

Energy Consumption Discussion of Environmental Issues to be Considered When Determining Goals and Strategies - October 2005

The following is a summary of County energy usage over the past five years and the corresponding CO₂ emissions. CO₂ emissions are targeted for reduction by the Kyoto Treaty and by the Sustainable Silicon Valley Initiative because they contribute to global warming.

| YEAR | Electricity (kilowatt hours- kWhs) | | Natural Gas (therms) | | Gasoline (Gallons) | | Diesel (Gallons) | | TOTAL CO ₂ tons |
|---------|---|----------------------|-------------------------|----------------------|-----------------------|----------------------|----------------------|--------|-------------------------------|
| | CO ₂ tons | CO ₂ tons | CO ₂ tons | CO ₂ tons | CO ₂ tons | CO ₂ tons | CO ₂ tons | | |
| 1999/00 | 32,321,697 | 8278.13 | 1,581,676 | 9205.35 | 418,478 | 4107.36 | 89,187 | 938.69 | 22,529.53 |
| 2000/01 | 32,551,584 | 7695.23 | 1,516,534 | 8826.23 | 405,122 | 3976.27 | 79,320 | 834.84 | 21,332.57 |
| 2001/02 | 29,024,745 | 6861.48 | 1,473,476 | 8575.63 | 401,024 | 3936.05 | 85,838 | 903.44 | 20,276.60 |
| 2002/03 | 31,363,835 | 7414.44 | 1,456,020 | 8474.04 | 400,045 | 3926.44 | 82,682 | 870.23 | 20,685.15 |
| 2003/04 | 33,659,692 | 9423.03 | 1,529,406 | 8901.14 | 386,589 | 3794.37 | 76,665 | 806.90 | 22,925.44 |
| 2004/05 | 32,034,244 | 9954.64 | 1,522,083 | 8858.52 | 383,676 | 3765.78 | 71,839 | 756.11 | 23,335.05 |

(Note: The factors that convert natural gas therms and gasoline and diesel gallons to tons of CO₂ emission are constant. The conversion factor for kWhs to CO₂ tons varies from year to year depending on how clean the process is that generates the electricity.)

Electrical and natural gas usage is fairly consistent and the County has produced a fairly consistent amount of CO₂ emissions over the years. The County has been aggressive in implementing electrical and natural gas efficiency projects (lighting, heating and ventilation system retrofits and upgrades). However these savings have been reduced as the square footage of maintained facilities has increased by the reconstruction of the San Mateo County Medical Center and the Crime Lab, and the addition of the Long Term Care Facility in Burlingame.

The gasoline and diesel data reflects the amount of fuel dispensed from County pumps, which has been reduced in the six year time period. The average miles per gallon per vehicle has increased with the acquisition of 51 gas-electric hybrid vehicles for the County fleet.

There are other environmental issues related to energy consumption to consider when determining goals and strategies.

1. **The relationship between water and energy.** Water transportation, purification heating and wastewater treatment comprise one of the biggest energy uses in the state. Therefore, water conservation programs are also energy conservation programs. Energy conservation programs also reduce the need for water as the production of electricity and the cooling of energy plants require water.

2. **Air quality.** The generation of electricity that is used at County facilities may take place outside of the County and therefore the CO₂ emissions associated with electrical generation may also take place out of the County. However, the effects of the use of natural gas will have a local impact on air quality gas. Gasoline and diesel usage also affects local air quality. Other CO₂ reduction programs such as promoting commute alternatives improve air quality, but these programs are not covered in the above data.
3. **Environmental impacts of infrastructure.** San Mateo County and San Francisco are in a transmission-constrained area, meaning that there are limited transmission paths to move electricity up the peninsula. With the continuing increase in energy demands on the peninsula, more infrastructure will be needed. This has many environmental implications, including construction, environmental justice, and land use issues.
4. **Transportation of Fuel.** Emissions from gasoline and diesel use are caused by more than just driving. Impacts on air quality also occur from the transportation of fuel to the stations, storage in distribution centers, and the process of filling the underground tanks at gas stations. Increasing gas mileage per vehicle reduces all of these impacts.
5. **Global warming.** Whether or not the current federal administration considers global warming to be a concern, Sustainable Silicon Valley, the governor of California and Senator Feinstein understand the impacts of greenhouse gas emissions on the climate. Using CO₂ emissions as an overall measurement offers the County a more global perspective in weighing alternatives.

For instance, the installation of a co-generation system, which switches our energy use from electricity to natural gas, will save money and reduce electricity consumption by heating water that is used in the facility with the waste engine heat. However, the CO₂ emissions remain constant except for peak energy usage hours when our local utility depends on the dirtiest options for generating electricity to meet the demand. Installation of a solar array, on the other hand, eliminates CO₂ emissions for all electricity generated with the added benefit of producing the most electricity at peak demand times.