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RE: Docket No. RE-00000C-00-0377

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This letter provides additional and complementary information on the *Proposal for Developing Renewable Energy Generation in Excess of 1.1% of Annual Retail Electrical Energy in Arizona* (advocates' proposal) submitted by the Arizona Solar Energy Industries Association on behalf of fifteen supporting organizations on May 12, 2004. The advocates' proposal supports the existing Environmental Portfolio Standard (EPS) and makes recommendations on an approach to develop additional renewable energy resources based on technology maturity and costs.

This analysis is an effort to relate the EPS discussion to Arizona's expected growth in electricity demand which will require that regulated utilities acquire substantial additional supply and demand side resources. The analysis shows that developing a realistic combination of energy efficiency and renewable energy resources can meet a significant portion of this demand growth and do so at reduced costs to ratepayers.

Conclusions

Summaries of the costs and effects of the advocates' proposal, which retains existing EPS goals and creates a new standard for low cost renewables, are attached. The analysis shown in Table 1 is based on a 3 percent per year electricity demand escalation rate (consistent with analysis parameters suggested by ACC staff). As this growth continues, Arizona must either develop substantial new resources or purchase electricity. The spreadsheet and charts support the following conclusions:

- Chart 1 shows that developing a realistic combination of energy efficiency and renewable energy resources can meet a significant portion of this demand growth.
- Chart 2 shows how leveraging DSM savings (return of former DSM funds plus additional DSM program funding) and providing sufficient EPS funds can help meet a portion of the demand growth with energy efficiency and solar electric technologies.
- Chart 3 builds on the second chart to show that requiring regulated utilities to meet 8 percent of their retail electricity sales through a commercially ready renewable technologies program actually reduces costs for consumers when DSM, EPS, and commercially ready renewable options are considered in an integrated policy.
- Based on Arizona's growth in electricity demand, utilities will need to acquire supply and demand side resources. Energy efficiency savings are available at costs less than

wholesale energy costs. On the supply side, wind energy is less costly than gas fired generation resources. Recent wind energy contracts deliver energy and associated capacity for approximately \$0.04 per kWh, including transmission, interconnection, and integration costs.

- Each kilowatt hour of electricity derived from energy efficiency or renewable energy resources will reduce emissions of toxic mercury, oxides of sulfur and nitrogen, and carbon dioxide. The charts do **not** include the value of these emission reductions.
- Each kilowatt hour of electricity derived from energy efficiency, solar or wind resources saves about one half gallon of water.
- Congress is expected to approve an extension of the Production Tax Credit through 2006. For wind, this equates to a federal subsidy of about one third of the total cost of resource development, and solar electric will likely be included in the new legislation. Any new EPS should set near term targets to encourage development activity that would take advantage of this tax credit.
- The technology mix for the commercially ready portion of the proposal is unspecified. It seems likely the utilities will rely heavily, but not exclusively, on wind energy that can be implemented at lower cost than natural gas generation. The existing EPS will support the continued reduction in solar energy costs realized to date.
- Developing Arizona renewable energy resources will provide income and jobs in rural areas of the state.
- Developing renewable energy and energy efficiency resources will reduce natural gas prices by reducing the demand for natural gas and will provide a hedge against future natural gas price increases.
- Developing renewable energy and energy efficiency resources defers construction of new fossil fueled generation resources in the state.

Summary of Advocates' Proposal

Emerging Technologies

The advocates' proposal supports efforts to meet the existing EPS goal of 1.1 percent of retail electricity sold by 2012 with 60 percent of that percentage being solar energy. (Minor modifications are recommended in the proposal.) The existing EPS would apply to technologies that are emerging and are in need of financial support. Only technologies that are between 5 to 11 cents above wholesale electricity costs per kilowatt hour are proposed to fall into the existing standard. In the advocates' proposal, the EPS portion of the proposal is called the Developmental Environmental Portfolio Standard or DEPS.

Additional funding must be provided for regulated utilities to meet the existing EPS by 2012. The proposal includes a mechanism for keeping the existing Surcharge rate and removing the caps to provide a sufficient amount of funding to meet EPS goals. The advocates' proposal recommends terminating the DEPS in 2012.

Commercially Ready Technologies

To support the development of more mature renewable energy technologies, an additional portfolio requirement (named the Commercially Ready Renewable Energy Standard or CRRES) was proposed. These technologies have a cost premium of less than 5 cents per kWh above wholesale electricity costs and include wind, geothermal, landfill gas, biomass, and possibly other technologies. Given today's high natural gas prices, wind and perhaps other commercially ready technologies are less costly than conventional generation. The advocates proposed that 8 percent of retail kWh sales be derived from commercially ready renewable energy resources by 2010. Sufficient renewable energy resources exist in Arizona and neighboring states to implement this part of the advocates' proposal.

Funding for this standard should be obtained through a flexible adjustment mechanism for the above-market costs or through purchased power and fuel adjustors.

Research and Development Technologies

Under the current EPS rules, between 2004 and 2012 no research and development (R & D) projects can be funded with portfolio Surcharge or system benefit funds. The advocates' proposal concurs with the current rule. Technologies that cost more than 11 cents above wholesale electricity costs should not be supported with EPS funds.

Demand Side Management

The advocates' proposal supports the return of system benefit funds to demand side management (DSM) programs.

While the development of renewable energy and energy efficiency resources may create challenges for regulated utilities, the existing EPS and the installation of large wind, geothermal, and biomass projects throughout the West have demonstrated that renewable energy can be successfully integrated into the grid. This analysis supports efforts by the Arizona Corporation Commission in developing policies necessary to create a more sustainable, diversified and secure energy future for the state.

Sincerely,



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cc: Ray Williamson

TABLE 1. Meeting Demand Growth with DSM, DEPS, & CRRES

2003 AZ Retail Sales = 36.3 MMWh; ACC assumes demand escalation rate of 3%/yr
 Wholesale electricity costs = \$.05/kWh - 2005-2006; \$.055kWh - 2007 - 2008; \$.06 - 2009 - 2010; \$.065 - 2011 - 2012
 DSM assumptions based on SWEEP Proposal for APS service territory to achieve 7% savings by 2010 (9.4% by 2012); APS approximately 2/3 of regulated utility demand; SWEEP calculations for MWh saved and cost of DSM projects increased by 1/3 to account for other regulated utilities
 All savings from DSM, DEPS, CRRES calculated from amount of resource installed in previous year; DSM savings are cumulative
 Solar Electric Costs = \$4.5/W - 2005; \$4.25/W - 2006; \$4.00 - 2007; \$3.75/W - 2008; \$3.50/W - 2009; \$3.25/W - 2010; \$3.00/W 2011 - 2012
 Solar Electric Generation Factor = 1,700MWh/MW
 Combined Biomass/Landfill Gas Project Capacity Factor - 80% or 7,008 hr/yr
 Combined Biomass/Landfill Gas Project Cost = \$.075/kWh (Assumes all 60 MW of Arizona resource is developed)
 Wind Project Capacity Factor - 35%; Geothermal Capacity Factor - 95%; Wind = 85% of CRRES
 Combined Wind/Geothermal Project Costs = \$.043/kWh - 2006 to \$.049/kWh - 2012

<u>Electricity Factors</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	TOTALS <u>2005 - 2012</u>
AZ Retail Sales Base, MWh	37,382	37,382	37,382	37,382	37,382	37,382	37,382	37,382	37,382	37,382
Retail Sales w/ Escalation, MWh	37,382	38,504	39,659	40,849	42,074	43,336	44,636	45,976	47,355	
Additional Electricity - 2004 Base, MWh	0	1,121	2,277	3,466	4,692	5,954	7,254	8,593	9,972	
Cost of Additional Electricity, \$M	\$0	\$56	\$114	\$191	\$258	\$357	\$435	\$559	\$648	\$2,618
Energy Efficiency Program Effects										
DSM Program Cost, \$M	0	\$45	\$61	\$64	\$65	\$66	\$68	\$70	\$72	\$511
Cumulative DSM Electricity Savings, MWh	0	301	719	1,136	1,554	1,972	2,389	2,807	3,224	
Additional Electricity less DSM, MWh	0	820	1,558	2,330	3,138	3,982	4,865	5,786	6,748	
Cost of Additional Electricity w/ DSM program	\$0	\$41	\$139	\$180	\$222	\$266	\$311	\$359	\$409	\$1,928
DEPS Proram Effects										
DEPS Surcharge at \$30M/yr Escalating at 3%/yr Rate after DSM Implemented, \$M	N/A	\$31	\$32	\$33	\$34	\$35	\$36	\$37	\$38	\$275
Cumulative DEPS Solar Electric Capacity Installed, MW	8	15	22	31	40	50	61	73	85	
DEPS Electricity Generated (Initial \$30M Program Escalating) MWh	0	25	38	52	67	84	103	124	145	
Additional Electricity less DSM & DEPS Generation, MWh	0	820	1,520	2,278	3,071	3,898	4,762	5,663	6,603	
Cost of Additional Electricity w/ DSM program & DEPS Surcharge, \$M	0	\$82	\$169	\$210	\$252	\$296	\$342	\$390	\$440	\$2,182
CRRES Proram Effects - 8 % RE Policy										
Biomass & Landfill Gas Projects:										
Combined Arizona Biomass/LFGas Resource Project Capacity, MW	N/A	30	60	60	60	60	60	60	60	60
Combined AZ Resource Biomass/LFGas EOY Generation, MWh	0	210	420	420	420	420	420	420	420	
Cost of Combined AZ Biomass/LFGas Generation, \$M	\$0	\$0.0	\$31.5	\$31.5	\$31.5	\$31.5	\$31.5	\$31.5	\$31.5	\$221
Additional Electricity less DSM, DEPS & Biomass/LFG Generation, MWh	0	820	1,099	1,857	2,650	3,478	4,341	5,242	6,182	
Cost of Additional Electricity w/ DSM program, DEPS Surcharge & 60MW AZ Resource Biomass/LFGas, \$M	\$0	\$123	\$180	\$221	\$263	\$307	\$353	\$401	\$450	\$2,296
Wind & Geothermal Projects:										
Combined Wind & Geothermal Generation Purchases, MWh	N/A	0	327	735	1,166	2,030	2,945	3,046	3,150	
Cost of Wind & Geothermal Generation Purchases, \$M	0	0	\$14	\$32	\$52	\$93	\$138	\$146	\$154	\$631
Additional Electricity less DSM, DEPS, Biomass/LFG & Wind/Geothermal Purchases, MWh	0	820	772	1,123	1,484	1,447	1,396	2,196	3,032	
Cost of Additional Electricity w/ DSM program, DEPS Surcharge, 60MW AZ Resource Biomass/LFGas & Wind/Geothermal Purchases, \$M	\$0	\$123	177	217	257	298	344	394	447	\$2,258

CHART 1. Arizona Electricity Demand Growth After DSM, DEPS, Biomass/LFGas & Wind/Geothermal Policies Implemented

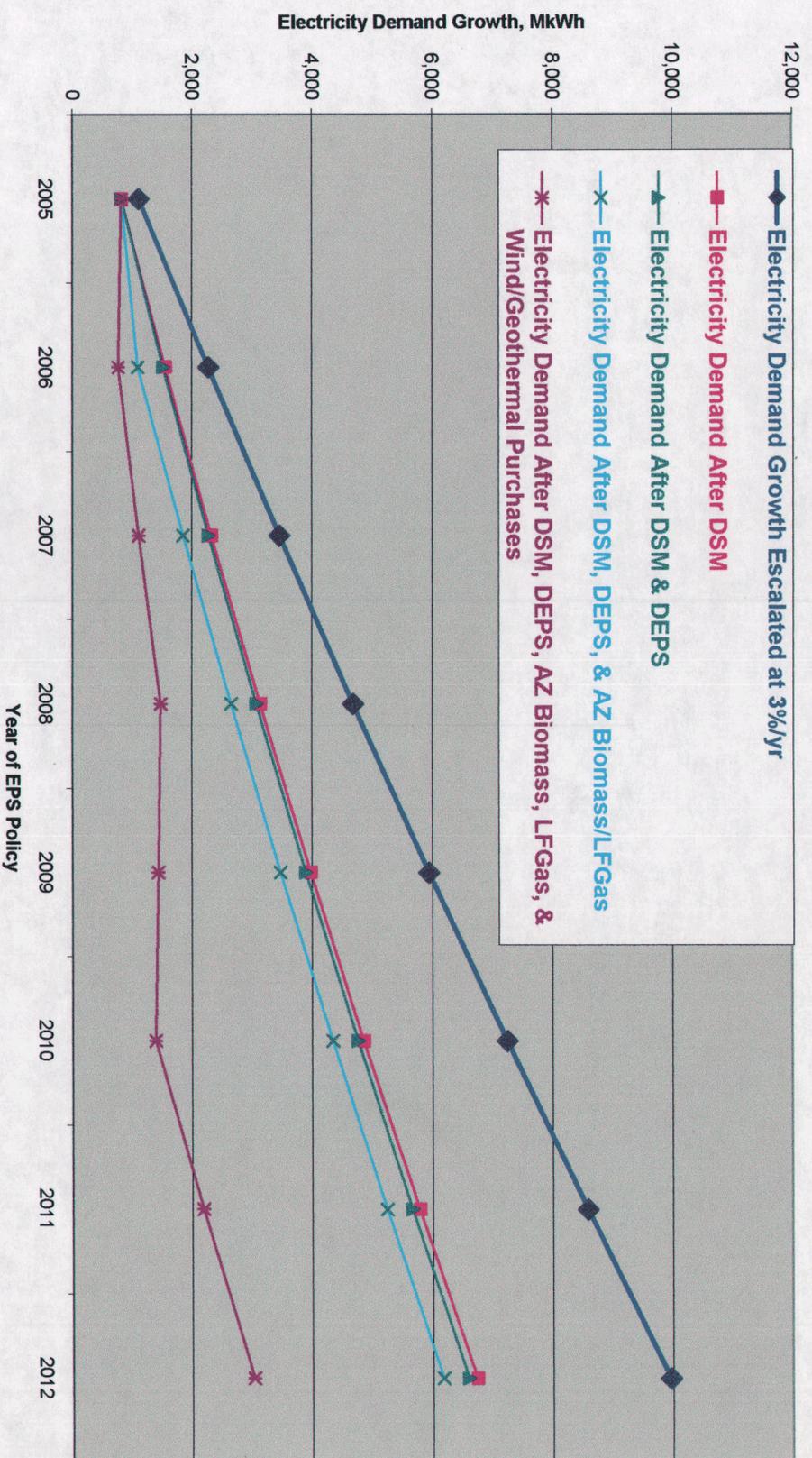


CHART 2. COST OPTIONS TO MEET DEMAND GROWTH - DSM & DEPS ONLY

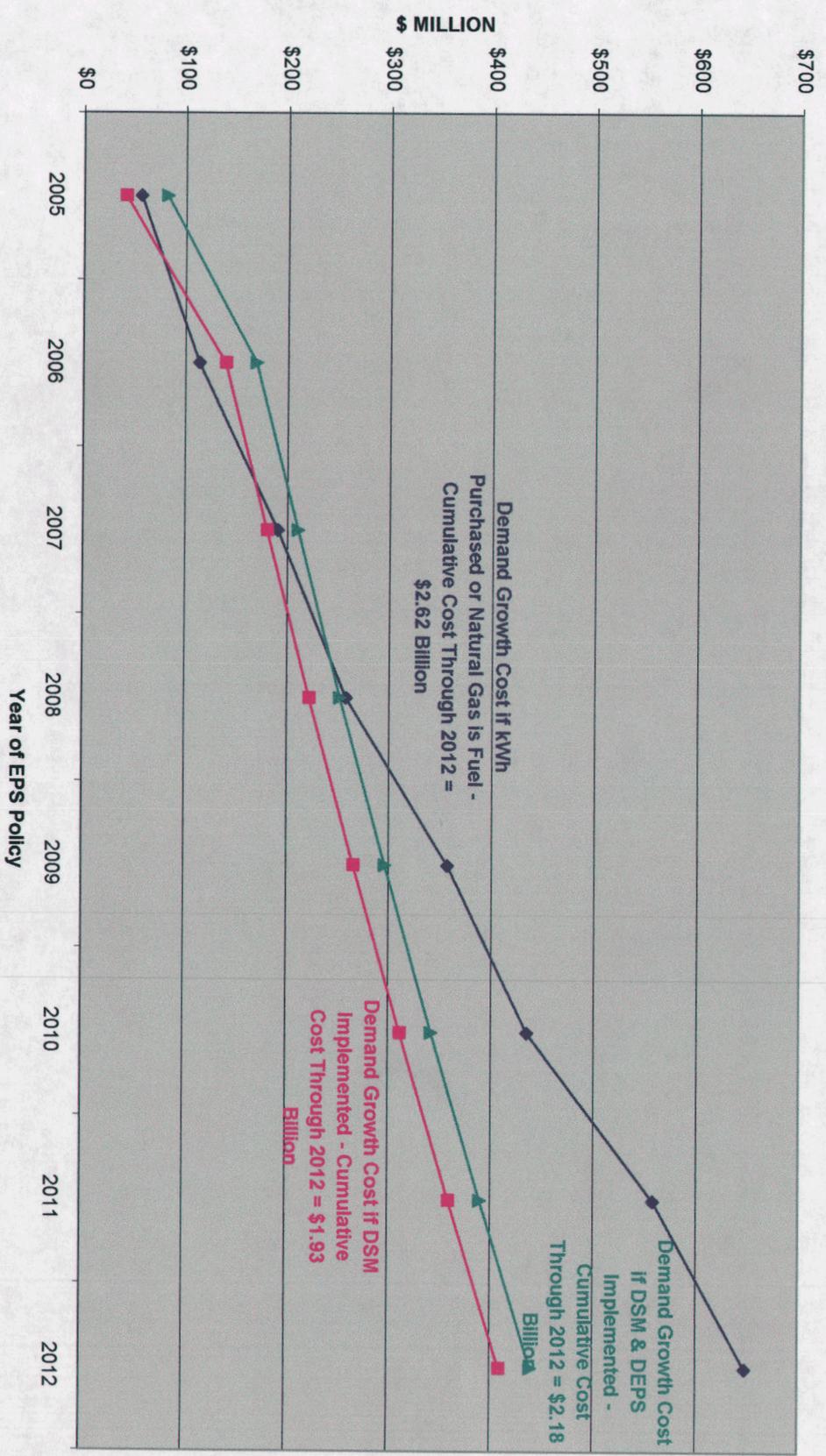


CHART 3. COST OPTIONS TO MEET DEMAND GROWTH - DSM, DEPS, AZ BIOMASS/LFGAS & WIND/GEOTHERMAL PROGRAMS

