Park Marina Building

Energy storage shifts cooling load, saves energy • Redding, California

The new Park Marina building, housing the Social Security Administration, needed efficient, sustainable HVAC systems. The Imperial Group development company teamed with architect Nichols Melburg & Rossetto, Redding Electric Utility (REU), Trane, Ice Energy and Timberline Heating and Air to install eleven Ice Bear® energy storage units, each coupled with a Trane high-efficiency Precedent™ rooftop air conditioner.

The energy storage system helps to reduce ratepayer costs by shifting the air conditioning load to nighttime when energy costs are less and the compressors run more efficiently.

The single-story Park Marina Building, at 2660 Park Marina Drive along the Sacramento River, comprises 21,000 square feet. In addition to the energy storage system, the building features a white, heat-reflecting roof and foot-thick, insulated concrete walls for maximum energy efficiency. Left, Paul Hauser, Director for REU, stands near the Trane rooftop air conditioning units and the Ice Bear energy storage units installed on the roof of the Park Marina building. Projects like this serve the community's electric needs safely and reliably at very competitive energy rates.

Ice-Ready™ Trane rooftop units and Ice Bear® energy storage units cut electric costs and demand.

Systems & services

- 11 Trane Precedent™ rooftop air conditioning units
- 11 Ice Energy Ice Bear energy storage units

Challenge

Developer Imperial Group and Architect Nichols Melburg & Rossetto wanted to design the most comfortable and energy-efficient building possible when they built the single-story, 21,000 square-foot Craftsman-style Park Marina Building. Summers in Redding, about 225 miles north of San Francisco, are long, hot and dry.

Solution

Redding Electric Utility (REU), Trane, Ice Energy and Timberline Heating and Air recommended using highly-efficient HVAC units that, combined with Ice Energy's distributed energy storage units, make possible load-shifting strategies for even more energy savings. The air-conditioning system includes Trane high-efficiency Precedent™ rooftop air conditioners coupled with Ice Energy's Ice Bear™ energy storage units. What makes this a winning solution is not only the inherent efficiency, but with energy storage the air conditioning load can be shifted to nighttime hours when electricity is not only less expensive, but cleaner to generate. The Ice Bear units generate ice in their integral tanks during nighttime hours when the cost to produce electricity in Redding is less than daytime hours. Also, the compressors operate more efficiently during cooler nighttime hours.

The Ice Bear energy storage units operate in two modes: Ice Cooling and Ice Charging. During ice charging, the Ice Bear units each freeze about 450 gallons of water. When fully frozen, the Ice Bear condensing units shut off and the ice is stored until its cooling energy is needed. As daytime temperatures rise, the power consumption of air conditioning rises along with it, increasing peak demand. During this peak window, typically from noon to 6:00 p.m., the Ice Bear unit switches to Ice Cooling mode, replacing the energy intensive compressors in the air conditioning units. The Ice Bear units slowly melt the ice to provide building air conditioning. A small, high-efficiency pump pushes ice-cold R-410a refrigerant through an Ice-Coil™ installed in each Trane unit. The stored ice lasts for at least six hours. When fully melted, building air conditioning is again provided by the Trane air conditioning units. During cool nighttime hours, the Ice Charge mode is activated and the cycle begins again.

Results

Greg Tropsa, co-founder and Executive Vice President of Ice Energy, said, "The Ice Bear program with REU is a win for everyone--consumers enjoy air conditioned comfort, REU meets its state-mandated goals to reduce peak demand, the utility's overall cost of service is reduced, and the energy storage devices play an important role in reducing California's greenhouse gas emissions. It's a great example of how to stimulate the local economy, create jobs, and reduce environmental impact."

TRANE

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