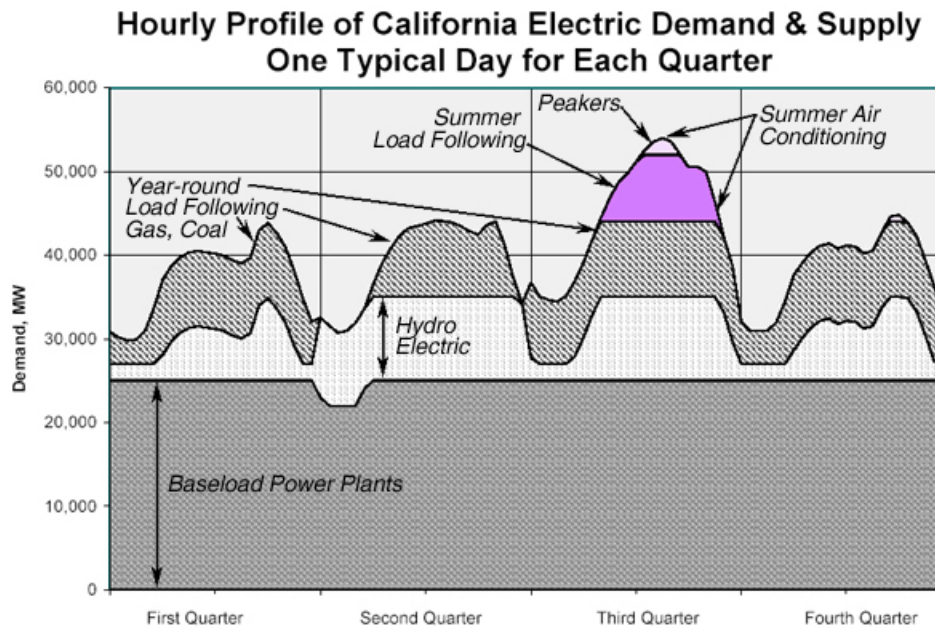




Analysis of City of Anaheim Ice Bear installation – Fire Station No.8

Summary

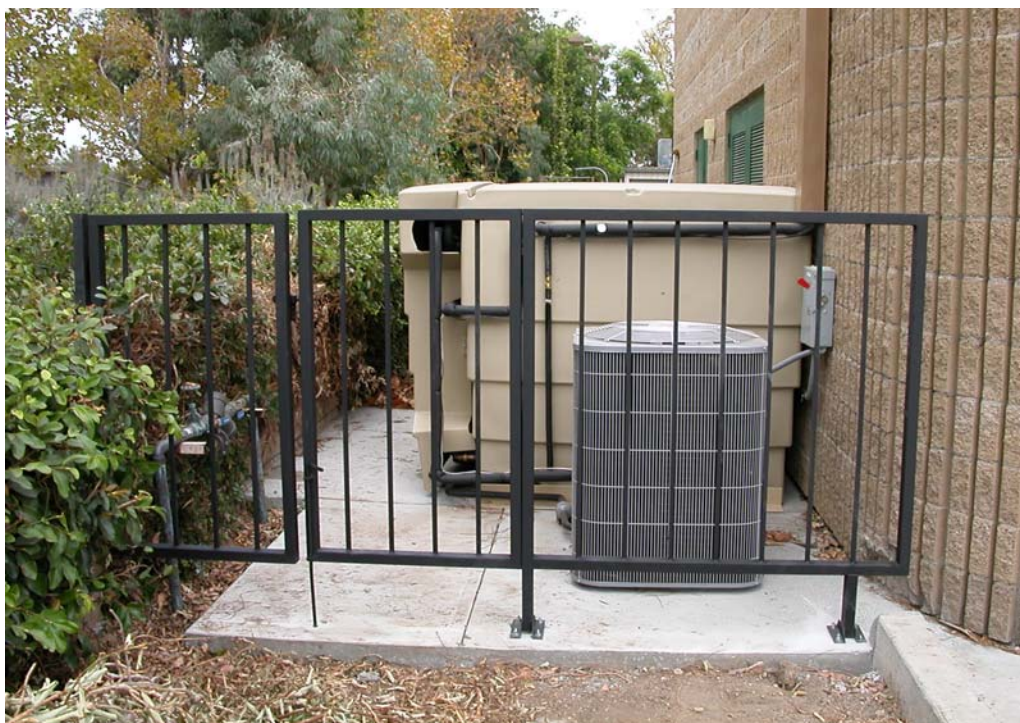
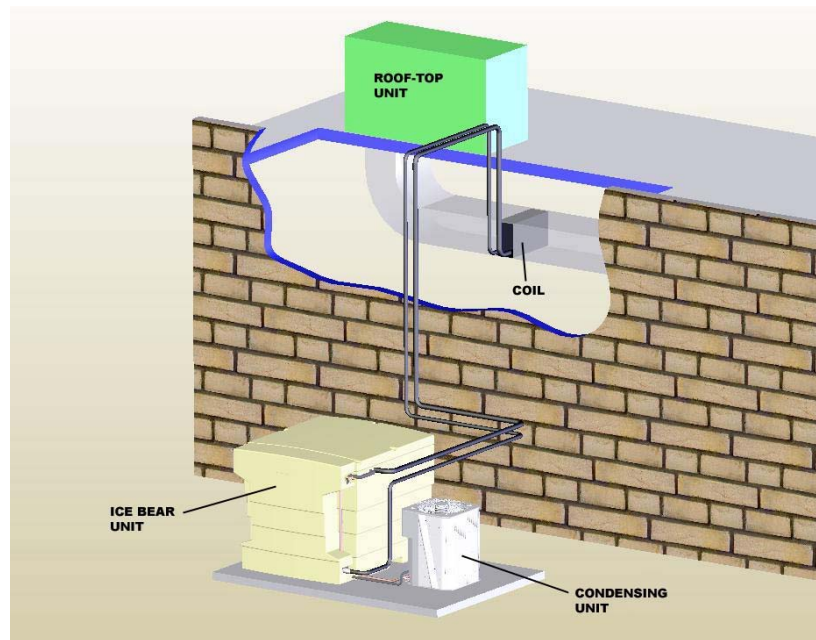
Anaheim Public Utilities is a municipal water and electric agency that purchased one Ice Bear for testing and benchmarking. The Ice Bear delivers public benefits as a cost-effective, demand-side, peak-load management device. The high watermark of peak electricity demand is set by the use of residential and commercial air conditioners. On a 90-degree day, Anaheim's peak demand is approximately 525 MW, which decreases to 260 MW during off-peak hours. The demand profile for California is shown in the following chart.



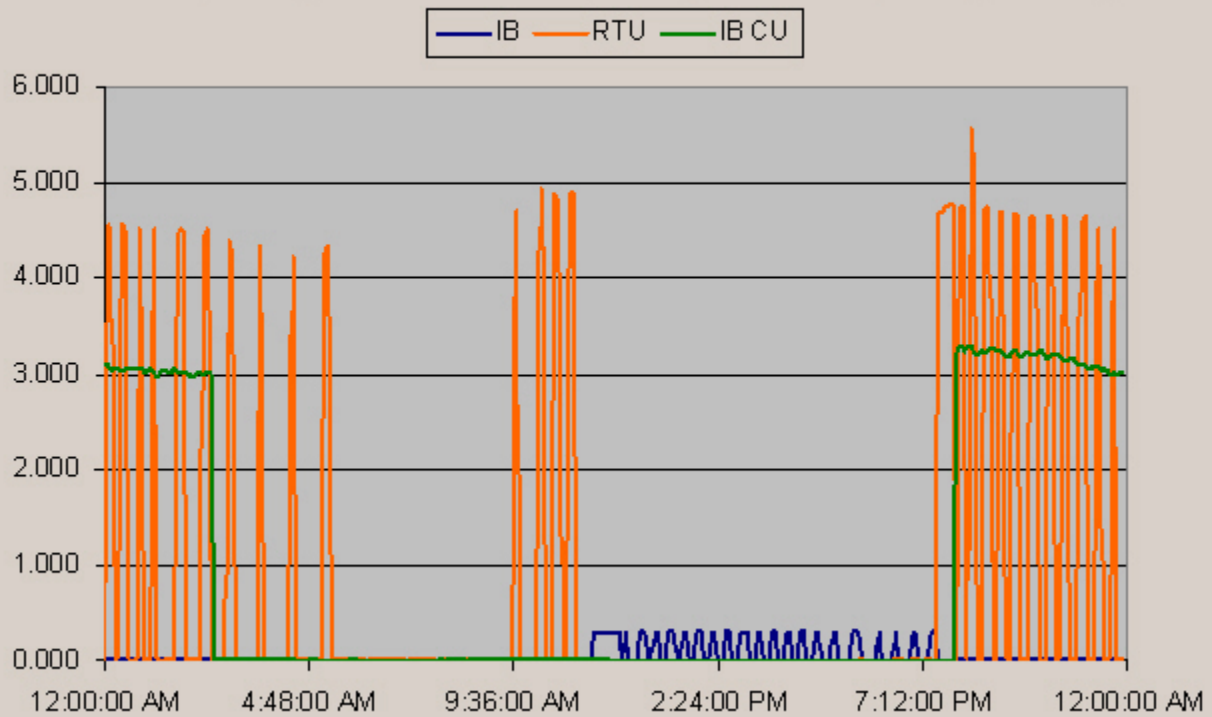
Widespread deployment of energy storage improves summer air quality by reducing the need to run Peakers. Peaking power plants typically have the highest rate of fuel consumption and highest rate of air pollution per kilowatt generated. Shifting the consumption of electrical energy from load-following plants to base-load plants further reduces air pollution and improves power plant source energy efficiency from 36% to 43%. This fact is explained in a study by the California Energy Commission entitled “Source Energy Impacts of Thermal Energy Storage” (P500-95-005 CEC) and is based on the Incremental Energy Calculation method for the Southern California Edison service territory.

Based on the initial test results, the installation of just 1,500 Ice Bears would reduce summer on-peak electrical demand by 10 MW and reduce source energy consumption by roughly 28%. Air emission reductions are slightly higher than source energy savings for an approximate 32% reduction in air emissions.

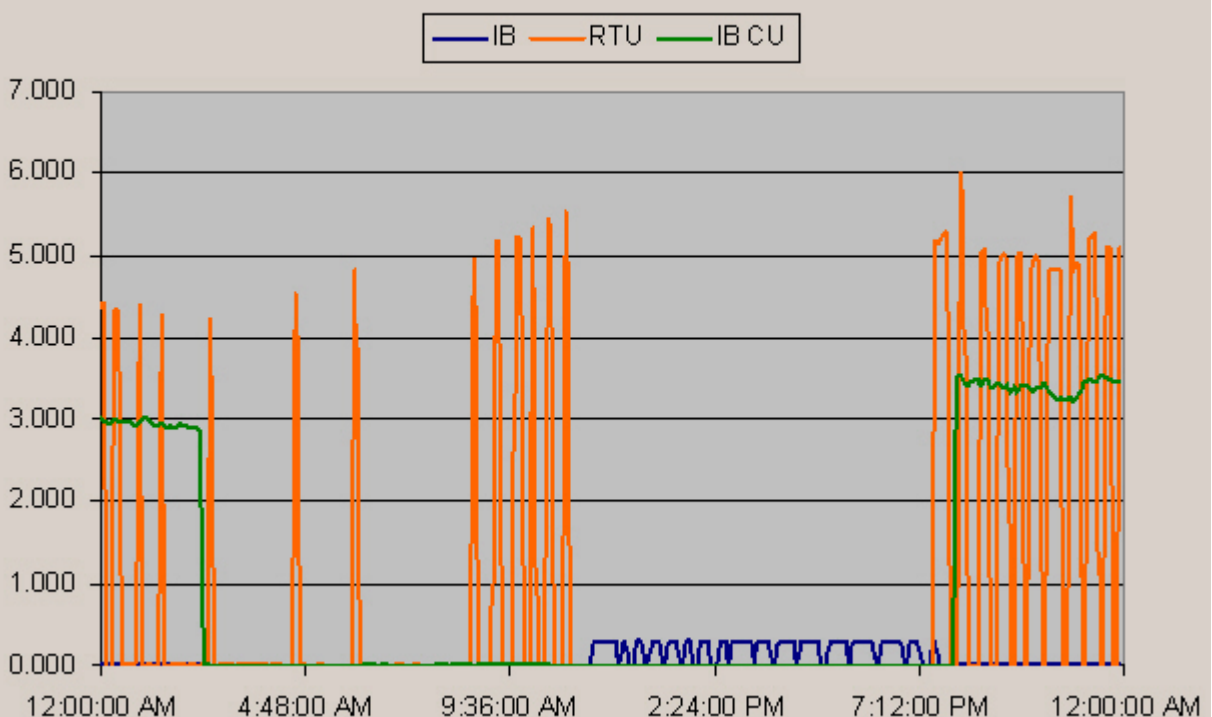
The Anaheim Fire Station Ice Bear was installed and commissioned in less than three days and went into service on Sept. 9, 2004. The Ice Bear is set to eliminate on-peak electrical demand between the hours of 11:30 a.m.-8 p.m. The Ice Bear delivers cooling through a 5-ton evaporator coil that was installed in the existing air supply duct beneath an existing 5-ton rooftop unit (RTU). The existing RTU delivers cooling during the off-peak hours. The Ice Bear installation includes a data monitoring and acquisition system to verify performance. The existing RTU generated a maximum on-peak compressor demand of 7 kW. The Ice Bear generates a maximum on-peak demand of 300 watts; roughly a 95% reduction in on-peak demand. On a sample day, the total off-peak energy consumed to make ice was slightly less than what the RTU would have consumed had it operated during the peak part of the day. So, the Ice Bear reduced the on-peak RTU air conditioning demand by 95% and also saved some energy.



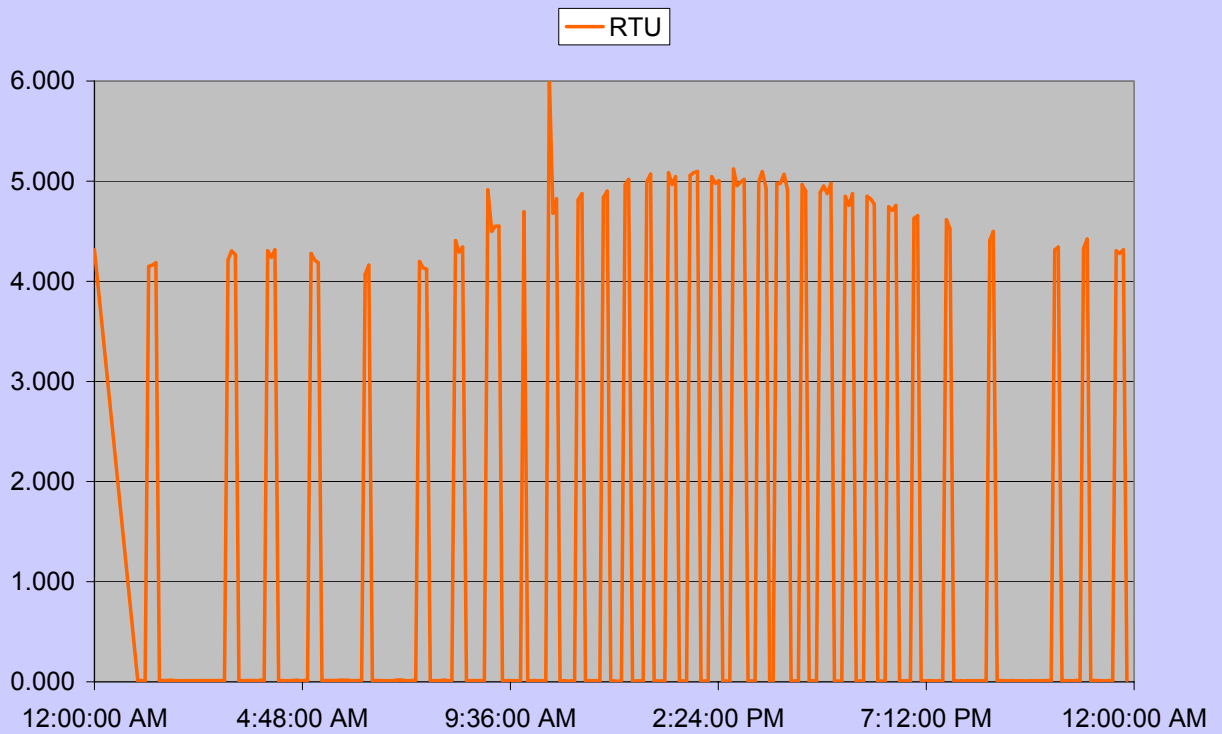
Sample Day After Ice Bear (98 Degree Rooftop Temperature)



Sample Day After Ice Bear (102 Degree Rooftop Temperature)



Before Ice Bear, Normal Day (80 Roof Top)



Before Ice Bear, Hot Day (110 Roof Top)

