

Turning Arizona's dry heat into a comfy chill

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The Solar Thermal Array installed on top of the UA's recreation center (in the background) has an estimated annual production equivalent of almost 2 million kilowatt-hours and is expected to reduce greenhouse gas emissions by 1,317 metric tons per year. It is the latest addition in a portfolio of innovations promoting energy efficiency and sustainability on the UA campus. (Photo: Ameresco Southwest)

An innovative solar-thermal heating and cooling system installed on top of the UA's Student Recreation Center is expected to harvest almost 200 million kilowatt hours of solar energy per year – enough to power more than 180 households.

In a nationwide first, an innovative system recently installed on the University of Arizona campus uses the sun's energy not only for heating but also for cooling.

At the heart of the solar thermal cooling and pool heating system is an

array of 346 argon-filled vacuum tube solar thermal collectors installed on the roof of the UA's Student Recreation Center.

The collectors utilize [heat](#) from the sun as a free energy source to drive an absorption chilling system to help keep buildings on campus cool while also heating the recreation center's main swimming pool.

An absorption chiller works similarly to a refrigerator or an air conditioner, except it uses a process relying on heat, rather than electric power.

“A water-glycol mix heated by the sun is pumped through the absorption cooler to produce chilled water that is fed into the University's main chilled water loop to provide cooling for campus buildings,” said Ralph Banks, assistant director for engineering at the UA's Planning, Design and Construction Office and manager of the UA's Solar Initiative Project.

“A byproduct of the absorption process is excess heat, which is subsequently used to heat the recreation center's main pool,” Banks said.

According to Banks, heating a large swimming pool, like the recreation center's main pool, requires large amounts of energy for much of the year. The Solar Thermal Array provides a third of the energy needed to heat the pool and offsets the use of natural gas heating.

“The benefit lies in utilizing [solar energy](#) in two ways: heating the pool and cooling buildings on campus,” Banks said. “To our knowledge, no other university campus in the U.S. uses solar energy in this unique application.”

Through its partnership with Ameresco Southwest, formerly known as APS [Energy](#) Services, and Tucson Electric Power, the University is

advancing solar technology awareness and education on [campus](#) and the community.

Provided by University of Arizona

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