

State Department Case Study:

San Francisco Civic Center Facility

Background

- Type of Facility: Department of General Services State office building
- Location: San Francisco
- Size: 2,100 employees, 1.1 million square feet
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Summary

In June 2000, the San Francisco Civic Center's peak KW (PKW) was 3,200 KW. Between June 2000 and June 2001, the facility implemented conservation improvements amounting to 501 KW reductions in lighting, HVAC and plug-in loads. In addition to those conservation improvements, the peak load reduction (PLR) plan in Stage 2 or 3 identified an opportunity for 88 KW additional curtailments for a total 589-PKW reduction by June 2001.

Referenced in Best Practice Guide:

- #12, "Reduce Energy Use in State Facilities Through Conservation Measures"

Plan

San Francisco Civic Center (SFCC) engineers collected peak load and average daily load data from paper logs. The data showed that the building used a lot of energy and that usage could be cut while maintaining a safe and comfortable environment. An energy services company (ESCO), Invensys, was hired to make preliminary recommendations for energy conservation opportunities.

SFCC engineering staff was responsible for planning and implementing energy conservation projects. The building manager and chief engineer oversaw the projects.

The energy conservation program targeted the building's energy management system and lighting and heating/cooling systems, as well as the hours of operation for heating, ventilating and air conditioning (HVAC) and lighting.

Programs: Conservation

✓ **Lighting:**

- Turned off lights when rooms not in use.
- Turned off overhead lighting and used task lighting at all times, and turned off hall (core) lights except for lights run by emergency power.
- Turned off outside "wall-washer" decorative lighting and left on only the minimum needed for safety and security.

✓ **HVAC:**

- Used an EMS to maintain interior air temperature set point at 68 degrees F in the winter and 78 degrees F in the summer. Courtrooms were maintained at a lower temperature since judges could not take off coats, ties or robes.
- Planned to apply solar block window film to all windows to prevent solar heat entry during the summer.
- Used HVAC economizers to affect optimum duty cycle and/or other measures to optimize compressor startups in all HVAC systems. The building maintenance staff took this action via the EMS control monitor.
- Maintained HVAC operation while reducing it to minimum levels for safety and health by shutting off fans at 4 p.m., which had little effect on building occupants. Air conditioning was shut off during the weekends at all times.
- Lowered air duct pressure by 0.2 inches to reduce the load on air supply fans.

✓ **Computer/office equipment:**

- Turned off monitors when staff was away from their desk.
- Installed nearly 1,000 Watt Stoppers to set all video monitors and computers to power down after five minutes of non-operation.

✓ **Building plug-in loads:**

- Unplugged or disconnected drinking fountains with water coolers at all times.
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- Installed occupancy sensors on vending machines to regulate the use of energy in plug-in equipment.

✓ **Work schedules:** SFCC building manager implemented the “team cleaning” procedure at night. Cleaning took place on four floors at a time, while lighting on 10 floors was shut down.

✓ **Employees:** SFCC staff posted “Lights out? Computer off?” signage near some elevators to remind employees about turning off equipment at the end of the day.

Programs: Efficiency

✓ **EMS:** A new EMS system was being installed at a cost of \$200,000, using building bond funds. No efficiency data was available yet.

Budget and Finance

For non-ESCo projects (\$200,000 EBI; \$100,000 miscellaneous energy measures, such as conservation measures listed above; \$200,000 window film), SFCC received from the Joint Powers Authority a \$500,000 bond funded by unused building construction funds. The Joint Powers Authority controls building construction bond expenditures.

SFCC also used monies from the yearly O&E budget and ESCo sources (energy bond). The building manager administered the funds.

Results

San Francisco Civic Center could not analyze the cost/benefit of individual projects because its EMS system did not have monitoring/metering capabilities; it could only measure the total energy use of the building. In June 2000, SFCC’s total peak kilowatt load was 3,200 PKW. In June 2001, total PKW load was approximately 2,600 during normal operations and electrical emergencies. Between June 2000 and June 2001 the building realized:

- 501 KW reductions in lighting, HVAC and plug-in loads
- 88 KW in additional curtailments during Stage 2 and 3 electrical emergencies
- A total 589 PKW reduction.

Lessons Learned

San Francisco Civic Center learned that the contract process for the energy-bond-funded ESCo projects was very slow. The Public Works Board, which approves state capital-improvement projects, took more than a year to consider SFCC’s proposed projects.