**Viking Cold Solutions™ Delivers Green, Cost-Effective Solar Thermal Energy Storage Solution to Help San Diego Food Bank Reduce Grid Energy Consumption by 95%**

Thermal Energy Storage (TES) is an effective energy savings strategy that allows excess thermal energy to be collected and stored for later use—most typically when electrical utility demand charges are at their daily peak. TES systems have been in use for decades, mainly to lower energy costs and ease grid demand for air conditioning applications.

Players in other energy intensive applications such as refrigeration and cold food storage are now investigating the potential of TES as a means of moving away from an inflexible U.S. electrical grid system and toward a low-carbon energy generation future.

The Jacobs & Cushman San Diego Food Bank was looking for just such a sustainable and low-cost energy solution. The food bank is the largest hunger-relief organization in San Diego County and serves an average of 400,000 people per month. Feeding this many people requires a lot of food—some 22 million pounds per year—that must be safely stored and refrigerated, with minimal waste and at the lowest energy cost possible.

**The Challenge:**

The food bank needed a TES solution that would reduce spoilage in the warehouse and ensure that more food ends up on the plates of the people who so desperately need it. At the same, the storage solution would have to lower refrigeration costs, which might comprise up to 60% of the food bank’s energy consumption. The solution would also incorporate renewable resources to reduce the reliance on the electrical grid and help move the food bank towards achieving its long-term, sustainable energy efficiency initiatives.

**The Solution:**

Viking Cold Solutions, an energy storage specialist committed tomaking the world’s cold storage systems more efficient, was approached to implement a TES solution for the San Diego Food Bank.

The Viking Cold team provided its turnkey energy-management solution that combines TES with a rooftop solar photovoltaic (PV) system. The TES part of the storage solution consist of Viking Cold cells, each filled with a non-toxic, proprietary phase change material (PCM) custom formulated for the food bank’s specific cooling capacity needs.

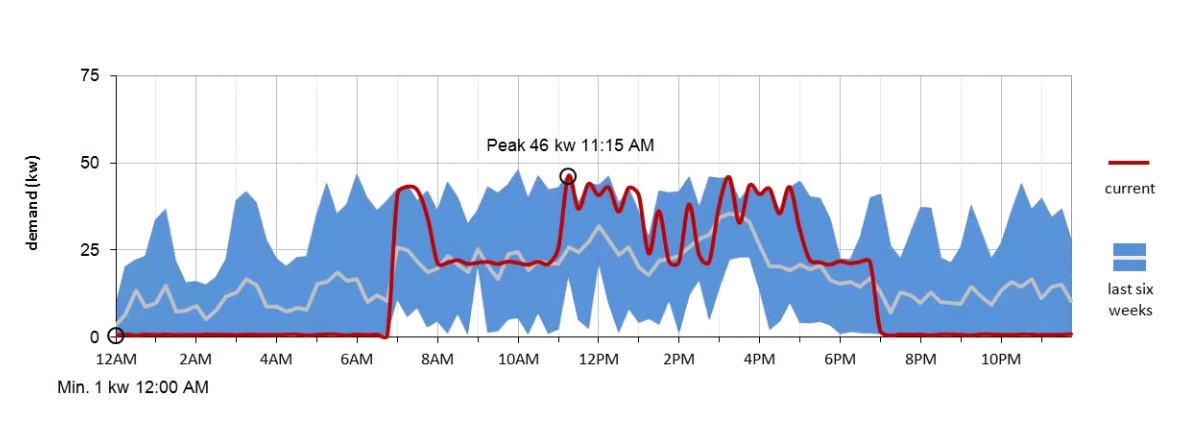
The cells are arranged in modules that easily install above the upper shelves of the food bank’s storage racks. The PCM freezes when the solar-powered chillers are running. The chillers can later be turned off and the TES solution takes over. As warmer air rises in the warehouse, the PCM adsorbs the heat and begins to melt, keeping the warehouse within its target storage temperature.

Rooftop solar and Viking Cold’s TES solution are a perfect combination which provides a number of operational advantages:

* **Increase the value of solar PV –** Solar is a low-cost and sustainable energy generation resource, but its intermittent nature does not allow for around-the-clock refrigeration. When PV energy is not available, such as during night-time hours, the TES system releases the stored energy to provide refrigeration with little or no reliance on the electric grid.
* **Cost-effective and built to last** – Rooftop PV and TES are both low-cost and designed to last for at least 20 years, with minimal maintenance or downtime.
* **Lower peak demand charges** – The system allows for peak load shedding or shifting at any time of day, which increases savings during periods of renewable variability.
* **Reduced operational risk -** Thermal backup allows customers to maintain safe temperatures and food quality during power outages or equipment failure, reducing business interruption and perishable food losses.
* **Comprehensive measurement, reporting and predictive tools –** The solution’s monitoring and reporting system uses energy consumption and temperature data to generate alarms which prompt immediate action should refrigeration issues arise. This same data may be used as a predictive tool to help customers prevent minor equipment problems turning into more expensive ones.

**The Payoff:**

By relying on solar PV during the day and the TES system at night, the San Diego Food Bank achieved net zero energy usage and independence from the electric grid for their refrigeration and cold storage needs. Additionally, the San Diego Food Bank gained thermal backup protection and increased temperature stability, while reducing its carbon footprint and providing a number of cost savings that benefitted its mission.



**With Viking Cold’s Solar TES system, the food bank’s nighttime consumption dropped 95%**

**Reducing electricity use**. Instead of having to rely on the electric grid after the sun went down, the TES system provided sufficient cooling capacity to dramatically drop grid consumption. Between the hours of 7 pm to 7 am, grid consumption dropped from 168 KWh to 8.1 KWh, a 95% reduction. And peak demand from refrigeration dropped from a high of 46 kW at midday to 1 kW overnight.

**Translating energy savings into more meals.** The money saved on electricity costs can be put to effective use in feeding more people. The San Diego Food Bank estimates that the savings will allow it to provide an additional one hundred thousand meals to hungry San Diegans over the life of the system.

**Improved grid stability.**  If more cold storage and supermarkets implemented this solution on a large scale, it would benefit utilities by providing a “buffer” of efficient and green on-demand energy storage at customer sites. This would serve to stabilize the load on the electric grid and help achieve local mandatory energy storage targets.

This system is among 24 built and installed by Viking Cold Solutions in cold storage warehouses and grocery stores in Bermuda, Puerto Rico, St. Thomas, California, New Mexico and Texas.

*Viking Cold Solutions™ is an energy storage company focused on making the world’s cold storage systems more efficient. Its Thermal Energy Storage Systems have saved their clients over 5900 MWh of energy and have removed over 4000 metric tons of Carbon from the air and mitigated over $13M of product loss. Its team has deep expertise in cold storage energy management, supermarket energy management, and thermal energy storage systems.*

*Viking Cold provides turnkey energy-management solutions that reduce operational costs and business risk for cold storage and supermarkets with high refrigeration-based energy loads. The company is expanding rapidly throughout the U.S. and internationally. Learn more at vikingcold.com.*