SOLARAIRE
PIONEERING GREEN COMFORT

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Re: Docket No. 08-IEP-1A
2008 Integrated Energy Policy Report Update

California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

My name is Don Rodes. I am the founder and Chief Executive Officer of SolarAire, a developer of solar thermal air conditioning systems for commercial buildings. SolarAire and its affiliated company Bergquam Energy Systems are responsible for 4 projects demonstrating solar thermal air conditioning here in California. Several of these have been in continuous operation for over 20 years.

I am here today to advocate a technology for overcoming some of the barriers to the increased development of renewable energy sources: the lack of distribution infrastructure, the variable and intermittent nature of such renewable resources and their cost.

Heating, Cooling and Hot Water account for 20% of electricity and 70% of natural gas used in commercial buildings. Air conditioning accounts for over 50% of the peak summer load (really about 100% of the summer peak load over the winter peak load). Over 5 GW of power are required to cool the commercial buildings throughout the state. By 2020, 2 million more people will be living in the Central Valley, where the demand for air conditioning is the greatest, and therefore the energy consumed and the power required to cool buildings will increase significantly.

Providing cooling, heating and hot water accounts for the majority of energy used in buildings. And while the Commission recognizes that solar water heating can reduce the demand for electricity and natural gas, we believe it has overlooked the potential for solar thermal to mitigate as well the huge electricity demands for air conditioning, particularly in the hot afternoons of the summer months in most parts of the state.

Thermally driven air conditioning is a well established technology, installed throughout the State in buildings where waste heat can be recovered to drive a single or double effect absorption chiller. Our companies and others have adapted high-performance solar thermal collectors to provide the heat energy to these chillers.

Solar thermal cooling and heating systems are a distributed energy source; their cost of operation can meet or beat the costs the building owner would pay the utilities: the technology is robust and proven; it is deployable immediately; and it is scalable to service most commercial buildings and thus capable of significantly reducing greenhouse gas emissions.

Solar thermal HVAC has several unique advantages over other solar technologies. The energy output from a solar array can be economically stored as hot water. This allows the system to operate continuously despite intermittent clouds. Secondly, the output of a solar thermal system is elegantly in phase with the demand for cooling: it reaches it peak output in mid-afternoon. Thirdly, the cooling capacity of a thermally driven chiller increases (up to 40%) with the increase in temperature of the hot water supply. And lastly, because of storage, these chillers can operate into the early evening, thus truly shaving off the peak electricity load of the building.

Solar thermal air conditioning is not expensive. Our analysis shows that systems provide cooling, heating and hot water for buildings ranging from 1,000 to 50,000 sf. can achieve levelized costs $0.14-$0.17/kWh for displacing the air conditioning load and $0.90-$1.20 per therm for supplying domestic hot water and heating.

While awareness of the potential of solar thermal heating and cooling in this country is significantly lacking, that is not true in Europe. The European Union is aggressively investigating the viability of solar thermal cooling in Europe. Already, over 100 installations are in place today, even though all but the southern most EU countries can really benefit from solar cooling.

Unfortunately, to date, performance data on the systems that we have installed in California has not been rigorously collected, and therefore some questions remain about the viability of this technology. What types of building end-uses, in which climate zones, using what specific technologies are most appropriate?

In light of these questions and the fact that newer and smaller chillers are now available making residential applications possible, I wish to propose that the Commission consider funding a small number of projects. This could be conducted under the auspices of the California Solar Energy Industries Association, using local solar thermal contractors and suppliers wherever possible and fully monitored to verify their performance and cost of operation.

The cost of the project is inconsequential when one considers the potential impact of solar thermal technologies. With just 25% share of the HVAC and domestic hot water market in the state serviced by solar thermal technologies, the RPS objectives for 2020 can be met. I'm sure that without them, they will not.

I thank you for your time and for your attention.

Don Rodes

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