

ORIGINAL

Marshall Magruder  
PO Box 1267  
Tubac, Arizona 85646



0000004104

29 June 2004

Mr. Raymond T. Williamson  
EPS Workshop Chairman  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

RE-00000C-00-0377

AZ CORP COMMISSION  
DOCUMENT CONTROL

2004 JUN 30 P 12:05

RECEIVED

Re: Environmental Portfolio Standard Change Workshop 5, held 25 June 2004 at Phoenix, Arizona

As indicated in our discussions, enclosed is a write-up and expansion of the oral presentation given at Workshop 5. It should be considered as an addition or supplement to the 17 April proposal previously submitted after Workshop 3, which is slightly modified and included as Attachment 2.

Please free to call or request additional information as this topic or additional information about the recommendations, as this topic is critical for long-term reliable, efficient, cost-effective electricity.

Sincerely,

Marshall Magruder  
(520) 398-8587  
[marshall@magruder.org](mailto:marshall@magruder.org)

Arizona Corporation Commission

DOCKETED

JUN 30 2004

DOCKETED BY	<i>CM</i>
-------------	-----------

Attachments:

1. Marshall Magruder letter to the ACC "Recommendations for the New Energy Portfolio Standard, A New Funding Source" of 29 June 2004.
2. Answers to Questions and Recommendations from the 17 April 2004 letter.

**Marshall Magruder  
PO Box 1267  
Tubac, Arizona 85646  
June 29, 2004**

**BEFORE THE ARIZONA CORPORATION COMMISSION**

Chairman Marc Spitzer  
Commissioner William A. Mundell  
Commissioner Jeff Hatch-Miller  
Commissioner Mike Gleason  
Commissioner Kristin Mayes  
EPS Workshop Chairman Ray T. Williamson  
1200 West Washington Street, Phoenix, AZ 85700

Recommendations for the New Energy Portfolio Standard, A New Funding Source

Ref:(a) Environmental Portfolio Standard Change Workshop 5, "Notice of Special Open Meeting"  
(b) Marshall Magruder letter of 16 April 2004, Public Comments for Workshop 3 Agenda Issues

Summary. This letter provides a new funding recommendation for consideration as discussed during Workshop 5, reference (a). This is an additional or supplemental input to the letter of 16 April 2004 on this subject, reference (b).

**1. A New EPS Funding Mechanism.**

Arizona has a high growth rate, which is expected to continue for several decades. This requires an expanding energy infrastructure, mostly in the form of electricity and natural gas.

To solve this challenge, it is proposed we have both

- (1) The utility companies continue building large generation sources, including renewables, connected to distant load centers by transmission lines with energy losses and associated pollution concerns, and
- (2) The Customers build local, distributed, customer-owned systems connected to the utility company's grid to reduce the utility company's capital costs for generation and transmission, reduce Arizona's dependence on fossil fuels, improve air quality, and provide additional renewable, sustainable energy sources.

**This proposal adds an EPS Charge or tariff for new customers to cover the utility's infrastructure costs and additional funding for the Environmental Portfolio Standard (EPS) program by emphasizing both "customer-owned energy systems" and "high efficiency building structures."**

These new Arizona energy customers do not pay in advance for the infrastructure improvements. The existing customers paid these in their rates.

This letter proposes to reduce this inequity by adding incentives, when most economically beneficial, to support (1) customer-owned renewable energy and (2) high-efficiency facilities to lower energy demands.

Renewable energy is proposed to account for 15% of the total energy demand in 2021, the other 85% being provided by the utility companies. This will be about 2,500 MW (equivalent to about 8 power plants and \$2.5 billion dollars), about the allocation for Arizona from the 30,000 MW the past two Association of Western Governor's Conferences have stated as their goal by 2010. Further, the impacts of high-efficiency will be able to demonstrate and assist in funding high-efficiency structures in Arizona.

The term "customer-owned energy systems" will be defined to include all energy options permitted under the ACC's EPS program and specifically exclude using refined fossil fuels not available to the property owner. For example, any fuel oil that has to be transported to the customer's site would not qualify, however, fossil fuels generated on-site, such a sludge or methane from a wastewater system or garbage burned to generate electricity would be acceptable

One can reduce the energy demand for a building structure most efficiently when the building is being constructed. There are several programs that have been implemented in Arizona, including the City of Scottsdale, the Cocochino County's residential Green Building Program, and the national Green Building Council's LEED business and industrial building standards. The term "high efficiency building structures" will be used to denote an objective goal converted into a "factor" to reduce the new customer charge based on the energy efficiency designed into a new facility.

This proposal will provide infrastructure costs to the load serving utility (of last resort) who has to develop and add equipment, plans, crew training; maintenance, repair and inspection services necessary for all customers which will have to be expanded to cover additional infrastructure costs that the growth required by both customers and distributed generation in its service area.

## **2. Calculation of the EPS Charge for New Construction Facilities.**

This **EPS Charge** is for new construction facilities, or any addition of 1,000 square feet or larger. The following formula will be used:

$$\begin{aligned} \text{EPS Charge} = & \text{Utility Infrastructure Cost} \\ & \pm [(\text{Facility Energy Factor} \times \text{EPS facility charge per} \\ & \text{square foot}) \\ & - (\text{Customer Owned Renewable Energy System cost})] \end{aligned}$$

$$\text{or EPS Charge} = \text{UIC} \pm [(\text{FEF} \times \text{EFC}) - \text{CORES}]$$

$$\text{or EPS Charge} = \text{UIC} \pm \text{Energy Adjustment}$$

**3. Determination of the Cost for each term of the EPS Charge.**

a. **Utility Infrastructure Cost (UIC)** will be charged base on customer categories and conditions below.

<b>UIC =</b>	<b>CUSTOMER CATEGORY AND CONDITION</b>
\$500	• For residential customers under 5,000 square feet
\$1,000	• For residential customers over 5,000 square feet • For business and industrial customer under 5,000 square feet
\$2,500	• For business and industrial customers between 5,000 and 10,000 square feet
\$4,000	• For business or industrial between 10,000 and 20,000 square feet
\$8,000	• For business or industrial between 20,000 and 40,000 square feet
\$10,000	• For business or industrial greater than 40,000 square feet or for any customer, including industrial, with a peak demand that exceeds 1 MW

b. **Energy Adjustment** equals the **Facility Energy Cost** minus **Customer-Owned Renewable Energy System (CORES)** cost which are discussed below,

Where,

$$\text{Facility Energy Cost} = \text{Facility Energy Factor} \times \text{EPS Facility cost per square foot}$$

or  $\text{FEF} \times \text{EFC}$ , as shown below.

c. **Facility Energy Factor (FEF)** The FEF is a factor that represents the design energy efficiency of the facility. When there are energy waivers required for the facility, the FEF will be increased by 0.10 for each such waiver. The traditional facility that meets local building codes, will have an  $\text{FEF} = 1.0$ . If various energy efficiency measures are designed into the facility, using standard rating scales, then the FEF can be reduced from 1.0 to as low as 0.25 when the "entry" level or Green LEED rating has been reached.

If the "advanced" or Gold LEED rating is reached, the FEF will equal 0.00 and the overall energy adjustment will be zero. Only when the FEF is zero, the Customer-Owned Renewable Energy System (CORES) cost can continue to offset the UIC to no less than zero. In this case, both an energy system and high efficiency structure is required for a zero EPS Charge.

<b>EEF =</b>	<b>CONDITION</b>	<b>CALCULATION</b>
Add 0.10	If any energy deviations or variations are required	Increases 0.10 for each energy waiver

EEF =	CONDITION	CALCULATION
1.00	For any structure that complies with local building code, with no deviations or waivers	None
Between 1.00 and 0.25	Based on the percentage the structure achieves for "Entry" level residential or Green LEED rating for business/industrial facilities	Decrease based on percentage of points achieved to total points available to 0.25 for Entry or Green rating
0.25	If Entry level for residential or Green LEED rating achieved for business/industrial facilities	None
0.00	If Advanced level for residential or Gold LEED rating achieved for business/industrial facilities	None

Passive and active energy systems included in the design will be accounted for in determining the Facility Energy Factor (FEF).

- d. **EPS Facility cost per square foot (EFC).** This is a set cost depending upon the customer category and size of the facility.

EFC PER SQUARE FOOT	CUSTOMER CATEGORY
\$2.00	All Residential and business structures under 10,000 square feet.
\$2.00 to \$4.00	All Business structures between 10,000 and 20,000 square feet.
\$4.00	All Business structures greater than 20,000 square feet.
To Be Negotiated	All industrial customers with \$50,000 being a minimum.

- e. **Customer-owned energy system (COES).** This is the total cost of an installed-EPS approved fuel source, system that can be used offset the Facility Energy Cost.

#### 4. Discussion of the terms of the EPS Charge.

- a. The **Utility Infrastructure Cost (UIC)** will always be paid to the load service utility for all new construction facilities, including residential, business and industrial sites. Other categories shall also be paid, as structured using these guidelines, when determining their tariffs.

The UIC shall be used by the utility to cover its installation costs associated new construction, and shall include installing all electrical systems underground for all residential projects of three homes or more, all businesses, and, when appropriate, distribution lines at industrial sites. The UIC will be used only for new installation costs, including underground systems, and such expenditures shall be audited and reported in its Annual EPS Report to the Commission and in rate cases. Any costs which exceeds the UIC shall be considered in next normal

rate case and if costs do not exceed the UIC, then such remaining funds shall be deposited into that utilities EPS Bank account.

- b. The **Energy Adjustment** is added to the UIC to equal the EPS Charge. If the customer installs customer-owned energy systems and/or builds a facility that has a high-energy efficiency rating, in all likelihood, it may have a zero Energy Adjustment. The Energy Adjustment can only be less than zero only if the Facility Energy Factor (FEF) equals 0.00. In this case, the EIC may then be reduced and only reduced to zero. This means the facility meets both a high-energy efficiency rating (e.g., 0.00) and has a customer-owned energy system.
- c. The **Facility Energy Factor (FEF)** is used to reflect the impact of facility construction on requirements for the load service utility to add infrastructure to meet that facility demands. The average building, which meets the local building code, will have a factor of 1.0. There is no national or state level rating system for residential facility energy losses; however, both Cocochino County and the City of Scottsdale have voluntary ordinances that establish residential building standards for energy efficient homes. There is a national standard which rates business and industrial facilities coordinated by the Green Building Council. All three of these have similar rating worksheets and levels of qualification. There is a qualification level necessary to be considered by each of these with "points."

If the local building code has a facility energy rating system, it may be used. The FEF would be based on the percentage attainment of the initial (basic) qualification rating, when FEF is 1.0 which can be reduced based on the percent of energy efficiency enhancements have been included in the facility.

When this initial (basic) energy efficiency rating is obtained, then FEF will be 0.25. If additional, next qualification level ratings are obtained such as Advanced or Gold, then FEF will equal 0.00, thus there will be no Energy Adjustment, and the EPS Charge will equal the UIC.

In addition, when FEF is zero and customer-owned renewable energy system (CORES) costs are greater than the Facility Energy Cost, then the remaining CORES can be used to offset UIC until UIC equals zero. In summary, an energy efficient facility, which has a customer-owned energy system, may not incur any EPS Charges.

- d. The **EPS Facility cost per square foot (EFC)** will be used to determine the potential energy savings that the facility could easily incur over the facility's lifecycle and is a function of the square footage of residential and business/commercial facilities. EFC uses the facility size in square feet and multiplies that by \$2.00 per square foot, for smaller residential facilities increasing to \$4.00 per square foot for larger, commercial facilities. Industrial facility will have a minimum EFC of \$50,000 but will be negotiated with the utility. The utility will conduct an energy audit on the design and make conservation and efficiency recommendations, including, when applicable, recommendations for customer owned renewable energy systems (CORES). It

is expected during this negotiations and energy audit, the utility will be able to ensure modern energy efficiency methods are incorporated into the design.

- e. A **Customer-owned renewable energy system (CORES)** will be an energy generation system that meets the EPS requirements, including solar water heating systems, photovoltaic electricity generation systems, and wind-generation systems.

The Customer-owned renewable energy system (CORES) cost is the total cost of installed CORES. This will be based on the cost of materials, permitting, and labor for installation of any customer-owned energy system covered by the EPS rules.

Passive energy systems included in the design will be accounted in determining the Facility Energy Factor (FEF). Dollar-for-dollar cost of the CORES will be used to offset the Facility Energy Cost, which is  $FEF \times EPS \text{ Facility Cost/square foot}$ . If the FEF has been reduced to zero, due to a highly efficient building design, then the Utility Infrastructure Cost (UIC) will be offset, dollar-for-dollar, until the EPS Charge equals zero.

#### **5. Some implementation recommendations for the EPS Charge.**

The utility shall calculate the EPS Charge whenever a new meter installation is requested for a new facility. The customer and contractor shall be informed in writing the tentative EPS Charge. The customer may make energy efficiency improvements at the facility is being constructed, so an update to the EPS Charge will be required at least two weeks prior to expected occupancy.

The EPS Charge shall be paid and the local building inspector or department informed in writing by the utility that the EPS Charge has been paid. If the EPS Charge is not paid to the utility, then the utility will be able to put a "hold" on the facility's certification for occupancy.

#### **6. Additional EPS recommendations.**

The utility shall consider and install automated, two-way, digital meters in new construction facilities. Such meters shall be remotely readable by the utility, thus providing the capability to remotely monitor electricity usage by its customers. Further, Demand Reduction (DR) options, as discussed in the letter of 17 April 2004, reference (b), could also be considered. DR programs should be permitted to use UIS funds that can be allocated to this purpose.

The ACC Annual EPS Report shall provide an audit of all terms used in the EPS Charge, including the actual revenues and expenditures for each term. In addition, after the second year, trends shall be reported in the ACC Annual EPS Report. The ACC Annual EPS Reports shall be presented to all County Boards of Supervisors and City Councils.

#### **7. Allocation of EPS Charges.**

There are two parts of the EPS Charges: (1) Utility Infrastructure Costs (UIC) and (2) Energy Adjustment. See the Questions and Answer below.

## Questions and Answers about the EPS Charge Program and Funds.

Q1. Where will the EPS Charge funds go?

A1. The load serving utility shall expend funds from *Utility Infrastructure Cost (UIC)* in the following priority order:

- (1) For all infrastructure additions, changes or modifications required to interconnect, operate and maintain (first year only), customer-owned energy systems,
- (2) For all underground facilities installed to service this customer, and
- (3) For any remaining, to the utility's EPS Bank maintained by the load serving utility.

In some cases, such as when a customer has both a high efficiency facility with customer-owned energy system, then it is possible that no UIC will be available; however, this should NOT change the service provided to this customer when compared with those with a higher UIC.

The *Energy Adjustment (EA)*, if any, shall be added to the utility's EPS Bank.

Q2. What is the utility EPS Bank used for?

A2. This EPS Bank, maintained by the load-serving utility, shall include

- (1) **Developmental EPS (DEPS) funds** with the modified 1.1% EPS surcharges being the source to support the EPS Credit Purchase Program.<sup>1</sup>
- (2) **Commercially Ready Renewable Energy Standard (CRRES) funds**, used by the load serving utility to exceed the 1.1% EPS with biomass (including sludge, methane, and solar thermal projects) up to \$0.05 per kWh above market costs compared to the annual Palo Verde firm peak price level for the prior year. The output of CRRES shall count towards meeting the utility's EPS requirements, as stated in the 16 April 2004 paper. Recovery of CRRES shall be during rate cases.<sup>2</sup>
- (3) **Renewable Energy R&D (RERD) funds**, at 3.0% of the annual **EPS Charge**, to be payable to the ACC Utility Division to fund either ACC Utility Division-directed or for issuing RFPs to Arizona utilities and companies for renewable R&D projects, analysis, or feasibility studies. Any RERD funds, not

---

<sup>1</sup> For the details of the modified DEPS surcharge, please see the Arizona Solar Energy Industries Association (ASEIA), "A Proposal for Developing Renewable Energy Generation in Excess of 1.1% of Annual Retail Electrical Energy in Arizona," presented on 25 June 2004 at EPS Workshop 5 by Sean Seitz, President ASEIA. Also, the Arizona Solar Energy Industries Association, "How Arizonans Can Help Achieve the Goals of the Environmental Portfolio Standard," presented during EPS Workshop 1, 28 January 2004, provides excellent data to support this approach.

<sup>2</sup> This is similar to the CRRES concepts discussed in the above ASEIA presented at EPS Workshop 5 and the "A Proposal for Long Term Development of Renewable Energy Generation in Arizona" presented by Tucson Electric Power, 10 May 2004.

used, will be accounted for during rate cases, or could be returned to the utility's EPS Bank.<sup>3</sup>

- (4) **Renewable Education and Training (REAT)** funds, at 3.0% of the annual **EPS Charge**, shall be directed by the load-serving utility, to appropriate contractors, builders, county and city planning and zoning employees, involved with the planning, design, installation, operations and maintenance of renewable energy systems. Any REAT funds not expended by the end of the year will revert to the EPS Bank maintained by the utility.
- (5) **Media and Advertising (MAA)** funds, at 1.0% of the annual EPS Charge, shall be directed by the load-serving utility, to various forms of media, including radio, television, newspapers, web pages and public meetings. These media expenses are aimed at providing publicity to the utility's EPS programs with emphasis on customer-owned information including planning, design, installation, operations and maintenance of renewable energy systems information. Any MAA funds not expended by the end of the year will revert to the EPS Bank maintained by the utility.
- (6) **Utility Renewable Energy System (URES)** funds, up to 25% of the annual EPS Charge, shall be directed to provide capital funds for utility-owned renewable energy systems. Any URES funds not expended by the end of the year will revert to the EPS Bank maintained by the utility.
- (7) **Customer-Owned Renewable Energy System (CORES)** fund, at least 68% of the annual EPS Charge, shall be provided to support up to 50% of the cost for any customer-owned renewable energy systems. The EPS Bank will be the source of these funds.

Q3. Why do we need to charge "new" construction facilities?

A3. At present, the utility does not receive any additional funds for providing the infrastructure required to support renewable systems and is not required to have underground wiring for developments as small as three units. The existing utility customers have to fund, via rate cases, new utility infrastructures, sometimes purchased a decade or more in advance. This will relieve some, but not all, of this pressure on the utility and provide, via a priority order for spending this Utility Infrastructure Cost (UIC) to support renewable energy needs.

Q4. Why won't the present 1.1% EPS funding be adequate?

A4. During EPS Workshop, a total of less than 2,700 residences (each with a 2.5 kW system) are to be funded by TEP, APS and UNS Electric per year to expend their ESP funding. At this rate, it will take over 370 years to reach the goal for 1,000,000 Arizona homes to have customer-owned energy systems. These goals in reference (b) were as follows:

---

<sup>3</sup> This is discussed in the ASEIA Workshop 5 presentation; however, funds for the EPS Charge are used as the funding source and control of the Renewable R&D is the ACC Utility Director.

**EPS Portfolio Standard Goals:**

<b>BY YEAR</b>	<b>RENEWABLE ENERGY GOAL (in Percent)</b>
In 2008	Increase from 1.1% to 2.0%
In 2009	Increase from 2.0% to 3.0% and 1.0% annually through 2021 at 15.0%
In 2021	15.0%

**Owner-Energy Systems Goals and Estimated Capital Cost Savings**

<b>BY YEAR</b>	<b>GOAL</b>	<b>SAVINGS</b>
By 2012	100,000 solar electricity generation systems, 500,000 solar water heating systems	Saving 350 MW of generation plants or \$350 million
By 2017	500,000 solar electricity generation systems, 1,000,000 solar water heating systems	Saving 1,500 MW of generation plants or \$1.5 billion
By <b>2021</b>	<b>1,000,000</b> solar electricity generation systems, 2,000,000 solar water heating systems	Saving <b>3,000</b> MW of generation plants <b>over \$3.0 billion in utility capital funds</b>

The proposed schedule of 2,700 residences per year would take 370 years to achieve these goals. The EPS Charge will provide additional funds, above and beyond proposed changes to the DEPS, which is necessary to achieve this requirement.

Q5. Will there be enough funds with the EPS Charge to make these goals?

A5. Since new construction rates have many variables, thus, an exact answer is unknown. This proposal requires the load-serving utilities to achieve the new renewable energy goals, which will increase at 1.0% per year starting in 2009.

Q6. How can load-serving utilities be required to make these new EPS Goals?

A6. If a goal is not met, then the load-serving utility will not be able to recover that percentage of its costs (the amount it missed meeting the EPS goal) in the next rate case. For example, say the number of homes in the service area with solar electric systems was 1.0% below the goal for a year, then the utility will have its rate of returned decreased by 1.0% for that year. The solar hot water heating goals will only be weighted at 0.25 for changing the rate of return. If the utility exceeds their goal, then it would receive one-half of the percentage in excess of the Goal, as a higher rate of return for that year. Example, say the goal was 12% and 13% was achieved; the rate of return would be increased by 0.5%. If the goal was 15% and only 14% achieved that year, the utility rate of return would be 1% lower than the allowed rate of return. This incentives this program so the utilities will strive to exceed Goals to avoid the penalty and to achieve the above Goal bonus, every year.

**Answers to Questions and Recommendations  
from the 17 April 2004 letter.**

**1. Portfolio Percentage**

- ***Whether or not Arizona can and should increase its commitment to renewable energy by increasing the portfolio percentage?***

The present EPS percentage of 1.1% is much less adjacent states and the national average for states with an EPS or equivalent renewable energy standard. The highest is Maine at 30%. The Governor of California is pushing for at least 20%. A need for more diverse, distributed, and renewable energy is well documented and is essential for future growth in the Great State of Arizona.<sup>4</sup>

The present 0.8% to 1.1% portfolio standard encourages instead of discouraging, further development of non-renewable energy fuel sources, namely coal and natural gas generation plants.

**Recommend** the portfolio percentage be **gradually increased to 15%** over a period fourteen years as follows:

- In **2008**, to increase from **1.1% to 2.0%**.
- In **2009**, to increase from **2.0% to 3.0%** and, then **1.0% annually** through **2021 to 15.0%**.

The A.A.C. R14-2-1618B.3 EPS process should be modified so that starting in 2008, with monetary bonus incentives developed when accomplishments exceed and penalties for failure to achieve the standard.

**2. Expiration Date**

- ***Elimination of the Environmental Portfolio Standard expiration dates?***

The present expiration date impedes the utility industry to invest in long-term projects to support this program or to leverage their EPS funds to capitalized additional benefits for its customers.

**Recommend** the expiration date be changed to **2025**, and automatically renewed, unless contested, for an additional five-years in 2015 and 2020, thus extending to **2035**. This should permit confidence and reduce financial long-term risks due to possible reduction of this program.

---

<sup>4</sup> See *Cost, Benefits, and Impacts of the Arizona Environmental Portfolio Standard*, by the ACC Cost Evaluation Working Group, June 30, 2003, with benefits discussed in Section IV and Appendix 2.

### **3. Technology & Mix**

- ***Consideration of inclusion of new and emerging technologies as part of the review of the appropriate resource mixes.***

The long-term future of energy solutions appears to be mostly hydrogen-centric oriented; however, there are many implementation steps that may impede this energy source. Other technologies, involving known and unknown solutions, need to be considered. The only technological solutions that should not be considered involve coal, natural gas, or nuclear energy sources.

**Recommend** no restrictions be placed the technology mix.

- ***Allocation of funding among various technologies.***

Arizona, by all measures, is the best state for solar energy. The average home receives eight times is energy demands on its roof. The utility infrastructure is minimized for solar electricity generation systems. The utility infrastructure does provide a backup power source, and is necessary when a solar system does not have a storage capability. In addition to electricity generation, solar hot water heaters, can reduce between 20-35% of the average home's energy needs, and needs to be encouraged due to the rapid return on investment for homeowners.

**Recommend** the present 60% or greater allocation towards solar energy devices is continued with additional interest towards solar water heaters. It is further recommended that the following goals be established:

By **2012, 100,000 solar electricity generation systems** are installed in Arizona  
By **2017, 500,000 solar electricity generation systems** are installed in Arizona  
By **2021, 1,000,000 solar electricity generation systems** are installed in Arizona. [This can reduce demand at least 2,000 MW or five 400 MW powerplants, siting, transmission lines, with pollution health threats and save over \$2 billion in capital expenses with reduce O&M]

By **2012, 500,000 solar water-heating systems** are installed in Arizona  
By **2017, 1,000,000 solar water-heating systems** are installed in Arizona  
By **2021, 2,000,000 solar water-heating systems** are installed in Arizona  
[This can reduce demand by 500 MW, at least one 500 MW powerplant]

- ***Review of whether the approach of static percentages is still justified and if so, whether those percentages should be reconfigured, in the phase-in section of the rules in A.A.C. R14-2-1618B.3.***

See above for phase in dates, which need to be allocated to service areas, based of its customers, by rate category. If an utility fails to meet its quota, then if will have its rates reduced by the percentage it failed to make its quota, if it exceeds its percentage by 2%, for the above dates, then for every additional two percent above its "quota"

percent, it will be given a 1% bonus for next five years. This pertains to both solar water heating and solar electricity generation systems, by customer categories such as residential, business, industrial and municipal streetlights.

Example, in 2017, the utility service area should have 10% solar water-heaters, 5% electricity generation systems and 11% had solar water-heating systems, and 9% had electricity generation systems. There would be a 2% increase in electricity rates, as water heaters were 11-10, less than 2% or no impact and solar electric systems were 3% above goal, thus allowing a 0.5 % automatic rate increase for five years (next EPS goal line) as profit for achieving the goal.

#### **4. Funding Issues**

- ***A discussion of increasing the Environmental Portfolio Standard funding levels.***

The present system of funding does not encourage distributed generation nor does the EPS funding scheme encourage residential, business, or industrial customers to invest in ownership of energy generation devices. The primary benefactors are the utilities, who have demonstrated this by large, centralized, solar "power plants" from their century of such experiences. The paradigm shift and transformation of this industry towards renewable, distributed energy sources has not been accepted by the major utilities in Arizona. For example, TEP has less than 100 photovoltaic systems (total 160 kW in TEP's areas of responsibility while it has used EPS funds primarily for its single 3,800 kW "solar plant".

**Recommend** funding shift from the utilities to ratepayers after 2008. The EPS surcharge should aid both initial investment and operations. Initial investment incentives include tax credits and other incentives, such as in the following Arizona legislature bills, which have passed the House and are waiting approval by the Senate:

- AB2613 Increases solar energy credits to \$5000 for individuals and to \$25,000 for businesses
- AB2526 Provides property tax reductions for businesses with over 10% solar energy devices
- Ab2527 Provides for solar and renewable energy sources for Arizona schools
- AB2528 Requires energy audits every 12-years for state buildings and cost/benefits analyses.

**Recommend** the Commission encourage the Arizona Senate to strongly consider passage of all four of these to provide ratepayer tax credits, conserve Arizona school operations and maintenance funds, promote business usage of solar energy devices, and audit all Arizona state buildings. These bills provide capital investment incentives for all customer categories throughout the state, including schools and state-operated facilities.

**Recommend** true net metering be required throughout the state by all public service utilities for renewable energy generation, whenever the fuel source is other than coal,

natural gas, or any petroleum product and the fuel is compliant with all environmental regulations, such as clean air and water statutes. True net metering will benefit the small-distributed generation system owners by having the utility purchase, at its retail rate for that customer category, and sell at the same monetary value. NO additional surcharges will be permitted for systems smaller than 50 kW.

- ***Whether or not Arizona can and should increase its commitment to renewable energy by increasing the surcharge?***

The state should increase its commitment to renewable energy; however, increasing the EPS surcharge will not incentives the required direction needed to make advances in renewable energy. The proposed AB2613 tax credit incentive, plus potential federal tax credits, should motivate most new homeowners and businesses that incorporation of both solar water-heating and electricity generation during initial construction is when such investments are best made. Carrying the cost in one's mortgage with lower utility bills for decades is another monetary incentive.

**Recommend** shifting funding emphasis of the EPS surcharge towards customer installations. As shown in various reports, the utilities centralized "solar" power plants and other means will never achieve meaningful results necessary to achieve the above EPS percentages. In view of a decrease in new utility infrastructure requirements, extensive savings in capital investments will result.

**Recommend** that monetary incentives be developed for customer installations to account for the numerous other incentives used in the utility industry including interest-free loans, guaranteed ROI, tax credits, valuations at 25% market value for property tax that are not available to residential, business, industrial or governmental customers. Such incentives could be to establish low-interest EPS loan programs, low down payments, customer and contractor training and educational programs, bulk-purchases, and many others. The Commission could use the utility or another entity to manage these incentives.

**Recommend** utilities be required to leverage all EPS funds, with at least a 1:5 ratio of EPS funds received to long-term loans. With this program continuing for decades, this will permit payback over the life-cycle of EPS energy devices. These public service utilities will monitor all renewable energy projects in its service area for compliance with the appropriate IEEE or other design standards to ensure conformance with standard interconnection devices.

**Recommend** the ACC Staff establish standard distributed generation interconnections for use by all utilities throughout the state. Such interconnection standards are critical for builders, electricity industry workers, utilities, and are necessary to facilitate all renewable additions to the state's energy grid. Further, the ACC Staff should establish a simple, one-step process for interconnecting to promote interoperability and facilitate distributed generation.

- ***Restoration of Demand Side Management funding.***

A Demand Side Management (DSM) program has one goal: **to reduce demand**, primarily shift demand from "peak" to "off-peak" hours.

DSM is NOT a conservation program nor is DSM an efficiency program. These two are very important but are not realistic candidates for DSM funding.

There are many ways to accomplish DSM. A recent article<sup>5</sup> indicated that 7/8<sup>th</sup> of the customer's volunteered to have a load management system, installed on their distribution panel, which permitted to utility to remotely control (1) air conditioning, (2) electric hot water heaters, and (3) pool equipment. The two-way control system even permitted an over-ride capability, which was used about 1.5%. For this, a customer credit of \$6.00 for controlling air conditioners (up to five consecutive minutes off) and \$3.50 for water heaters was shown on each month's bill. What were the resultant benefits for the utility? It **avoided building 10 new 400 MW power plants to "clip" peak loads**. NO other incentives provided by the State Utility Commission, such as DSM funding, because the utility made money by saving capital investment with this program.

The overall result of DSM will be fewer power plants, less transmission line requirements, and similar results found by the ESP program.

Further, APS has a digital meter program which shows current usage. This is similar to the current miles/gallon meter in hybrid automobiles. Such modern, digital meters can show actual cost and total usage and cost since reset. This enhances conservation and energy efficiency while augmenting the above load management program.

A review of Semi-Annual DSM Reports in 2000 and 2001 submitted by Citizens Utilities, showed nearly non-compliance with "demand side management" since only bill fillers and a few energy audits were accomplished for over \$200,000 in return. At that time, filings and data requests strongly recommended careful auditing of DSM program for real reductions in demand. Billing fillers are not DSM.

**Recommend** utilities strongly consider replace all analog meters with two-way digital meters on a long-term program; say ten years, with capital costs recovered during routine rate cases. With such meters, then aggressive DSM, energy efficiency, and conservation programs can be initiated, such as the one described above.

**Recommend**, when and if an RTO is established in or for Arizona, a continuously updated web-based display be developed that shows actual and forecast demand conditions. Use of current demand data should give the public awareness of the current status of the Arizona electricity system. The California ISO display at <http://www.caiso.com/outlook.html> (and its details at lower pages) will be essential for conservation and DSM.

---

<sup>5</sup> See *Transmission & Distribution World*, February 2004, "Mega Load Management System Pays Dividends: FPL and customers benefit for demand-side management program. Customers are paid to participate, while the utility meets peak load without resorting to new generation," by Michael Andreolas, FPL, pp. 33 to 37. Copy provided to Mr. Ernest Johnson, Utility Division Director during EPS Workshop Number 1.

**Recommend** DSM funding be used only to pay for achieving demand reductions in actual, measured loads. The scheme discussed below, provides incentive to flatten the demand curve. Measured monthly loading spread, for this purpose, will be determined by

- (1) Monthly Average Peak (max) Load determined by summing each day's Peak hourly demand,
- (2) Monthly Average Minimum Load determined by summing each day's Minimum hourly load,
- (3) Monthly Demand Spread as the difference between (1) and (2); (4) Ratio of this year's Peak-Min Demand Spread to the same month Peak-Min Demand Spread for that month of the prior year. If the ratio is less than 1.00, the Peak Demand Spread has been reduced, and if higher, Peak Demand Spread has increased.

For a monetary incentive, the rates can be increased 50% of a Demand Spread reduction, but increase by the ratio of any increase, during next rate case. Example: (from 1) Peak Daily Average 110 MW, (from 2) Minimum Daily Average was 62 MW. Difference (from 3) is 48 MW. Prior year was 50 MW. Ratio (from 4) is  $48/50 = 96\%$ . A 2% positive rate adjustment is credited for DSM consideration during next rate case. If the Ratio was 1.04, then a 4% rate debit adjustment could be made. The Commission would have an objective measure for DSM.

**Recommend** no additional funding be dedicated to DSM. If DSM funding is returned, recommend the ACC Staff or an outside contractor (under a performance incentive contract) monitors careful audits of all DSM expenditures.

Sincerely,



Marshall Magruder

520.398.8587

[marshall@magruder.org](mailto:marshall@magruder.org)