

Rooftop Solar Thermal Technologies



WHAT IS SOLAR THERMAL TECHNOLOGY?

Solar thermal technologies capture heat energy from the sun and use it to pre-heat water and air for homes, businesses, and industrial uses, such as crop and process drying. Solar thermal technologies can help residential, commercial and industrial buildings become more energy efficient, helping consumers and businesses save money, reduce greenhouse gas emissions, and support California manufacturing and installation jobs.

The potential for rooftop solar thermal technologies to reduce California's greenhouse gas emissions and natural gas use is especially great. California homes and businesses use 2.5 billion therms of natural gas annually simply for heating water (1). That is comparable to 3% of total statewide greenhouse gas emissions, and equal to the total storage capacity of natural gas in the state, including Aliso Canyon (2).

WHO USES SOLAR THERMAL?



Residential

The California Energy Commission estimates that 42% of residential natural gas usage is for water heating. Solar thermal can reduce a significant portion of this natural gas use—50% to 80% for an average residential solar heating systems.



Commercial

Many school, community and commercial pools are heated with natural gas. Solar can do most of that work by efficiently capturing the sun's heat. Hospitals, hotels, restaurants, and laundry facilities are also good commercial applications for solar thermal technologies.

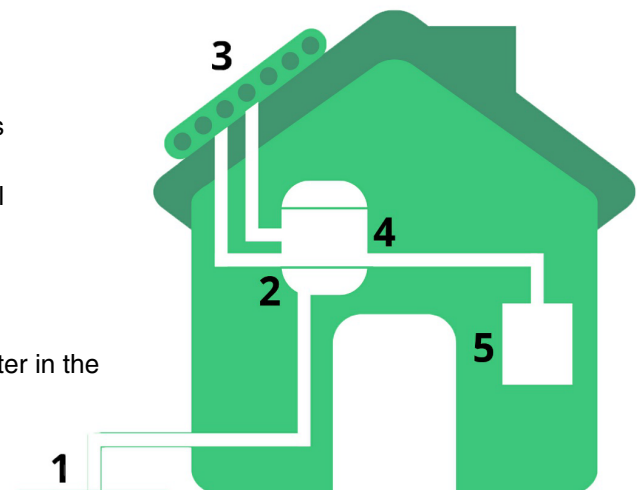


Industrial

Solar heating is used in large industrial applications, such as crop and process drying. When combined with chillers, solar heating can also provide air conditioning. The LA Valley College installed the largest solar thermal air conditioner in the U.S., in 2009.

HOW DOES SOLAR THERMAL WORK?

1. Cold water is drawn into the cylinder from the mains
2. Fluid is then transported to the rooftop solar thermal panels/collectors
3. Solar energy then heats the fluid
4. The heat from the fluid is then transferred to the water in the cylinder, which is then used in the home
5. A boiler can be used to heat water on cloudy days



CALIFORNIA-BASED SOLAR THERMAL MANUFACTURING

California is home to eight solar thermal manufacturers (collectors, components and packaged systems) across the state:

- ACR Solar International Corp. – Carmichael, CA
- FAFCO – Chico, CA
- Gull Industries – San Jose, CA
- Heliodyne, Inc. – Richmond, CA
- Morley Manufacturing, Inc. – Grass Valley, CA
- SolAqua, Inc. – Palm Springs, CA
- SunEarth – Fontana, CA
- Suntrek Industries, Inc – Irvine, CA



Sources:

1. California Air Resources Board, "Climate Change Scoping Plans Appendices," available at http://www.arb.ca.gov/cc/scopingplan/document/appendices_volume1.pdf
2. Using a conversion factor of 0.005302 metric tons CO₂ eq/therm from U.S. EPA, "Calculations and References," downloaded from www.epa.gov/cleanenergy/energy-resources/refs.html, and 2014 total CA greenhouse gas emissions of 441.5 million metric tons of CO₂ eq, <http://www.arb.ca.gov/cc/inventory/data/data.htm>;
https://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/undrgrnd_storage.html
3. Department of Energy, <http://energy.gov/energysaver/estimating-cost-and-energy-efficiency-solar-water-heater>.