

Summer Initiative Project Summary

Dedicated to preservation of the Presidio and conservation of natural resources, the Presidio Trust has developed comprehensive programs to eliminate waste, save water and conserve energy. In July 2000, the California Public Utilities Commission (CPUC) offered financing through Decision 00-07-017 which sought to achieve significant demand and energy reductions by summer 2001. The Presidio applied through the local utility, Pacific Gas and Electric (PG&E) for funding from the CPUC "Summer Initiative".

Identifying opportunities to save hundreds of thousands of kW/hrs each year, the Presidio Trust formulated a plan for retrofitting both residential and non-residential buildings with energy efficient lighting, controls and energy management systems. Project planning and management, implementation and installation, data collection and evaluation were all factored in to the funding request and the Presidio Trust was awarded up to \$500,000 to implement the Presidio Summer Initiative Program.

Energy Savings

According to the final report for the project, the total energy savings is 1,104,682 kilowatt/hours saved annually. This amounts to a 163-kilowatt savings during peak demand.

Measure	Units	# of Units	Peak Impact (kW)	Annual Savings (kWh)
Commercial				
LED Exit Signs	Fixture	150	4.7	40,734
Pulse Metal Halide	Lamp	9	0.3	1,888
Compact Fluorescent	Lamp	127	4.0	24,075
T8- Lighting	Fixture	2,525	145.4	752,358
Lighting Controls	Each	203	8.64	2,808
Energy Management Systems	Each	47	0	0
Residential				
Compact Fluorescent	Lamp	7,689	0	219,701
T8- Lighting	Fixture	1,081	0	32,684
Astronomical Street Light Timers	Fixture	193	0	30,434

Cost Savings

By pursuing an alternative financing solution, the Presidio Trust avoided \$500,000 in costs that would have been needed to accomplish this comprehensive retrofit program. The annual energy savings as reported above results in significant avoided costs. Energy costs at the Presidio range from \$0.092 to \$0.163 per kWh, depending on the time of day and season of the year. By achieving energy-savings in excess of a million kilowatt-hours per year, the Presidio has reduced annual operating costs by approximately \$165,000.

Environmental Benefits

According to the U.S. Environmental Protection Agency (EPA), "the United States pumps more carbon dioxide into the atmosphere than any other country in the world. Each of us contributes about 22 tons of carbon dioxide emissions per year, whereas the world average per capita is about 6 tons. Although CO₂, CH₄, and N₂O occur naturally in the atmosphere, their atmospheric concentrations have been affected by human activities. Since pre-industrial time (i.e., since about 1750), concentrations of these greenhouse gases have increased by 28, 145, and 13 percent, respectively (IPCC 1996). This build-up has altered the composition of the earth's atmosphere, and affects the global climate system."

The Presidio Summer Initiative focused on reducing energy consumption in the residential and commercial sectors of the Presidio community. According to the EPA, these sectors together account for over 30% of the energy used in the United States each year.

End-Use Sector	1990		1995	1996
Industrial	1,636.0		1,709.5	1,766.0
Transportation	1,474.4		1,581.8	1,621.2
Residential	930.7		988.7	1,047.5
Commercial	760.8		797.2	828.2
U.S. Territories	33.7		44.0	40.1
Total	4,835.7		5,121.3	5,303.0

Table ES-8: (From US EPA Website)
CO2 Emissions from Fossil Fuel Combustion by
End-Use Sector

The EPA states, “the residential and commercial sectors accounted for 19 and 16 percent, respectively, of CO2 emissions from fossil fuel consumption in 1999. Both sectors relied heavily on electricity for meeting energy needs, with 66 and 74 percent, respectively, of their emissions attributable to electricity consumption for lighting, heating, cooling, and operating appliances. The remaining emissions were largely due to the consumption of natural gas and petroleum, primarily for meeting heating and cooking needs.” With very little industrial activity in the Presidio, the majority of impact that can be made on energy consumption is through the residential, commercial and transportation sectors. The Presidio Summer Initiative project focussed on the residential and commercial sectors of the community.

By implementing lighting retrofits in residential and non-residential buildings, the Presidio is reducing the use of energy and the resulting emissions of carbon dioxide—a major contributor to global warming—and other atmospheric gases that trap the heat of the Earth. According to Pacific Gas and Electric, we can calculate the amount of CO2 going into the atmosphere each year (as a result of electrical use) with the following equation: (# Of kilowatts X 1.5 = pounds of CO2) According to this calculation, by reducing energy use by 1,104,682 kWh each year, the Presidio is eliminating 1,657,023 pounds (or over 825 tons) of CO2 from the atmosphere.

Awareness and Outreach Activities

An extensive outreach campaign was part of the Summer Initiative program. The Presidio Trust Sustainability Department assisted with outreach to the residential and non-residential sectors. As part of the program, residents in the community received educational information about energy conservation prior to the retrofit of lighting in their home. Some residents participated in audits that examined their energy-use habits and thus received a greater detail of outreach. Educational materials that were produced included memos to both residential and non-residential tenants and graphic switch-plate covers, designed to remind occupants to turn lights off when not in use. The Presidio also participates in a Rebuild America partnership that focuses on raising awareness in the community with regard to energy conservation. In 2001, the Presidio hosted four on-site special events designed to raise awareness about energy issues.

Spring 2001	June 5, 2001	August 16, 2001	August 30, 2001
ENERGY FAIR	ENERGY CHALLENGE	WATT CAN I DO?	ALERT WORKSHOP
Local Earth Day Event. Shared information about energy conservation and Presidio-specific efforts with local community.	Rebuild Presidio event for tenants. Offered the opportunity for tenants to learn about conservation practices and technologies from for Rebuild Business	Rebuild Presidio program with Crissy Field Environmental Education Center. Program targeted residents and local community	Presidio hosted this DOE event. Live Webcast of the results from the DOE ALERT program. Included speakers, case-study

	Partners. Had opportunities for building audits and troubleshooting.	members to learn about energy savings in the home.	presentations, displays and a Presidio tour.
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Creative or Innovative Aspects

Designated as a National Historic Landmark, the Presidio must be managed in compliance with historic guidelines. At times, the historic parameters appear at odds with our conservation goals. It is the unique charge of the Presidio Trust to balance our historic preservation goals with our environmental sustainability goals. The Presidio strives to be a site where solutions to these potential conflicts can be discovered.

On the Presidio Summer Initiative project, we ran into numerous situations where research was necessary to retrofit fixtures in a manner that maintained their historic character while updating the technology for energy efficiency. One example is building 1802, the Army’s Engineering and Maintenance Shop, built in the 1920’s. This building, adapted for present use by a publishing firm was equipped with 300-watt incandescent bulbs housed in a historic fixture. The lighting levels were poor and the lights required frequent maintenance due to low life expectancy of the bulbs. They were not only inefficient, but also expensive to maintain as they required frequent replacement and were located directly above the printing equipment.

Research revealed this to be a perfect application to try induction lamp technology. A custom retrofit kit was required to utilize the existing historic fixtures. Additionally, the fabrication of specialized connection boxes was necessary to tie the new equipment together with the old. The result is a well-lit building in which energy savings amount to over 1,800 kWh/year. The new lamp is 85 watts and has a rated life of 100,000 hours or 22 years. The savings in maintenance alone will be worth the effort.

Transferability of Technology

This project has excellent transferability. The lighting retrofits done at the Presidio were accomplished with off-the-shelf technology and in-house labor. Lessons learned can be readily shared with other agencies. Geographic lessons like the lack of emphasis on air conditioning due to San Francisco’s mild climate are significant to local entities. The decision to drop high intensity discharge fixture control modules from the retrofit plan may be a learning experience of use to others. We found that these modules do not provide as much savings as initially estimated and can decrease the life of the bulb. Through the national Centers of Environmental Innovation program, the Presidio has committed to share case studies and lessons learned with other National Parks and federal agencies on our website through newsletters, educational programs and interpretive signage.

Integration/Thoroughness

The Presidio Trust has made an overall commitment to energy efficiency and conservation. The Presidio Summer Initiative project has been integrated into an overall sustainability and energy conservation program at the Presidio Trust. Retrofitting buildings with energy efficient technology is just one way that energy resources are saved at the Presidio. Over the last three years the Presidio Trust has converted a majority of the vehicle fleet to alternative fuel vehicles. Twelve trucks and eight cars run on electricity. The Presidio has an on-site, quick-fill compressed natural gas (CNG) fueling station and 75% of the fleet is comprised of CNG bi-fuel vehicles. Five dedicated CNG shuttles serve the visiting public and biking, hiking and walking is encouraged through the development of trails and infrastructure. Natural lighting and ventilation is maximized in building rehabilitation and Energy Star boilers and appliances are used in residences. Together, all of these efforts helped realize an overall 20% reduction in energy use in 2001.

** A third party consulting firm Equipoise Consulting Inc. oversaw the evaluation of this program.*