

Title: FAMSF Departmental Climate Action Plan

Data Year: Fiscal Year 2010-2011

Author: Al Barna

Date: March 25, 2011

Contents

1. Introduction 1

2. Departmental Profile 1

3. Departmental Carbon Footprint 2

4. Other Sustainable Practices 3

5. Community Wide Impact 6

Appendices Attached Separately

1. Introduction

To the best of our ability, we confirmed that all of the data is accurate as shown in the FAMSF Google Docs.

Summary of Carbon Footprint

The Fine Arts Museums' carbon footprint includes the consumption of energy (electricity, natural gas) in both our facilities and the liquid fuels from our fleet and diesel generators. For FY10/11, our CO2e consumption and emissions are verified from the data:

Emission Source	Consumption	CO2e Emissions (metric tons)
Electricity (kWh)	13,237,489.00	195.45
Natural Gas (Therms)	497,925.00	2,648.76
Liquid Fuel (Gals)	979.49	8.45
Totals		2,852.70

Overarching Climate Action Plan Goals and Implementation Plan

Our goal is to maintain our commitment to reducing CO2e emissions whenever possible while protecting the museums' collections.

2. Departmental Profile

Departmental Mission

The mission of the Fine Arts Museums of San Francisco (the deYoung Museum and the Legion of Honor) is to provide, through the development and utilization of the collections, exhibitions, education, and community outreach programs, a rich and diversified experience of art and culture for the Bay Area, Northern California, and national and international audiences.

Departmental Budget

FY10/11 Base			FY10/11 Base Proposed			FY10/11 FINAL		
Legion	deYoung	Total	Legion	deYoung	Total	Legion	deYoung	Total
5,403,656	5,689,466	11,093,122	5,446,587	5,854,127	11,300,714	5,248,388	5654089	10902477

Number of Employees

The Museums currently lists 450 active employees.

The Fine Arts Museums of San Francisco (FAMSF) workforce comprises (a) employees of the Corporation of the Fine Arts Museums (COFAM) and (b) employees of the City and County of San Francisco.

Departmental Facilities (location and approximate size)

The Department's facilities are comprised of the following business locations:

deYoung Museum
50 Hagiwara Tea Garden Drive
Golden Gate Park
San Francisco, CA 94118
292,500 sq. ft.

Legion of Honor
100 34th Avenue
Lincoln Park
San Francisco, CA 94121
117,665 sq. ft.

Existing Environmental Goals

FAMSF strives to provide a high quality cultural experience for visitors and a safe and healthy workplace for employees with minimal impact on the natural environment in Golden Gate Park and the City and County of San Francisco.

Fleet Inventory

1. 2005 International Freightliner M2 (leased)	621-600
2. 2009 Dodge Sprinter	621-601
3. 2000 Ford Windstar	621-501

Departmental Climate Action Plan Contact

The Fine Arts Museums Climate Action Plan contact is:

Al Barna
Safety Officer
Phone: 415-750-7631
Email: abarna@famsf.org

3. Departmental Carbon Footprint

Energy Use and Emissions Information

The facility list for the Fine Arts Museum in Google Docs has been verified.

The Museums annual energy use (electrical and natural gas)¹ and resulting greenhouse gas emissions² for 2010/11 are listed below:

Emission Source	Consumption	CO2e Emissions (metric tons)
Electricity (kWh)	13,237,489.00	195.45
Natural Gas (Therms)	497,925.00	2,648.76

In an effort to increase our energy efficiency and conservation, the museums have been installing the V-Mod HVAC/UVGI maintenance tool. A typical installation of the V-Mod can potentially pay for itself in less than one year through energy and maintenance savings. When installed, the lamp destroys contaminants in the HVAC system, including molds and bacteria and maintains the system to virtually original specifications making it an extremely versatile UV-C system. The system delivers better energy savings through improved system efficiency. This system produces no ozone, gases, or other noxious fumes, and eliminates the need for chemical coil cleaning treatments. This project was started in the final quarter of 2010 and will continue into the next fiscal year. To date, six air handling units (AHU) have been retrofitted with UVDI systems.

We have also upgraded the beverage vending machines in the staff lounge at both facility locations. The new machines exceed Tier 2 Energy Star ratings and have LED lighting as well as the latest and most efficient refrigeration unit. Other options include programmable lighting and an after-hours feature that shuts the machine down when not in use.

We do not have any current renewable energy installations within our facilities.

3a. Facilities – Energy & Water Use, & Reduction Measures

Emission Source	Consumption	CO2e Emissions (metric tons)
Water	11,558,096.00	0

Our water efficiency and conservation program is under development. All plumbing fixtures in the deYoung Museum are equipped with water saving motion sensors.

3b. Fleet – Fuel Use & Reduction Measures

	Consumption	Cost	CO2 (tonnes)
Gasoline (Gals)	800.30	\$2,271.84	7.05
B20 (Gals)	365.7	\$1,177.29	3.66
--B100 (Gals)	73.14		0.69
--Diesel (Gals)	292.56		2.97
LPG (Gals)	0	\$0.00	0
CNG (GGE)	0	\$0.00	0
Totals:	1531.7	\$3,449.13	10.7120314

We replaced two large vehicles (a van and a truck) with one newer, more fuel-efficient vehicle (Dodge Sprinter).

4. Other Sustainable Practices

Sustainable Design at the deYoung Museum

The new deYoung Museum provides ideal conditions for viewing the collection and is also an example of sustainable design. Sustainable design combines energy and resource use in both the construction and operation of a building as well as indoor air quality and pollution reduction.

The roof form with the long canopy on the west side shades the walls and glazing from direct solar radiation, which significantly reduces the cooling load on the building. The materials used in the exterior walls provide sufficient insulation.

The primary function of the air-conditioning systems is to preserve the collection and to provide comfortable conditions for viewing. The systems are designed to be energy efficient. Supply air is introduced at floor level, which takes advantage of stratification in the gallery spaces to reduce cooling loads and provide stable internal conditions. This system also reduces the total fan-pressure, which reduces electrical consumption by the fans. This low-level supply system uses a higher temperature for supply air than the conventional ceiling supply system, which in the mild climate of Golden Gate Park results in reduced demand for mechanical cooling.

The chillers, the central source of cooling for the building, are very efficient and use a refrigerant that does not deplete the Ozone Layer.

Direct sunlight into gallery spaces is undesirable, however, diffuse daylight in gallery spaces not only reduces electrical energy use it provides a better quality of light for viewing artwork. Daylight is introduced to the gallery spaces in two ways. Vertical shaded glass lets in diffused daylight from the main courtyard and the south facing façade above the main entrance. Skylights with light baffles and reflectors introduce controlled daylight into gallery rooms on the upper floor. The glass used is a high performance type that lets in visible light yet cuts out a large percentage of the solar gain.

Much of the copper used for the building façade was recycled copper. Copper is 100% recyclable.

The wood used in floors, ceilings and art cases is from sustainable growth forests in Australia.

Fly ash (a fine, glass-like powder recovered from gases created by coal-fired electric power generation) was used in the concrete, thus using a material that would otherwise go into landfills.

More than 85% of the materials from the demolition of the old deYoung and Asian Art Museum were recycled. This included more than 13,000 tons of concrete, 108 tons of asphalt, 40 tons of steel, and 50 tons of steel reinforcing bars from the concrete.

The rainwater runoff from the roof goes into recharge chambers under the Sculpture Garden rather than going into the city sewers.

Energy Conservation and Efficiency Measures

HVAC: FAMSF is using the economizer operation on 13 of 14 total Air Handling Units (AHU) that supply our facilities. The AHU's condition air in four ways: heat, cool, dehumidify, and humidify. The AHU then distributes the preconditioned air to the zones for tempering as needed to maintain zone set points. The AHU's condition the air in two ways; mechanically, or through economized control. Mechanical cooling is done through chiller plants. There are three chiller plant types utilized in FAMSF facilities designed to minimize energy consumption for fluctuating demands: helicals, adaptive frequency drive centrifugals, and an air cooled system two-stage screw type compressors.

Building Automation System (BAS): These systems are incorporated into all main equipment within the facilities. The BAS monitors, balances, and controls the interactions between equipment and climate settings. The system dictates operation and sets parameters from which all equipment functions. The BAS fine-tunes temperature and humidity control to various zones in the museums using Proportional Integral Derivative (PID) calculations that balance and maintain climate. With zone climates maintained, the systems as a whole see fewer energy spikes which lead to significant savings during peak demand hours.

Lighting: FAMSF uses two general lighting system control types to maintain efficiency and reduce energy consumption: dimming control, and lighting control relay systems (Wattstopper). The dimming control is integrated with Wattstopper at the FAMSF's largest facility, increasing the level of efficiency. Wattstopper automatically sheds gallery lighting after the museums close to reduce energy consumption. Exterior lights adjust automatically for sunset and sunrise throughout the year. Photocells turn off gallery backlit skylights at FAMSF's largest facility. Motion sensors turn off lights in workspaces when no motion is detected. Incandescent and fluorescent brightness can be dimmed in several areas of the museums, resulting in considerable energy savings.

4a. Zero Waste

In 1993, FAMSF implemented a Waste Minimization Program designed to identify waste minimization techniques, strategies, and resources available to reduce or eliminate the generation of hazardous waste. This program is in compliance mandated by the U.S. Congress Resource Conservation and Recovery Act (RCRA) in 1984.

In 2009, a recycling and composting program was implemented that is compliant with provisions established by the City and County of San Francisco. Recology services are provided by Sunset Scavenger.

Batteries, fluorescent tubes/bulbs, and hazardous chemicals are recycled in conjunction with the San Francisco Department of Public Health. Pickup and removal is scheduled on a quarterly basis.

A Hazardous Materials Unified Program Agency (HMUPA) Compliance Certificate is issued on an annual basis. Maintaining the certificate is contingent upon compliance with all provisions of Articles 21, 21A, 22, 24, and 30 of the San Francisco Health Code (SFHC).

In 1997, an Integrated Pest Management Program was created in accordance with the City of San Francisco's Pesticide Ordinance. The program is administered and monitored by an in-house IPM committee.

Paper Reduction

The following procedures have been implemented in an effort to reduce paper use:

- An electronic invoice scanning program called Paper Save
- 100% recycled paper for copy machines and printers
- e-mail and e-file
- hand towel waste composting
- Recycled wet umbrella bags
- Encourage double-sided document printing

Please see Appendix A: Waste Assessment Questionnaire

4b. Employee Commute

FAMSF provide bicycle racks for visitors and employees. Museum employees are eligible for enrollment in a pre-tax transit pass program designed by WAGE WORKS. FAMSF conducted a Fine Arts Museum Transportation Survey:

Survey dates:	11/29/2010 to 12/13/2010.
Response percentage	27.34%.
Survey Distribution	Online, no paper survey
Results	The survey showed that 44.57% of responders drive alone, while 20.22% of responders use public transit. The remaining responders walk, bicycle, and carpool

4c. Green Purchasing

Our Green Purchasing Score is 1.25.

4d. Information Technology

The FAMSF has completed a server consolidation project of rack mounted servers to either virtual servers or blade servers. Both types reduce power and AC needs.

Former Server Room:	4958 Watts/HR	16,200 BTU/HR
Consolidated Server Room:	3200 Watts/HR	700 BTU/HR

All monitors are set to power save mode after 20 minutes of inactivity.

5. Community Wide Impact

The Fine Arts Museums have presented a number of exhibitions that have examined environmental and sustainable issues with education, information, hands-on activities, and programs designed by the Museums Education Department.

Visitors who present a MUNI fast pass or valid transfer receive a \$2 discount off the standard museum admission price.