



C&I Solar Thermal

Commercial and Industrial (C&I) Solar Thermal -

- Provides air conditioning, space heating, and hot water for commercial buildings.
- Also provides hot water and heat for industrial processes.
- Flat plate, trough, or vacuum tube, producing medium temperature (over 180 degrees) water.
- Cooling provided by absorption, adsorption, or desiccant systems fueled by solar hot water.



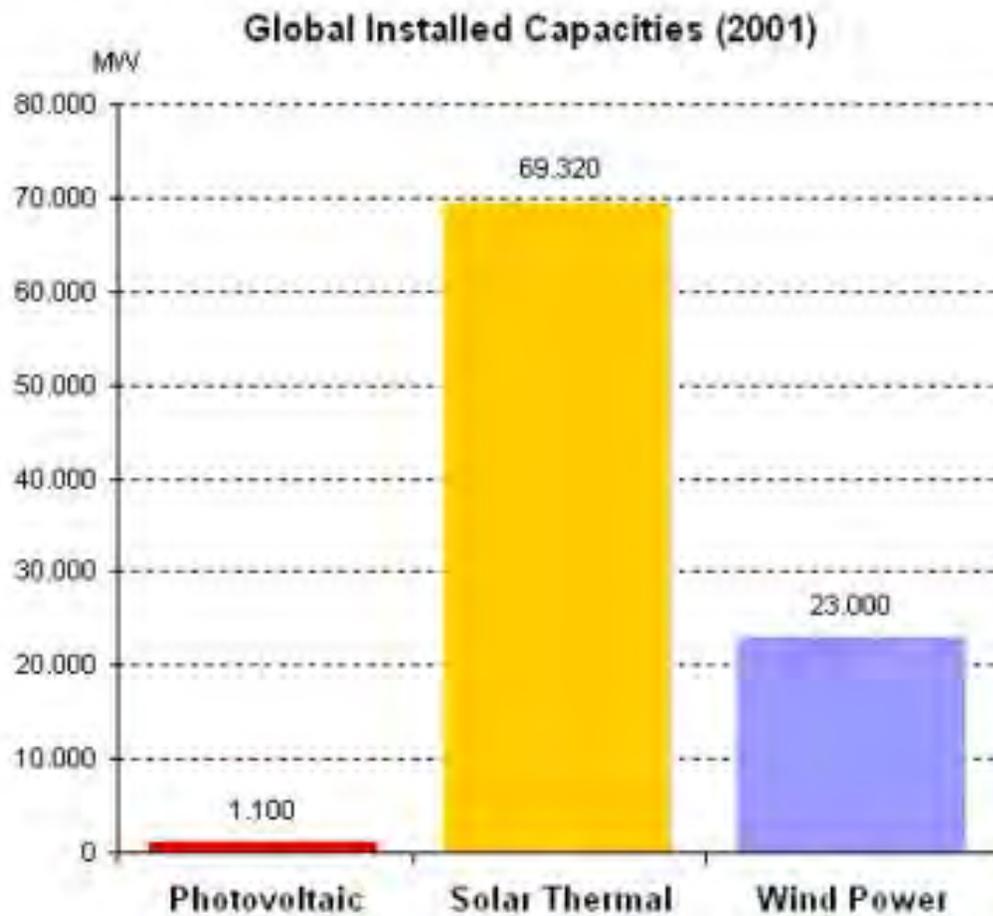
DOCKET	
02-RFN-1038	
DATE	DEC - 5 2005
RECD.	DEC - 5 2005



Benefits

- Solar Air Conditioning Displaces Electricity
- Displaces Natural Gas
- Firm
- Peak Energy
- Further Utilizes the Solar Resource
- Cost Effective
- Works with CHP Systems
- Same Benefits as other Distributed Energy
- Same Benefits as other Renewables

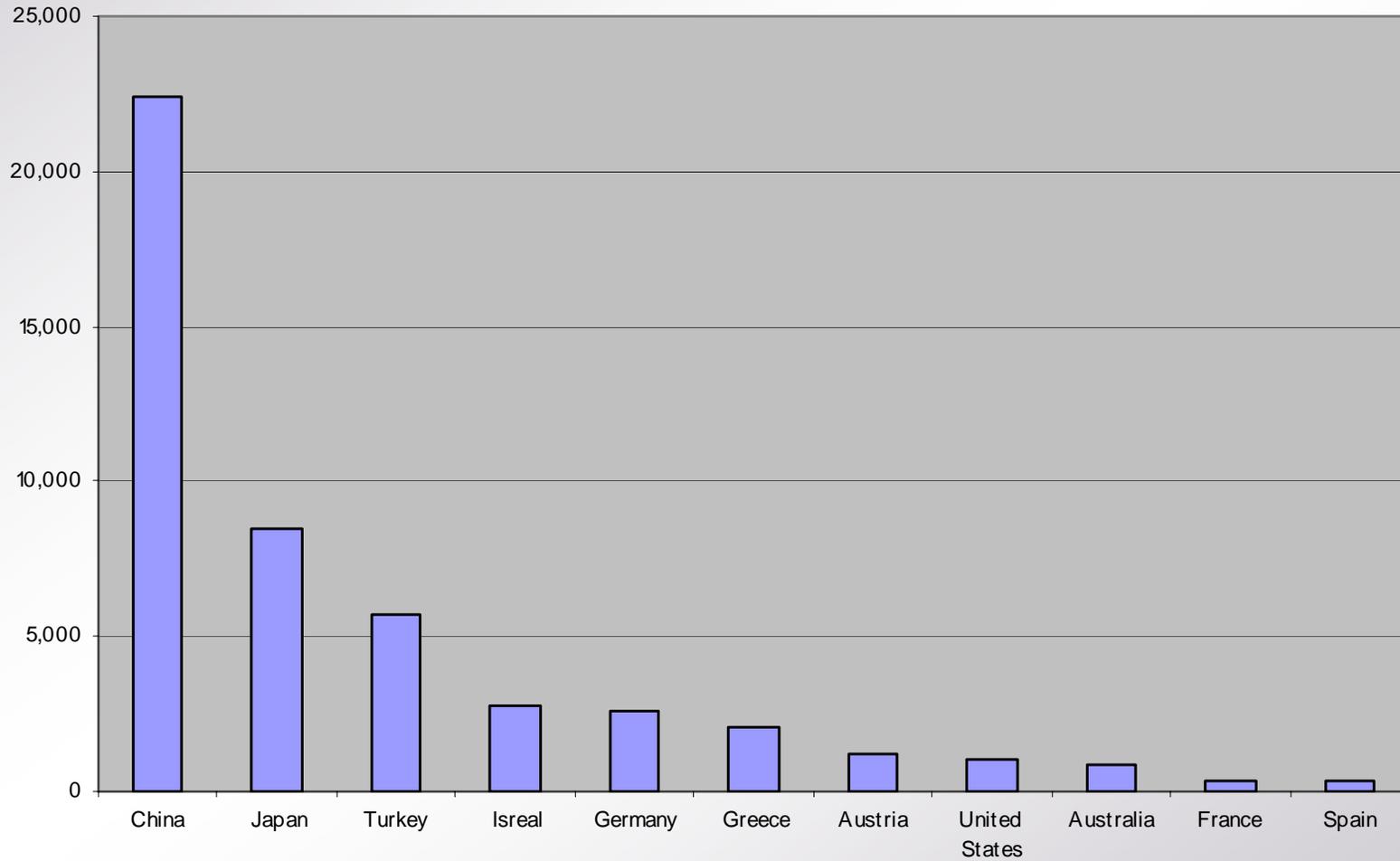
Global Capacities



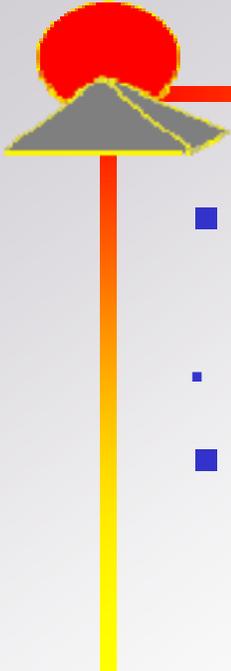
Source: European Renewable Energy Council



Global Solar Thermal Capacities



Source: European Renewable Energy Council



Further Growth

- European Union Target for all Renewables is 20% by 2020
 - (Source: European Union Renewable Energy Council)
- Projection is that Renewable Heating and Cooling Alone Supplied by Solar Thermal and Biomass can meet 25% of the Larger Target
 - (Source: European Union Renewable Energy Council)
- The U.S. can have a Similar Goal

Condominiums



Apartments



Hotels



Hospitals



Warehouse



Nature Center



District Heating/Cooling



Process Energy



Dormitories



Pools Plus Buildings



Office Buildings



Prisons



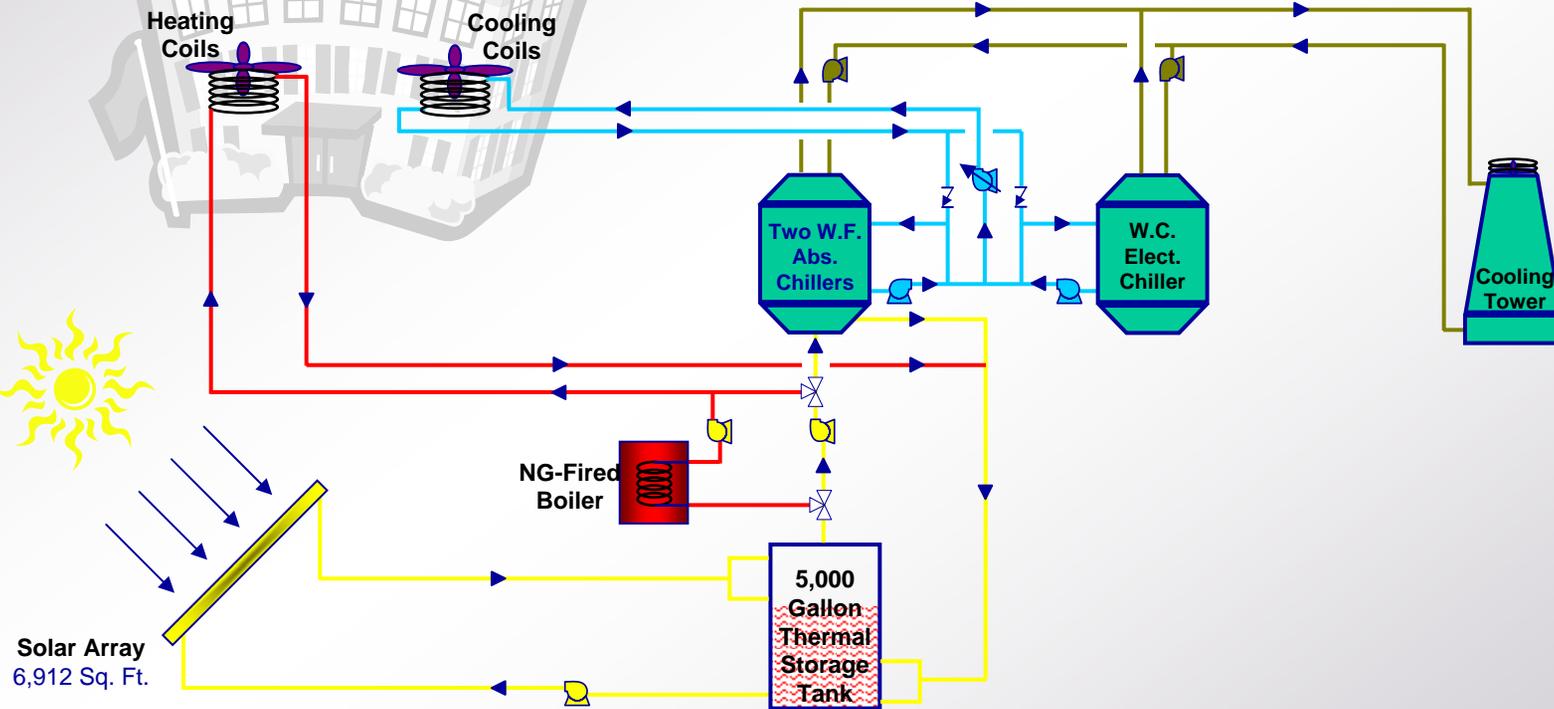


Request Addition To Program

- Must be in Overall Program Guidebook
- Suggested definition to include:
- 8 Criteria (Appendix 3) for Emerging Renewables Program

Primary Issue is Electric Generation v. Electric Displacement

Solar HVAC



- Solar Heating Circuit
- Building Chilled Water Circuit
- Building Heating Circuit
- Pool Heating/Condenser Cooling Circuit

- Constant Speed Pump
- Variable Speed Pump

- Valve
- 3-way Valve
- Check Valve

- W.F. Water-Fired
- W.C. Water-Cooled
- Abs. Absorption

- Elect. Electric
- NG Natural Gas
- Aux. Auxiliary



Add HVAC + C&I Hot Water

Number 6

“Technology must be designed so that it can produce *or displace* grid-connected electricity.”

Number 7

“Represents a new electricity *or electric displacement [or energy]* generating process.

Number 8

“Must be designed exclusively for producing electricity *or electric displacement [or energy]* for on-site use or sale.”



Criteria

Number 1

“Financial assistance required to become commercially viable.”

Number 2

“Commercially available with at least one vendor.”

Number 3

“Five year warranty.”

Number 4

“At least one year of demonstrated reliable, predictable and safe performance.”

Number 5

“Useful design life of at least 20 years.”



APS Program*

- Distributed C&I Solar Thermal
- Feed-In Tariff
- 7 cents per kWh equivalent
- 16 cents per kWh equivalent
- Incentive capped at 50% of project cost
- Projects can displace both electricity and natural gas

*Introduced November 2005, Expected Approval January 2005



Proposed Incentives for CA

- Jan-
- What do you suggest here?

Questions?

