers scattered around APS' service territory. Further, implementation of the urban heat island reduction program would likely require cooperation of a municipality as street trees and pavement are program elements. APS and its experts may be actively involved in the selection of candidate neighborhoods and in the design of the customer efficiency measures so as to maximize the cost effectiveness of the program.

3. Expeditious implementation of the urban heat island reduction program. There has been over a decade of research on urban heat island reduction.[1] It is not necessary to delay several years for more research to be completed before designing a cost effective urban heat island reduction program.

Q. Does WRA have a position on whether the urban heat island reduction program is incorporated into existing approved DSM programs?

A. Ms. Orlick's proposal to include the urban heat island reduction program as a custom program within existing nonresidential programs is appropriate.

Q. What specific DSM measures would be included in an urban heat island reduction program?

A. Measures would typically include shade trees, cool roofs, and cool pavements, although the specific mix will have to be determined by the Collaborative and APS. As indicated in my direct testimony (pp. 16 –17, and Exhibit DB-6), energy savings can be obtained from shade trees, cool roofs, and indirect effects due to urban vegetation, reflective building surfaces, and cool pavements.

I am aware that Staff has concerns over the cost of cool roofs as explained in Decision 68488 (page 33 of Staff's January 18, 2006 report). Staff found that in retrofit applications, cool roofs were not cost effective on non-residential structures, and Staff found that for new roofs the marginal cost of reflective coatings was zero or negative, leading Staff to conclude that incentives in such applications were not needed. I would urge APS and the Collaborative to try to select candidate neighborhoods for the heat island reduction program so as to develop a cost effective

[1] Examples include: E. Gregory McPherson, "Evaluating the Cost Effectiveness of Shade Trees for Demand-Side Management," *The Electricity Journal*, vol. 6, no. 9 (November 1993), 57-65. James Simpson, "Urban Forest Impacts on Regional Cooling and Heating Energy Use: Sacramento County Case Study," *Journal of Arboriculture*, vol. 24, no. 4 (July 1998): 201-214. Brian Stone and Michael Rodgers, "Urban Form and Thermal Efficiency: How the Design of Cities Influences the Urban Heat Island Effect," *Journal of the American Planning Association*, vol. 67, no. 2 (Spring 2001): 186-198. E. Gregory McPherson, "Cooling Urban Heat Islands with Sustainable Landscapes," in Rutherford Platt, Rowan Rowntree, and Pamela Muick, eds., *The Ecological City*, Amherst, University of Massachusetts Press, 1994. H. Akbari and S. Konopacki, "Calculating Energy-Saving Potentials of Heat-Island Reduction Strategies," *Energy Policy* vol. 33 no. 6 (April 2005): 721-756. U.S. Environmental Protection Agency, *Cooling our Communities*, 1992. Anthony Brazel and Katherine Crewe, "Preliminary Test of a Surface Heat Island Model (SHIM) and Implications for a Desert Urban Environment, Phoenix, Arizona," *Journal of the Arizona-Nevada Academy of Science*, vol. 34, no. 2 (2002): 98-105. Kim Clark and David Berry, "House Characteristics and the Effectiveness of Energy Conservation Measures," *Journal of the American Planning Association*, vol. 61 (Summer 1995) 386-395.

program. Cool roofs should be part of the list of measures considered as the incremental cost may be zero for structures that would need new roofs anyway and because the energy savings at new and existing structures should account for indirect effects. Cost benefit analyses for candidate locations should also consider the age of existing structures as older buildings produce much larger savings from cool roofs than newer buildings.[2] The role of incentives for cool roofs and other program measures will have to be assessed by the Collaborative, taking into account Staff's previous findings.

Green Power

Q. What was WRA's position on APS' initial green power proposal?

A. WRA supported the concept but recommended refinements to APS' initial proposal (direct testimony, pp. 2-7).

Q. Has APS proposed changes to its initial green power tariff?

A. Yes. Mr. DeLizio and Ms. Lockwood propose several changes:

- The premium has been changed to $0.01 per kWh (Mr. DeLizio, p. 7), taking into account the costs of one geothermal project and two wind projects and taking into account APS' avoided costs as filed on June 30, 2006 (Ms. Lockwood pp. 5-6, Mr. DeLizio, pp. 7-8).
- The block size for the block option is increased from 25 kWh per month to 100 kWh per month (Mr. DeLizio, p. 7).
- As new renewable energy resources are used after the initial green power resources are fully subscribed, APS may file new green power rates reflecting the new resource costs and the most recent approved avoided cost filing (Mr. DeLizio, p. 8). Apparently the new green power rates would apply only to customers who had not subscribed under the initial green power tariff. The initial subscribers would continue to be served under schedules GPS-1A and GPS-2A (Mr. DeLizio, pp. 8-9).
- Green power kWh would be excluded from the Environmental Portfolio Standard charge and EIC charge, but all other kWh consumed by green power customers would be subject to these charges (Mr. DeLizio, p. 9).
- Green power kWh would be subject to the Power Supply Adjustment, the Transmission Cost Adjustment, the Competition Rules Compliance Charge, and the Demand Side Management Adjustment (Mr. DeLizio, p. 9).
- APS will provide reports on customer participation, kWh sales, and revenue in its annual EPS/RES filings (Ms. Lockwood, p. 6).

[2] H. Akbari and S. Konopacki, "Calculating Energy-Saving Potentials of Heat-Island Reduction Strategies," *Energy Policy* 33 (2005): 721-756.

- APS will pursue Green-e certification for its green power products (Ms. Lockwood, pp. 6-7).

Q. What is WRA's response to these proposed revisions to the green power service?

A. WRA appreciates APS' willingness to refine the green power option. We are also cognizant of the need for a practical, workable tariff that meets customers' needs. All of the changes proposed by APS are an advance over APS' original proposal. However, several additional improvements and clarifications are desirable:

1. WRA believes that the premium should reflect the stable cost of renewable energy minus the fluctuating cost of conventional generation. Thus, in periods of high fossil fuel prices, for example, green power might be less costly than conventional generation, resulting in an effective premium that is negative. This feature has been characterized as a "best practice" for green power programs.[3] Therefore, under APS' proposal contained in its rebuttal testimony, the green power tariffs should be further revised to allow for regular changes to the rates to reflect updates to APS' avoided costs.[4]
2. Instead of multiple green power tariffs as proposed by APS, it would be simpler for APS and its customers to have one set of green power tariffs whose rates are regularly reviewed and revised as avoided costs change and as the renewable energy mix changes.
3. APS should be using new renewable resources to serve green power customers and not simply re-sell, at a premium, renewable resources it has already committed to. The Green-e Renewable Electricity Certification Program, National Standard Version 1.3, Section III. D indicates that "Green-e certified products must be comprised of eligible renewable generation over and above anything required by state or federal RPS requirements. Renewable energy or RECs [renewable energy certificates] may NOT be used in a Green-e certified product under the following circumstances: The REC or the electricity from which the RECs are derived is being used simultaneously to meet a local, state or federal energy mandate or other legal requirement…." WRA believes that this is good public policy even if a utility does not seek Green-e certification. Thus, the kWh APS actually uses to serve green power customers should not also be used to

[3] Center for Resource Solutions, *Regulator's Handbook on Renewable Energy Programs and Tariffs*, March 2006, p. 11, www.resource-solutions.org.

[4] APS files avoided costs every two years in compliance with the Public Utility Regulatory Policies Act of 1978, Title II, Section 210. The most recent filing with the Director of the Utilities Division was on June 30, 2006. This filing could be used for avoided costs although other information may be suitable as well.

meet the RES requirements,[5] the commitments made under Decision No. 67744, or the requirements of any renewable energy program adopted in this Docket such as WRA's 1300 GWH per year proposal or the Interwest Energy Alliance proposal (direct testimony of Amanda Ormond, pp. 6-7).[6]

4. The Green-e program requires that percentage products for residential customers must offset at least 25 percent of a residential customer's electricity usage above and beyond any state mandated renewable portfolio standard.[7] As currently proposed, residential customers could obtain only 10 percent of their kWh from the green power program. This discrepancy needs to be addressed.

Q. What is WRA's recommendation regarding the revised green power tariff?

A. The Commission should accept APS' revised green power tariff with the following modifications:

1. The green power tariffs should indicate that APS may re-file rates annually to reflect changes in avoided costs or the mix of renewable resources[8] or both if any changes are needed. Thus, all green power customers would be served under a single set of block and percent rates.
2. Green power kWh should be in addition to kWh used to meet RES requirements, in addition to kWh used to meet APS' renewable energy commitments contained in Decision No. 67744, and in addition to the requirements of any renewable energy program adopted in this Docket such as WRA's 1300 GWH per year proposal or the Interwest Energy Alliance's proposal.
3. The green power percent schedule should be modified so as to apply the 10 percent option only to non-residential customers.

[5] APS has indicated that it would use the same resources to meet RES requirements and to serve green power customers, but that kWh used to serve green power customers would not be counted toward the RES requirements (response to data requests WRA 1-3 and 1-4). WRA believes that this policy is acceptable.

[6] The Green-e Renewable Electricity Certification Program, National Standard Version 1.3, Section III B, indicates that a Green-e certified product may include only renewable energy that was generated in the calendar year in which the product is sold, the first three months of the following calendar year, or the last six months of the prior calendar year.

[7] Green-e Renewable Electricity Certification Program, National Standard Version 1.3, Section III A.

[8] To be eligible for Green-e certification, a renewable energy resource must have been placed in operation (generating electricity) on or after January 1, 1997: Green-e Renewable Electricity Certification Program, National Standard Version 1.3, Section II E.

Renewable Energy

Q. What did WRA recommend regarding an increased role for renewable energy for APS?

A. WRA proposed that renewable energy be used as a hedge against high costs of natural gas used for generating electricity (pp. 7-15). I recommended, among other things, that the Commission direct APS to acquire 1,300 GWH per year of low cost, stably priced renewable energy under long term contracts starting within the period 2008 through 2010 and continuing for at least 15 years. This renewable energy is in addition to that obtained in compliance with Decision No. 67744. I also recommended (p. 12) that APS include in regular reports a detailed description of any problems encountered in acquiring renewable energy as a hedge against high fossil fuel prices and offer proposed solutions. The Commission would review APS' reports and set a course of action for APS to deal with any problems. WRA continues to recommend the steps described above.

Q. What is APS' perspective on the increased role of renewable energy in its portfolio?

A. Mr. Dinkel (rebuttal, p. 2) notes that renewable energy should make up a larger percentage of APS' generation portfolio. Ms. Lockwood (p. 9) indicates that APS supports the intent of the draft Renewable Energy Standard (RES) rules and believes that the RES rulemaking is the proper forum for addressing renewable energy.

Q. Is this rate case an appropriate forum for the Commission to consider the role of renewable energy in APS' portfolio?

A. Yes. Much of the cost increase that APS proposes to recover through rates is due to higher fuel costs. To the extent that APS caps its exposure to high fossil fuel costs through use of renewable energy, rate increases can be capped. Moreover, the RES rules, as proposed, do not create a sufficient hedge against high natural gas costs quickly enough (WRA direct testimony, p. 12).

Q. What issues did APS raise in response to WRA's recommendation?

A. WRA's direct testimony indicates that low cost, stably priced renewable energy can be a cost effective hedge in general. However, Mr. Dinkel (rebuttal, p. 2) is concerned that renewable energy may not be a cost effective hedge against high natural gas prices for APS because renewable energy might cost more than conventional generation in that particular case.

Q. How might APS lower the costs of renewable energy?

A. APS can take several steps to help lower the cost of renewable energy:

1. **Seek proposals not only from developer-owned projects, but also for projects that would be owned by APS**. There is some evidence that renewable energy project developers are pricing energy to approximately match the cost of generating electricity from gas-fired resources. If APS owned the facilities it may be able to lower the cost. Utility ownership of renewable energy resources is becoming more common.
2. **Get better information on wind integration costs**. These costs are likely to be smaller than the costs APS used in its evaluation of the 2005 renewable energy acquisition (direct testimony, pp. 14-15). APS' forthcoming wind integration study (Mr. Dinkel rebuttal, pp. 4-6) should address this need. Mr. Dinkel (rebuttal, p. 4) also raises the issue of the impact of intermittency of wind energy on the costs of scheduling gas purchases and this issue should be included in the wind integration study.[9]
3. **Assign only the incremental costs of transmission to renewable energy**. If APS obtains renewable energy from a geothermal resource, for example, it will need transmission service to deliver the energy to the APS system. However, it will also need less transmission service somewhere else because it does not have to transmit power from another (conventional) resource to its customers. The proper cost to assign to renewable energy is not the cost of transmission from the illustrative geothermal project, but the difference in transmission cost between that needed for the geothermal project and that transmission cost avoided by the geothermal project.

Q. Can the Commission or APS ever be sure that renewable energy will or will not be less costly than gas-fired generation in the future?

A. No. That is why low cost, stably priced renewable energy is best viewed as a <u>hedge</u> against high gas prices in an uncertain world. It is not possible to reliably forecast the price of natural gas. For example, the Energy Information Administration[10] has stated that "Natural gas generally has been the fuel with the least accurate forecasts." Table 1 of the EIA Forecast Evaluation report shows that the average absolute percent error for its *Annual Energy Outlook* forecasts of natural gas wellhead prices from 1982 to

[9] Public Service Company of Colorado investigated this gas cost impact and, for the case where wind penetration is 10 percent of peak load, found the cost to be between $1.26 per MWh of wind energy and $2.17 per MWh, depending on whether the additional benefits of gas storage are considered. EnerNex Corporation, *Wind Integration Study for Public Service Company of Colorado*, report to Xcel Energy, Knoxville, TN, 2006, pp. 22, 71-77.

[10] EIA, *Annual Energy Outlook Forecast Evaluations 2004*, p. 2.

2004 was 67.7%. The large error in gas price forecasts, especially in an era of high gas prices, underscores the hedge value of fixed or stably priced renewable energy resources relative to the uncertainty of natural gas prices. Moreover, with this kind of inaccuracy, neither utilities nor regulators can use price forecasts to effectively manage gas price risk. WRA's analysis in its direct testimony indicates that at recent natural gas prices, some renewable energy resources are less costly than conventional generation and that the renewable energy can be obtained at fixed or stable prices.

Environmental Issues

Q. Why is it important for the Commission to encourage electric utilities to reduce the environmental impacts of power generation?

A. Electric utilities have a major impact on the environment. For example, electric utilities account for the following shares of human-caused air emissions in the United States:[11]

- 33% of greenhouse gas emissions which are a cause of climate change
- 67% of sulfur dioxide emissions
- 22% of nitrogen oxides
- 43% of mercury emissions.

It is in the public interest to reduce emissions of each of these compounds and pollutants because of their environmental impacts which I described in my direct testimony (pp. 18-21). Initially, APS expects to reduce SO_2, NOx, PM10, and mercury emissions from the Cholla plant (Mr. Fox, rebuttal testimony, Attachment EZF-1RB).

Q. WRA supported APS' proposed Environmental Improvement Charge (direct testimony, pp. 17-20). Does WRA still support the EIC?

A. Yes. WRA believes that it is in the public interest to reduce the environmental impacts of power generation and for utilities, including APS, to be willing partners in reducing those environmental impacts. APS indicates that after-the-fact regulatory review for cost recovery has been a major obstacle to proactively addressing environmental issues and creates a disincentive to undertake anything more than the minimum environmental actions as late as possible (Mr. Fox, rebuttal, p. 10). Mr. Fox (p. 17) also states that regulated utilities should be provided with a process by

[11] Data from U.S. Environmental Protection Agency, *Air Pollutant Emission Trends, 1970-2002*, 2005, Table 361, U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004,* 2006, Table 2-14, U.S. Environmental Protection Agency, "Controlling Power Plant Emissions: Emissions Progress," www.epa.gov/mercury/control_emissions/emissions.htm.

which expenditures on emission reductions are deemed prudent and recoverable. APS is further concerned that its expenditures to address climate change have a risk of becoming stranded without the EIC or a similar process (Fox rebuttal, p. 17).

Because of the large environmental impact of conventional power generation, it would not be in the public interest to impede APS' practical and forward-looking efforts to reduce environmental impacts by making cost recovery uncertain or onerous.

Q. Several parties to this case have expressed concern that the EIC falls outside the scope of traditional ratemaking. Does this mean that the EIC should not be approved by the Commission?

A. No. In reaction to non-traditional aspects of furnishing electricity, the Commission has pursued innovative approaches to ratemaking. The EIC, if adopted, would fall into this category. Innovative actions considered by the Commission to pursue environmental or other objectives include a performance incentive for APS' DSM program (see direct testimony of Staff witness Anderson, pages 9-13) and the funding mechanism for the Environmental Portfolio Standard. As non-traditional issues affecting electric service emerge, it is appropriate for the Commission to develop creative means to both protect the interests of ratepayers and foster other goals such as environmental improvements.

Q. Is the EIC the only mechanism for APS to recover prudent expenditures on environmental improvements?

A. No. WRA proposed a greenhouse gas emission reduction planning process incorporating emission reduction commitments and cost recovery (direct testimony, pp. 24-26). WRA also proposed a process for demonstrating the prudence (or lack of prudence) for power supply choices made before the Commission approves APS' greenhouse gas emission reduction commitment and associated plan. WRA continues to recommend adoption of these processes regarding climate change, along with the EIC.

Q. Does this conclude your surrebuttal testimony?

A. Yes.