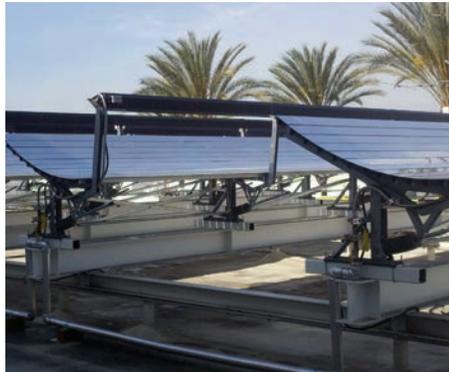


Solar Thermal Combined Heat and Power Project at the Energy Resource Center



The solar thermal system at SoCalGas includes two types of concentrated solar collectors. One is a parabolic trough and the other uses Fresnel lenses and incorporates concentrated photovoltaics that produce electricity (cogeneration). The system also contains a hot water storage tank, an absorption chiller and a condensing hot water heater.

SOLAR PILOT PROJECT

In early 2008, Southern California Gas Company (SoCalGas®) launched a showcase pilot demonstration project for a solar thermal hot water system that could provide chilled water, hot water and electricity for SoCalGas' Energy Resource Center (ERC) in Downey, CA. The system uses water heated by the sun to provide the energy needed. The system can simultaneously provide chilled water for space cooling from a hot water-activated absorption chiller and hot water for either domestic use or space heating. The building's energy management system (EMS) controls how the hot water is used, which is determined by the specific needs of the building at any point in time.

The system consists of two types of concentrated solar collectors that produce hot water. One is a parabolic trough and the other uses Fresnel lenses and incorporates concentrated photovoltaics to produce electricity in a cogeneration configuration. Both collector types track the sun on a single axis automatically. The electricity produced is delivered directly to the electrical distribution system of the building while the hot water produced is stored in a hot water storage tank. The storage tank is connected to a high-efficiency back-up hot water heater so that the system

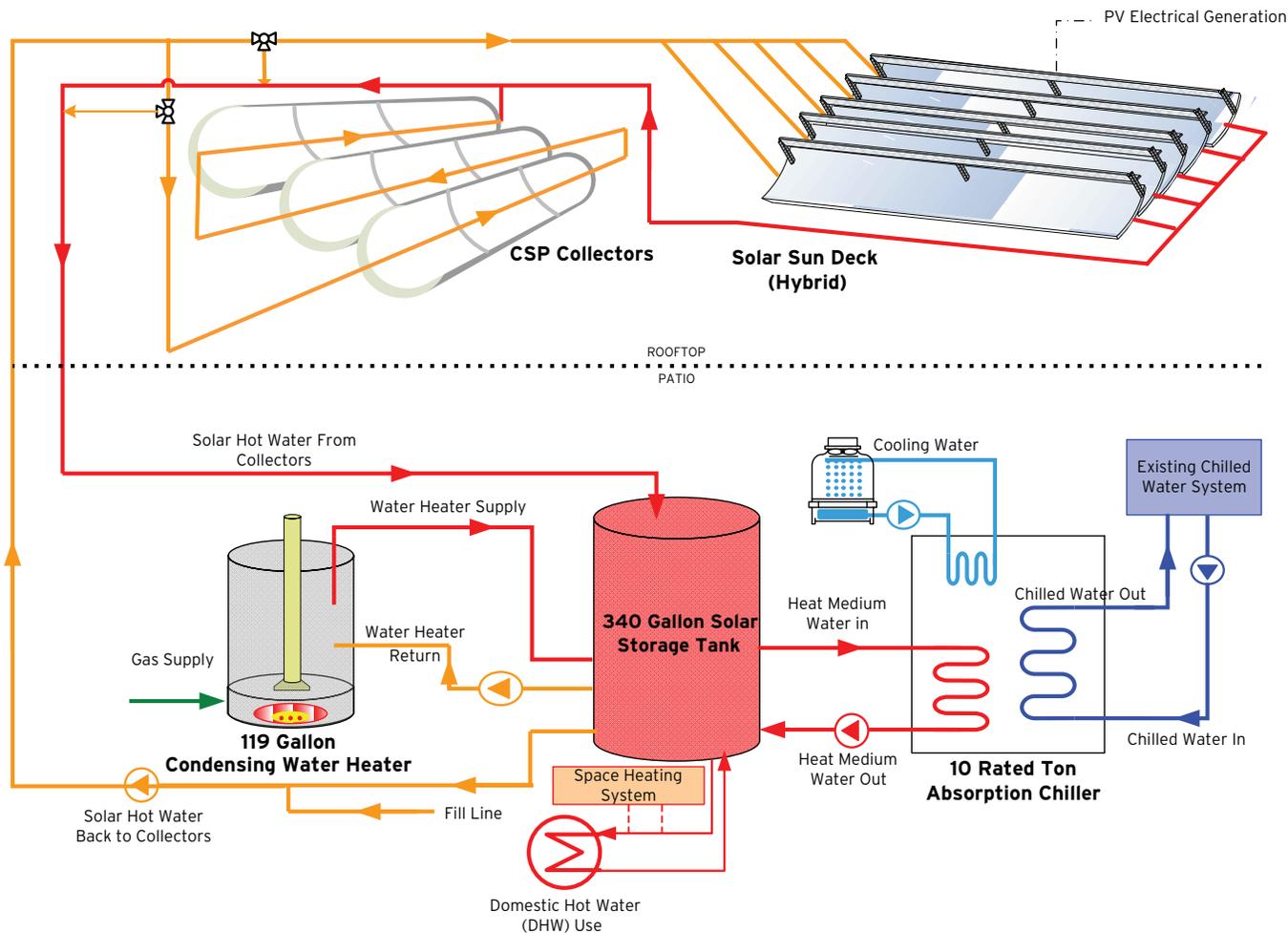
can be operated in the absence of sunlight. The storage tank also serves as a distribution point for the hot water to be used for domestic hot water, space heating and/or cooling. When in cooling mode, hot water is pumped to an absorption chiller that generates 10 tons of chilled water as a base load for the building's air conditioning system.

The system's cogeneration collectors incorporate concentrated photovoltaics to produce 0.5 kw (1706 Btu/hr) of electricity and 2 kw (6824 Btu/hr) of thermal heat per module simultaneously. They operate most efficiently at water temperatures between 150 - 165° F (65 - 74° C). The combined efficiency of the thermal and electric energy produced is far greater than any photovoltaic or concentrated photovoltaic panel and equivalent or greater than thermal-only collectors in the same temperature range.

The parabolic collectors, measuring 5 feet by 12 feet, are small enough to be used for non-utility-scale solar projects and are capable of generating hot water temperatures of up to 325° F (165° C), although the system at the ERC operates at approximately 190° F (88° C) when in cooling mode. Each module is capable of producing approximately 2.9 kw (9,949 Btu/h) of thermal heat.

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SOCALGAS ERC SOLAR COOLING & HEATING DEMONSTRATION PROJECT



The solar-thermal system at SoCalGas consists of two types of concentrated solar collectors (parabolic trough and Fresnel lens), a general storage tank, an absorption chiller, a condensing water heater and another storage tank fitted with heat exchanger coils used for domestic hot water and space heating.

To find out how your company's product or technology could be showcased by Southern California Gas Company, please contact Dale Fontanez at dfontanez@semprautilities.com.

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