

# THE SUN FINDS ITS WAY TO SAN JOSE

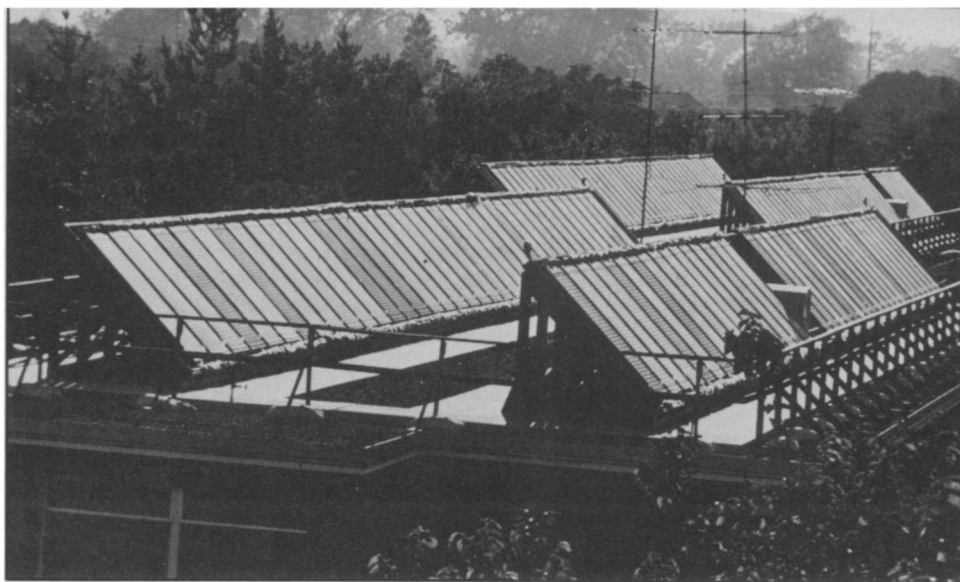
BY DIETRICK E. THOMSEN

Solar energy conversion is the one modern power supply technology in which small units appear feasible. Economics may dictate large plants when the heat source is conventional boilers or nuclear reactors, but, along with sunlight collectors half the size of Arizona, solar units small enough to power not more than a single house are a serious feature of most solar-energy proposals. This wide variation of scale makes a variety of local and individual initiative possible in solar conversion. It's not necessary to draw up plans for a multimewatt interconnection to start.

An example of such a local initiative is San Jose State University in California, which is engaged in a 15-year program to apply solar energy to various uses on its campus. By the end of that time the university expects to get between 30 and 50 percent of its total energy requirements from sunlight collected on the campus, Donald W. Aitken, director of the University's Center for Solar Energy Applications, told the American Physical Society Meeting in San Francisco.

The San Jose team started the project in 1975 by taking a campus map and coloring in yellow the places where solar energy might be applicable. They were surprised at how yellow the map became. They ordered the ensuing projects in a logical sequence. One of the first to be done was what Aitken calls the largest solar hot water system yet built in the United States. It provides 70 percent of the hot water needs of 600 students in three dormitories. Like most successful solar energy systems it can rely on other sources of energy for backup when the sun is overcast. The 70 percent is a "weather hazard" figure, Aitken says. "On a sunny day, we don't use any gas." When he spoke, northern California had just been through an extended rainy period, during which solar energy did very little. "But, if you notice that the sun came out in earnest yesterday and a little bit the day before, ... yesterday afternoon we were delivering 140° water."

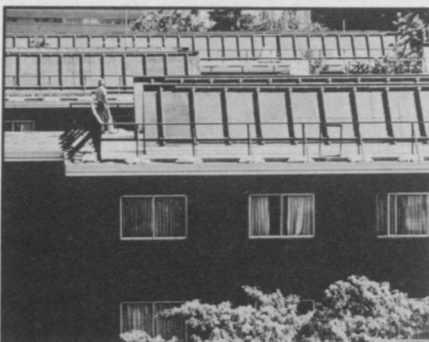
The 9,000-square-foot-system is laid out on top of the three buildings it serves. It was built with \$180,000 of state funds. "We have yet to write a research proposal,"



*Students installed collecting panels and tanks for solar-powered hot water system on roofs of dormitories at San Jose State.*



Alan D. Kipphut



Aitken says. "If we're really going to argue that solar energy is an available, practical resource, we've got to put our own dollars where our mouths are." The system was built by students, illustrating both the pedagogical value of the program and the talent available in the student body for pursuing solar-energy conversion.

The program envisions starting at least one major project a year. The next one in line is a new library. The library is designed to use the heat of human bodies and artificial lighting for space heat. When the days are too hot, the coolness of the night will be used to cool the building in the day. For times when bodies and lights do not suffice, the south wall of the building will incorporate a solar energy system for backup heating. This system adds \$600,000 or \$700,000 to a \$10-million building, and is expected to pay itself back in five or six years. Aitken maintains that nowhere in the San Francisco Bay area should new construction have to rely on burning fossil fuels for space heating or climate control generally.

After the library will come the conversion of the dining commons, which feeds 2,500 students a day. First, the wasted heat from over the stoves and from the dishwashers will be harnessed for space heating. So much heat is lost from stoves and dishwashers, says Aitken, that if it can be used, no restaurant need rely on any other source for heat. Then a solar unit to heat water for the dishwashers will be added. After the dining commons, the student union will get the treatment. Each project is different. Each takes into account the activities that go on in a given building and the advantages that can be drawn therefrom.

None of the existing or immediately planned installations generates electricity, but the later stages of the program will include generation of 400,000 watts in electric power along with 2 million watts thermal plugged into the university's central boiler. Aitken insists that conversion projects of this kind are feasible not only in San Jose, which has a mild climate and lots of sunny weather, but in any part of the country "including Seattle, Washington, and Maine." □

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