THE UNIVERSITY OF ARIZONA

Facilities Management

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RE: AASHE STARS Innovation Credit

Dear AASHE STARS Program Staff:

This letter is being submitted in support of the University of Arizona's STARS documentation for an innovation credit. At the University of Arizona, cooling is crucial. In a city where summertime temperatures linger for half the year, an inefficient air-conditioning system is more than a money-guzzler—it's an unnecessary drain on limited water and energy resources.

So the university turned to ice. Throughout the evening and early morning hours, water is frozen and stored in central refrigeration plants. During the day, as temperatures rise and air conditioners fire up, the chilled water is circulated through buildings across the main campus and at the Arizona Health Sciences Center. The process moves the bulk of the UA's electrical load from the hot daytime hours to the cooler nighttime hours, when cooling requires less energy. By using the stored "thermal" energy of ice to cool the buildings during the daytime peak-usage periods, the system decreases daytime electrical consumption and dependence on fossil fuel-produced electricity.

The bulk of the ice-making occurs in 165 eight-foot-tall tanks in the campus's Central Refrigeration Building. These tanks, along with another 49 tanks in the main campus Central Heating and Refrigeration Plant, can produce more than 900 tons of ice per hour, which, once melted, reaches buildings across campus through an intricately managed network of chillers, cooling towers, pumps and underground pipes that connect the campus.

Estimated energy savings are $40,000 per month, with annual savings reaching $480,000.

In addition to these financial incentives, ice storage also provided the unique ability to increase cooling capacity while improving the overall efficiency of the plant—in other words, less input for a cooler output. The water is cooled at a highly efficient rating of 0.683 kilowatts per ton. In comparison, a home air conditioner generates energy at about 1.5 kilowatts per ton.

The thermal ice storage project, connected to the largest chilled water loop system in the world, attracts the attention of engineers and building managers from around the globe, many of whom come to Tucson to tour the UA's facilities. The unique system is also used to teach engineering students at the university about chilled water technology and other heating and cooling processes.

Besides making triple-digit temperatures bearable, air conditioning is a necessity in many research facilities and medical centers across the UA campus. The innovative solution to keeping the university cool has had significant and immediate effects on both the university's carbon emissions as well as its bottom line financials.

Sincerely,

Christopher Kopach
Assistant Vice President, Facilities Management