



OPEN MEETING AGENDA ITEM

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From: Arizona Corporation Commission
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Solar Water Heating
Considerations for a Solar Water Heating Program.docx

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DOCKETED BY
Commissioner Forese, *JK*

ORIGINAL

My name is Jim Combs and I've been a Solar Water Heating (SWH) contractor here in Arizona since 1982. Our company, Conservative Energy Systems, Inc. is a family business that my father and I started during the solar boom of the 1980's. I believe we are recognized as not the largest but the most knowledgeable and ethical company in our technology. Our customers range from former Corporation Commissioners and ACC staff in residential applications to Honeywell, APS, BLM, Santa Fe Rail Road, Phoenix Federal Correctional Institution and most recently two large SWH systems at Intel on commercial applications. I was also a founder of the Arizona Solar Energy Industries Association (ARISEIA) and was a three term president, 20 year board member as well as a board member of national SEIA for 3 years.

I'm hoping you have time to read some things here regarding our position on SWH as it relates to the Renewable Energy Standard Tariff (REST) for 2016. We did have a meeting set up at your office this summer that you had to cancel after we had arrived due to a family emergency but I think sometimes having things in writing is a better form of communication anyway.

First and foremost is that we have been talking to one of the Commissioners about raising the incentive amount for SWH from .30/kWh savings to .50 without raising the amount of the total fund. At the .30 rate there has been little interest from consumers to subscribe to the program whereas when the incentive was .50 there were over 2,000 customers in the APS territory per year. This Commissioner that I mention (I'm not sure I can mention him by name under some of the ACC rules) has astutely pointed out that it will be a clear determination if the incentive amount is the driver of the usage and since no new funds will be required to test this theory he feels that it is a worthwhile test. We would hope that you agree and would support any amendment in that regard.

I'm well aware of the initial reactions against this incentive but I think an objective analysis makes it clear that it is needed and justified in this new era of energy management. What is typically brought out against any incentive is that it is not the government's place to prop up a product, "if it is good it should stand on it's own." And of course the comeback is that in a monopoly situation like the APS electric utility, incentives need to be used to level the playing field and help create a competitive market environment for the benefit of consumers. This has been one of the main themes of the debate about solar electric or PV. What has been lost in that debate is the clearcut advantages of SWH over PV as a renewable roof top solar technology with the resulting lack of support for SWH. (I'll include an attachment here that goes over the advantages of SWH which I hope you will review closely). All of the facts were documented and referenced for Commissioner Bittersmith's advisor Laurie Woodall who is a real stickler for details. It shows the discrepancy of money spent on PV vs. SWH, in the REST (\$154M vs. \$12M), the payback advantage of SWH vs. PV, the financial access to SWH vs. PV for the average consumer, and the current incentives for PV vs. SWH (\$500-\$600/year for 20 years in net metering incentives for PV or \$10K to \$12K vs. .30/kWh saved for a SWH system or typically a total of about an \$800 one time incentive.)

PV has recieved fantastic reviews as an innovative technology with remarkable cost reductions over the past few years. In the meantime there has not been similar cost reductions for SWH and some point to that as a criticism of the technology and reason to abandon incentives for it. However, to make an informed judgement a consideration of some of the facts I referred to above need to be applied. Even with all the reductions in cost for PV it is still not as cost effective as SWH in rooftop applications and if it had just 25% of the funding that PV has recieved it would be that much more cost effective due to increased sales with cost reduction from economy of scale. The fact of the matter is that the incentive for SWH at .30/kWh is too low to maintain a competitive alternative to electric water heating just as the \$50 surcharge for PV owners in SRP territory shut down PV sales there. And without the incentive of net metering PV couldn't "stand on it's own" in any location.

But while all of the above makes a good case for SWH incentives, the best case, especially from a regulatory perspective, is because of the APS manipulation of the energy market in the 70's and 80's when they were also the gas utility. They

stopped running gas lines to new construction areas and even when they sold the gas utility to SW Gas they paid developers to keep their housing tracks as all electric homes. How did they benefit from that? The only substantial advantage for keeping homes all electric was in the money they made/make from electric water heating. They make an extra \$40 to \$50 per home in electric sales vs. homes with gas water heating. They have an unheard of number of customers (60%) with electric water heaters vs. other states and even within Arizona. Think about how much money they've made from that over the past 30 - 40 years at the expense of consumers with no choice alternatives. I think that APS should be offering substantial incentives for a SWH alternative to make up for that market manipulation regardless if it comes from the REST, which would be a gift to them, or directly from their income as a penalty for their actions. With all due respect, I think it is the Arizona Corporation Commission's responsibility to give a choice to those ratepayers who have been forced to heat their water electrically, at a much higher cost, than those with access to gas through a fair REST incentive for SWH..To be fair it was former APS managers and Corporation Commissions that this manipulation occurred under but there is no valid reason for it not to be addressed today.

Commissioner, thank you for your consideration for the above and I hope you will agree with the conclusions that we have presented. If so, please support the increase in the SWH incentive percentage and if not please let me know how you disagree.

Respectfully,
Jim Combs - Conservative Energy Systems, Owner Since 1982
President, Arizona Solar Water Heating Alliance

P.S. I attended one of your Rooftop Solar workshops (had hoped that you might include SWH) and came away with respect for your intelligent analysis of complex ideas. There is a quote I came across that sums up why I've stayed in the SWH field for the past 34 years that I thought you might appreciate.

" Hope is definitely not the same as optimism. It is not the conviction that something will turn out well, but the certainty that something makes sense regardless of how it turns out." Vaclav Havel talking about his "hope" for democracy over communism.

Considerations for a Solar Water Heating Program

- 60% of APS and SRP residential customers have electric water heaters vs. 11% in California and 15% in Colorado. Natural Gas is not available to them. That amounts to 1.2 million customers who have no choice but to pay for the much more expensive electric water heating (Source: US Energy Information Administration)
- A major reason for the above discrepancy is that APS was the Valley's gas supplier during a period of huge residential growth and put a moratorium on gas service to many areas. They benefit greatly from this captive customer group in that as much as 25% of many customers electric bill goes to heating water electrically. (Source: SRP Energy Efficiency Video)
- Solar Water Heating (SWH) can save as much as 90% of a homeowner's electric water heating costs. (Source: ASU FINAL REPORT: HOW MUCH ENERGY IS SAVED BY SOLAR DOMESTIC HOT WATER SYSTEMS? College of Engineering and Applied Sciences)
- "Monthly fuel costs vary, but usually range from \$29 to \$41 per month for electric water heaters" based on 1990's APS electric rates. (Source: APS Consumers Guide to Solar Water Heating)
- A quality SWH system is roughly equivalent to a 2kW Photo Voltaic Solar Electric system (based on converting a SWH system kWh saved to kW's) A SWH system cost per watt is slightly less than a PV system cost per watt but is substantially less when money is leveraged from the cost of replacing a leaking electric heater.*)And a standard SWH system's total cost is less the 1/4th the cost of a standard PV system)
- Virtually all homeowners that have a leaking electric water heater can afford to replace it with a SWH system unlike PV which is only cost effective for the largest users of electric (those with large homes and pools). PV leasing companies won't even talk lease unless a person has an average monthly electric bill over \$150. In effect the lower consumers of electric end up paying for the larger users through NEM.

- As APS advertising mentions in ads about the Gila Bend Solar Thermal installation, this type of solar stores energy even “after the sun goes down”. This is also true to an even larger measure by residential SWH systems which has a beneficial effect on peak demand according to SRP research.
- \$158M of REST funding has been spent on PV vs. \$12M on SWH
- At the current rate of .30/kWh incentive for SWH only a little over 200 systems have been installed this year (2014) in APS territory indicating that it is not an effective rate.
- Based on average PV system sizing the carryover of unused kW’s from winter months typically amounts to between \$700 and \$800 in net metering benefits to PV owners. Subtracting out the cost of electric during those months from Palo Verde leaves approximately \$500 to \$600 in a premium that APS/Non PV ratepayers contribute to PV owners per year. It is an incentive that amounts to as much as \$12K over 20 years and it is what drives PV sales.
- Replacing an electric water heater with a SWH system has the effect of removing the equivalent amount of pollution as removing 1/3 of a car from the road. (Source: Environmental Protection Agency)
- The key to adoption of SWH as a replacement to electric water heating in order to take advantage of the clear cut and unrivaled objective benefits is promotion which APS has stonewalled for the past 30 years.

The Arizona Solar Water Heating Alliance has presented the above facts to the Governor’s Office of Energy Policy, RUCO, APS and 3 of the 5 returning Corporation Commissioners and their advisors. A common theme is a response of disbelief of SWH’s effectiveness in harnessing solar and being energy efficient. One Commissioner’s advisor said if this is all true than I can’t understand why SWH isn’t being adopted by so many more people. The answer is that SWH needs massive promotion by the utilities but understandingly they are reluctant to decrease their profits which greatly exceed virtually all other electric utilities in the U.S. from heating water

electrically. It will take the leadership of the Corporation Commission to make that happen for the benefit of all Arizonans.

*Based on the average electric water heater replacement cost of \$800.