

San
Mateo
County
Energy
Strategy

2012

Prepared for the Cities and County Associated
Governments of San Mateo by the Utilities and
Sustainability Task Force

*Findings and
Recommendations*

TABLE OF CONTENTS

	page
Executive Summary.....	
1. Background.....	
... 2	
2. Context.....	
.... 6	
3. Findings.....	
.... 9	
4. Goals.....	
..... 17	
5. Strategies.....	
.... 20	
6. Recommended Actions.....	22
Bonus Section: Waste.....	42
Appendices	
A Utilities & Sustainability Task Force Members.....	45
B Status of City and County Efforts.....	47
C Collaboration & Communication Process.....	48
D Glossary.....	49
E Task Force Reports.....	51

F Resources.....

SECTION 1. BACKGROUND

In February 2006, the Congestion Management and Air Quality Committee¹ authorized the creation of an ad hoc energy working group to develop an energy strategy for San Mateo County. The group was chartered to consider the future energy needs of the county and recommend how to address the needs in an environmentally, socially and fiscally responsible manner. This resulting Energy Strategy focuses primarily on electricity use, but also covers natural gas use and water consumption as it relates to energy use. Forms of energy used for transportation are not in the scope of this report or the recommendations.

The working group was composed of six elected officials and six stakeholder representatives, and first met in June 2006. (Members are listed in Appendix A.) The group chose the name Utilities and Sustainability Task Force (USTF) in case it was later asked to address other utility or environmental issues after completing its initial work on the Energy Strategy.

The task force started by defining the the desired outcomes and guiding principles for the Energy Strategy.

Desired Outcomes

- Energy is consistently available and affordable for all residential, commercial and industrial users in San Mateo County.
- Energy will be consistently available and affordable for future generations of San Mateo County residents and businesses.
- The environmental impact of energy production is minimized to the greatest extent possible.
- Local officials are involved in PG&E's planning process regarding local production, transmission and distribution of energy, for both centralized and distributed generation.
- Policy makers and the public understand the impact of their actions, make wise energy choices and utilize existing and future energy efficiency programs.
- The linkage between water and energy use is understood and recognized.
- San Mateo County is a leader in providing solutions for energy efficiency and greenhouse gas reduction.

Guiding Principles

- San Mateo County communities will, to the greatest extent feasible, establish standards that are consistent within the county and across the Bay Area, and share

¹ CMAQ changed its name to the Congestion Management and Environmental Quality Committee (CMEQ).

programs and educational materials. Applicable actions from the California Energy Action Plan² will be included in the Energy Strategy.

- The Energy Strategy will leverage all existing and future federal, state, regional and public purpose (such as PG&E-administered) programs to the greatest extent feasible.
- Government agencies should lead by example in reducing energy and water use, enforcing regulations and educating citizens about energy issues.
- The City/County of San Francisco's energy use is inseparably linked to San Mateo County's use, so future strategies must be collaborative and consider the needs of both Counties.
- The process for developing the plan and recommendations is transparent and open.
- Quick and visible wins are important for building credibility and commitment. If solutions that are easy to implement are identified during the process, these can be recommended to CMEQ prior to the full report.
- Policies and programs should be designed to meet long-term goals.
- As set forth in the California Energy Action Plan II, conservation, efficiency, and demand management are the preferred ways to reduce energy use. Should new generation or infrastructure be required, it will be done with the least possible environmental impact.
- Energy solutions should support economic development and offer new job opportunities.
- Future land-use planning and development should include responsible energy decisions.
- Public education and awareness programs should promote responsible energy and other resource use by the public.
- Recommendations will take into account environmental justice impacts.
- Decisions will not increase greenhouse gases and will preferably contribute towards significant reductions.

Data-Gathering

The task force educated itself on a range of relevant topics, including historical and current energy use, energy forecasting methodology, the impact of peak power on infrastructure needs and the state's complex energy regulatory framework. The task force also learned about the relationship between energy and water and energy and climate change.

After reviewing the data, task force members realized that **if the historical trend continues, the county will use 22 percent more energy in 2027 than it does today**. Further, if San Mateo County's cities and water agencies fail to meet their current water conservation plans, total water demand in 2026 could be nearly 5 million gallons higher per day. Such significant growth in energy and water demands would require more energy infrastructure (e.g. power

² The California Energy Action Plan was first published in 2003 by the three state energy regulatory agencies and updated in 2005. It is discussed in Section 2, Context.

plants and transmission lines), consume a larger percentage of public and private budgets, and emit substantially more greenhouse gas emissions than will be allowable under AB32, the Global Warming Solutions Act of 2006.

Early on, the task force concluded that countywide energy efficiency and water conservation goals are appropriate and necessary to maintain the county's economy and quality of life. Task

Energy efficiency and water conservation goals are appropriate and necessary to maintain the county's economy and quality of life.

force members also endorsed goals supporting the local development and use of renewable energy and greenhouse gas emission reductions.

The group invited speakers to present information about the programs and resources offered to local governments to help them save energy and water. Data on actions taken by other Bay Area cities are doing was also provided.

After learning about energy efficiency services, financing options, green building policies and

water conservation programs, the task force members set targets for reduction.

The Energy Strategy recommends a countywide goal to reduce energy use by 25 percent below current levels by 2020. The Energy Strategy also recommends a goal to reduce projected water use by 10 percent by 2020 and 15 percent by 2030.

Report and Next Steps

Based on input from elected officials and staff from several jurisdictions, this final Energy Strategy report includes the following elements:

- Countywide goals and strategies
- Best management practices applicable to all communities
- Recommended measures for cities with certain characteristics
- Brief case studies
- Comprehensive list of resources

The task force now requests that CMEQ, C/CAG and all 21 jurisdictions in the county do the following:

- Pass a resolution accepting the findings, goals and strategies in this Energy Strategy Report
- Participate in the development of the countywide Energy Strategy Implementation Plan
- Begin taking action in their own communities

USTF members and staff hope that this Energy Strategy is useful to elected officials and staff in the cities and the County as well as to the business community, residential community and other parties interested in energy issues. Input and additional information are welcomed. Please send comments and suggestions to the County of San Mateo Resource Conservation Programs Manager at (650) 599-1412.

SECTION 2. CONTEXT

Role of Energy

Energy is the lifeblood of the modern age. As long as the lights are on and a hot shower available, most people don't worry about how energy is produced and delivered to their homes or businesses. Very few consider the impact of their actions on the energy supply, the economy, society or the environment.

Only when an outage occurs is it clear how much of one's daily existence depends on the electric grid and natural gas supply. The energy crisis of 2000-2001 demonstrated how vulnerable local governments, businesses and individuals are to energy price increases and supply disruptions.

In San Mateo County, the rotating black outages caused productivity losses in the billions.³ Soaring energy prices hit low-income families particularly hard and forced some small companies out of business. The experience serves as a reminder that **an affordable, reliable energy supply is vital to the continued quality of life and economic health of San Mateo County.**

An almost invisible cost of a reliable energy supply is the environmental impact of energy production and transmission facilities. San Mateo County has been lucky: there has never been a power plant within its borders. That will change when a new power plant opens at San Francisco International Airport.⁴ Although the new plant will use a natural gas turbine technology—the cleanest available for a fossil fuel plant—it will generate particulate pollution and greenhouse gases. It is expected to run 50 percent of the time.

The energy delivery infrastructure has a smaller impact on its surroundings than a power plant, but is still worth noting. Transmission lines carry high voltage electricity from power plants to substations. The lines interrupt open space and residential neighborhoods, disturb wildlife habitat and raise concerns about possible health effects. Substations use transformers to convert the high voltage into lower levels that can be sent across smaller distribution lines. They are usually (but not always) situated away from residential areas, surrounded by fences and posted with warning signs. They are unsightly and sometimes raise health concerns.

Because a single electric grid serves the entire region, the actions of one group affect everyone else. In San Mateo County, the average household in one of the four most affluent communities consumes between two and five times more energy than households in other cities. Although they pay higher utility bills, the energy habits of those residents require a larger energy infrastructure in the county than would otherwise be needed.

Framework

³ The biosciences, manufacturing and information technology industries are particularly vulnerable to power outages, often losing days or months of work. *The Bay Area - A Knowledge Economy Needs Power* (Bay Area Economic Forum, 2001), <http://www.bayeconfor.org/pdf/PowerBAEF.pdf>, p. 36-37.

⁴ The 49 megawatt facility is planned, but work has not begun and no opening date has been set.

Three agencies oversee California's energy system, with separate and interlocking duties. They are the:

- **California Independent System Operator (CAISO)** - operates and manages the overall transmission system, also known as the grid
- **California Public Utilities Commission (CPUC)** - regulates the local distribution system and approves rates
- **California Energy Commission (CEC)** - tracks historical use, forecasts future needs, sets energy efficiency standards, develops new technologies and provides rebates for renewable energy

The Governor appoints the board members for all three agencies. The Legislature enacts energy legislation which must be approved by the Governor.

PG&E is an Investor-Owned Utility (IOU) that owns and manages the transmission system in its Northern California territory and delivers electricity to end users. It forecasts the future energy needs for its territory and administers Public Goods Funds for public purpose programs. PG&E also owns and manages a natural gas distribution network and delivers natural gas to end users.

Some cities buy and deliver electricity and natural gas to their residents and local businesses. Palo Alto and Sacramento are both Municipal-Owned Utilities (MOUs). MOUs pay a fee to their local IOU to use the local transmission and distribution infrastructure. They set their own rates; fees usually go into the general fund. There are currently no MOUs in San Mateo County.

Policy

Following the energy crisis, the regulatory agencies developed an Energy Action Plan (EAP). Its goal was to ensure adequate, reliable and reasonably priced electricity and natural gas supplies through cost-effective and environmentally sound policies, strategies and actions. The EAP established a "loading order" to prioritize how the state should meet its increasing energy needs.⁵ The loading order calls for:

- **Energy efficiency:** using the minimum amount of energy necessary to effectively perform a task, such as using a compact fluorescent light instead of an incandescent bulb to light a room
- **Demand response:** discounted rates that encourage or require users to lower their energy use when demand is high and thus prevent power outages
- **Renewable energy:** the production of electricity from natural and renewable sources through the use of solar panels, wind turbines, hydroelectric dams, etc.
- **Distributed generation (DG):** decentralized, renewable energy sources that supplement energy produced from centralized power plants
- **Clean fossil fuel:** highly efficient natural gas facilities instead of coal-fired plants

⁵ The loading order affirmed in the 2005 EAP II, which outlines specific state actions per this ranking. http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF.

Results

California's strong regulatory framework and focus on energy efficiency have kept the state's per-capita energy use relatively flat over the past 30 years, compared to an average 45 percent increase in other states.

Its programs and policies (such as Title 24, requiring energy efficient buildings) have been widely copied throughout the country. Appendix F of this Energy Strategy provides information on many of the policies, technologies, programs and financial incentives available to local governments, businesses and consumers.

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SECTION 3. FINDINGS

The Energy Strategy was developed after extensive data-gathering and analysis. Sources included the Associated Bay Area Governments Energy Watch Partnership, the Bay Area Water Supply and Conservation Agency (BAWSCA), PG&E, state agencies, other Bay Area cities, local experts and innumerable web sites. Other regional energy plans and climate protection plans were consulted to identify best management practices.

Highlights of the task force's findings provide provide context for the Energy Strategy's recommended goals, strategies and actions. More detailed reports are found in Appendix C and on the USTF website, <http://www.ccag.ca.gov/ustf.html>.

Energy Demand

PG&E is responsible for forecasting future energy needs in its territory based on historical demand, anticipated population increases, expected job growth and numerous other factors. The forecasts are used to ensure that enough electricity and transmission capacity are available to meet expected demand and prevent outages.

PG&E estimates a one percent annual increase in overall electricity use for the Peninsula area (which includes San Mateo County) over the next five years.⁶ It may not sound like much, but that represents an additional 9.8 megawatts of energy use in the region every year, or approximately one new power plant every five years.

Peak demand is the biggest factor in planning how much energy infrastructure is needed. Demand for energy in the Bay Area generally peaks on weekday summer afternoons when most businesses use air conditioning. Power plants that are used only when needed to meet the increased demand are called peaker plants.

PG&E expects the Peninsula's peak demand to grow by 11 percent in the next decade. San Francisco also relies on transmission lines in San Mateo County; its peak demand is expected to increase by 12 percent.

If both counties continue to use more energy every year as expected, the environmental impact will be significant. The state will require PG&E to develop new power sources and add new transmission lines to prevent outages. Some portion of the increased demand may be offset by new solar electric and other alternative energy systems, but the remainder will likely come from natural gas power plants. As stated above, even the cleanest fossil fuel plants emit greenhouse gases and particulate pollution. Building new transmission lines is expensive, interrupts neighborhoods and open space and is generally unpopular with local residents.

Using more energy will also lead to higher energy bills. As energy prices continue to rise, the financial impact will be magnified. San Mateo County residents, businesses and governments may find themselves spending a very large portion of their budgets on utilities if PG&E's energy projections prove accurate.

[insert chart showing projected growth and prices, if data is available]

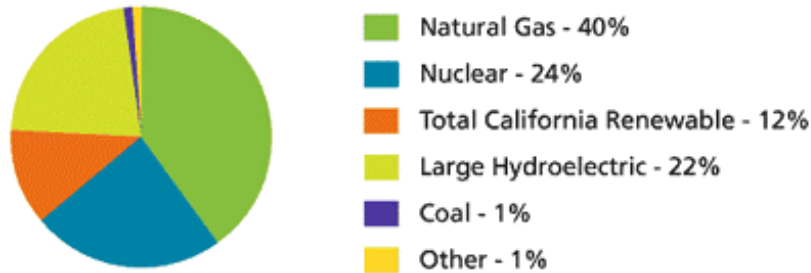
⁶ PG&E does not make publish its projections beyond a five-year period.

Energy Supply

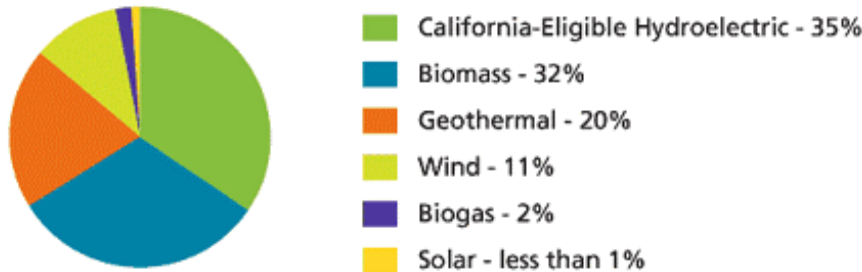
SOURCES

PG&E supplies electricity and natural gas to all of San Mateo County. The investor-owned utility owns 80 power plants and buys power from 400 other plants. Its energy mix is the cleanest in the country, with more than half of its energy derived from non-fossil fuel sources.

PG&E's 2006 Electric Power Mix Delivered to Retail Customers



PG&E's 2006 California-Eligible Renewable Resources



As defined in Senate Bill 1078, which created California's renewable portfolio standard, an eligible renewable resource includes: geothermal facilities, hydroelectric facilities with a capacity rating of 30 MW or less, biomass, selected municipal solid waste facilities, solar facilities, and wind facilities.

Source: http://www.pge.com/education_training/about_energy/how_electric_system_works/2006_energy_mix.html.

The state's Renewable Portfolio Standard requires utilities to obtain 20 percent of their energy portfolio from renewable sources by 2010.⁷

More than 13,000 customers in PG&E's territory now meet some or all of their energy needs through self-generation, where they buy or lease systems that produce energy on-site. Several kinds of self-generation systems are eligible for rebates, tax credits or other financial incentives to make them more affordable. Self-generation systems are usually more cost-

⁷ <http://www.energy.ca.gov/2007publications/CEC-300-2007-003/CEC-300-2007-003-CMF.PDF>, p. 1.

effective for users in the long-term. Depending on the financing model, they can save money in the short-term as well.

Self-generation systems also help the overall electric system by reducing the load on the grid and contributing energy when it is needed most, during peak periods. Solar electric systems frequently produce more energy in summer afternoons than the owner can use. As long as the system is connected to the grid (“grid-tied”), the extra energy can flow onto the grid and be used elsewhere.

“Net-metering” describes a user’s ability to store energy credits with the utility for later use. State legislation currently limits net-metering to a single account, meaning any energy credits produced at a site can only be used at the same site or meter. Some municipalities, including Davis and San Francisco, have successfully lobbied to be allowed to apply energy credits earned at one site to their accounts at other facilities. The Utilities and Sustainability Task Force is investigating how jurisdictions in San Mateo County might become eligible for similar treatment.

San Francisco, Marin and Oakland-Emeryville-Berkeley are investigating Community Choice Aggregation (CCA), under which a government entity buys energy and resells it to residents and businesses in its own community. The agency pays a fee to PG&E for use of its distribution infrastructure. Governments hope to use CCA as a mechanism to buy a preferred type of power (usually green or renewable) at a lower cost than is available through PG&E. Critics suggest that the promised benefits of CCA are difficult to secure.

DISTRIBUTION

PG&E owns the energy infrastructure within its territory, consisting of:

- High-voltage transmission lines
- Substations
- Primary and secondary distribution lines
- Transformers
- Switching equipment and
- Service lines

See **Diagram 1** for a picture of the system.

Energy and Climate Change

Public and media awareness about global warming grew exponentially during the development of the Energy Strategy. Although task force members chose to keep the focus of the Energy Strategy on energy and water as originally intended, they consciously selected goals, strategies and actions recommendations that will also help local governments combat global warming.

When energy is produced by burning fossil fuels such as natural gas, coal and petroleum, carbon dioxide and other greenhouse gases are released into the atmosphere. These gases trap solar rays inside the earth’s atmosphere, causing the temperature of the air, land and oceans

to rise.⁸ The slow but steady increase in the earth's temperature is referred to as global warming. The term "climate change" is used to indicate the impact of increased global temperatures on both short-term and long-term climate patterns across the world. The term "climate protection" describes measures taken to reduce the impact of human activity on global temperatures and the climate.

Reducing the demand for energy will lead to lower energy production and lower greenhouse gas emissions.

Reducing the demand for energy through energy efficiency, demand response, clean energy and distributed generation will lead to lower energy production. **Lower energy production, in turn, will lead to lower greenhouse gas emissions.**

In fall 2006, the Governor and California legislature passed landmark legislation mandating significant reductions in greenhouse gas emissions from "stationary sources" such as

power plants and petroleum refineries. Even though AB32, the Global Warming Solutions Act, starts by targeting specific industries, **local governments will soon be required to play an important role in helping the state meet its greenhouse gas reduction goals.** AB32 calls for a return to 1990 greenhouse gas levels by the year 2020, which represents a 25 percent drop from today's emission rates. Longer-term, the law calls for emissions to be reduced to 80 percent below 1990 levels by 2050.

The simplest, fastest and most cost-effective way to reduce harmful greenhouse gas emissions is to reduce the overall amount of energy used, and to use cleaner forms of energy. Decreasing the level of energy use throughout the county is a critical first step in reducing greenhouse gases and slowing the impact of climate change, as directed by the state.⁹

Energy and Water

A significant amount of energy is used in the county to pump, heat and treat water. Statewide, 19 percent of electricity and 32 percent of natural gas is used for water-related activities of supply, heating, transport and treatment.¹⁰ Because over 90 percent of San Mateo County's water comes from the ultra-clean and gravity-fed Hetch Hetchy regional water system, the impacts are lower than elsewhere in the state but still significant.

Statewide, 19% of electricity and 32% of natural gas is used for water-related activities of supply, heating, transport and treatment

Hot water is particularly energy-intensive, because energy is needed to transport, treat, heat and deliver it, as well as to transport and treat the resulting wastewater. **Using less water, especially hot water, saves a lot of energy.** Using renewable energy alternatives to heat water, like solar thermal and fuel cell systems, helps reduce the energy-intensity of the water used.

⁸ For a more detailed explanation of the impact of greenhouse gases on climate, see the Union of Concerned Scientists website, http://www.ucsusa.org/global_warming/science/emissions-of-heattrapping-gases-and-aerosols.html.

⁹ For more information on the state's extensive climate change activities, visit the California Climate Change Portal at <http://www.climatechange.ca.gov/index.html>.

¹⁰ For more on this topic, see "California's Water-Energy Relationship," <http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>.

Availability and financial factors also favor water conservation. San Mateo County is highly dependent on the Hetch Hetchy regional water system and thus vulnerable to water shortages today and in the future. Since 1971, when the last major supply improvements were added to the system, the number of people served by the Hetch Hetchy regional water system has increased over 28 percent and is expected to increase an additional 12 percent by 2030. As a system that relies upon the Sierra snowpack for its water supply, the Hetch Hetchy system can be disrupted by even a single dry winter, and may be heavily affected by changing weather patterns.¹¹

Looking to the future, the 27 local water suppliers that purchase water from the Hetch Hetchy regional water system have committed to using 10 percent less water by 2030 and face pressure to conserve even more.

Water rates charged by San Francisco to its wholesale water agencies will triple in the next several years, increasing from \$531 an acre-foot in 2007 to a projected \$1577 an acre-foot in 2015. These increased costs will be passed along to the individual water customer. Local governments and other water users thus have several compelling reasons to reduce their water consumption.

Clean Energy

When most people think of clean energy, they think of solar electric panels. Northern California leads the country in solar adoption, with an astonishing 44 percent of all U.S. customer-owned solar electric systems.

Several factors contribute to the increased popularity of solar electric systems in the region:

- The state's Million Solar Roofs allocates \$2.9 billion for solar rebates over 10 years, with a goal of financing 3000 megawatts of capacity by 2017. Government, residential and commercial customers are all eligible for rebates.
- Higher energy prices, uncertainty about future energy costs and better financing options make the high upfront cost of solar electric systems a lower barrier than in years past.
- Venture capital investments in the clean technology industry have exploded in the past two years, creating dozens of new solar companies in the Bay Area alone.
- Technology improvements have increased the efficiency¹² of photo voltaic (PV) cells, so a smaller system can generate the same amount of electricity at lower cost.
- New products can overcome traditional barriers, such as solar-integrated roof shingles that are less obtrusive than traditional PVs. New thin film technologies can be used in the tight spaces and odd angles of complex rooflines.
- Public and private sector installations are growing increasingly common and larger in scope. Solar is becoming a mainstream investment.

¹¹ Climate scientists predict that global warming will permanently reduce the Sierra snowpack by mid-century. See "Our Changing Climate: Assessing the Risks to California," pp 6-7, at <http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF>.

¹² In this context, "efficiency" refers to the amount of electricity actually generated by a solar cell, relative to the amount of solar energy received.

Several cities in San Mateo County have installed or plan to install solar electric systems to government facilities. Almost all jurisdictions in the county have lowered solar permit fees in recent years. Residents in a few cities in the county (e.g. Portola Valley and Woodside) have banded together to purchase solar electric systems as a group.

Solar thermal systems use sunlight to heat water and can save up to 75 percent of water-heating energy costs. New legislation has been introduced (AB 1470) to create a 10-year, \$250 million program to install 200,000 systems by 2017.

Other types of clean energy are also gaining traction. The County of San Mateo installed a co-generation system at the Maguire Detention Center, using natural gas to produce both heat and electricity. Millbrae's biogas wastewater treatment plant creates almost enough energy out of grease-trap water to run the entire facility. Pacifica is building a plant that will create biodiesel out of waste cooking oil and use it to power the wastewater treatment plant and city vehicles.

Fuel cells and wind turbines are also eligible for state rebates, although they have not yet been deployed by Bay Area governments.

Economic Opportunities

The rising public concern about global warming and explosive interest in all things “green” have converged to create a red-hot market for clean technology companies. Venture capitalists invested \$48 billion in 2006 alone in five market segments: energy, air, water, waste and sustainability. Silicon Valley is an early leader in the bid to attract and nurture this new industry, although New England, Austin and Chicago are also vying for the honor.

San Mateo County is already home to more than a dozen clean technology companies, ranging from Tesla Motors, a San Carlos-based startup creating an all-electric sports car to Li*on, a Woodside company that makes lithium-ion batteries. Many other clean technology companies are based in Santa Clara and other Bay Area counties. Local governments hope to benefit from job growth and economic expansion as these markets mature and expand.

79 percent of venture capitalists surveyed said that public policies are a factor in their clean technology investment decisions. 91 percent said that a pro-environmental public policy can attract clean technology business to a region.¹³ A Climate Protection Task Force sponsored by Joint Venture Silicon Valley Network (JVSVN) hopes to foster the local clean technology industry while helping government agencies reduce their greenhouse gas emissions. The JVSVN Task Force is further described in more detail later in this Report.

Mainstream and low-technology businesses are also touting their green business credentials, hoping to benefit from the growing consumer interest in environmentally-friendly products and services. The green market sector is now said to be the fifth largest in the U.S., and growing rapidly.

Barriers

USTF members and representatives from other cities consistently cite the lack of staff time, budget and technical expertise as key barriers to adoption of energy efficiency measures. California Local Energy Efficiency Program (California Leep), a project that analyzed local

¹³ *Creating Cleantech Clusters: 2006 Update*, <http://www.pewclimate.org/docUploads/Creatingpercent20Cleantechpercent20Clusterspercent20percent20Dpercent20percent20E2percent20percent26percent20CVNpercent20Maypercent202006percent20Epdf>.

energy efficiency programs across the state, confirmed that these challenges are widespread. It also found that energy efficiency projects can stall because financial models and political timelines optimize for quick payback and fast results—a poor match for some of the big-ticket measures that will provide the biggest impact over time.¹⁴

Water conservation efforts are also hard to implement at the local level, with few resources available to help cities overcome gaps in expertise and funding.

Resources

Many resources are available to help cities, companies and residents address the problems of limited money and technical expertise. **Cities and counties are eligible for many types of financial assistance and technical resources to help them improve energy efficiency in civic facilities and operations.** These include, for example, free compact fluorescent bulbs from PG&E,¹⁵ free energy audits of civic facilities¹⁶ and low-cost loans for energy-smart capital improvements.¹⁷ Expert advice, rebates, special utility rates, training and educational programs are offered to local governments by a host of providers, ranging from the energy agencies to local nonprofit groups. Similar energy-saving programs are targeted at the business community by the same providers and by industry-specific groups. Still other resources are available to individuals.

Rebates on water-efficient fixtures and tips for conserving water are also available to all three sectors. The Bay Area Water Supply and Conservation Agency, which was formed in 2003 by the agencies that buy water from San Francisco on a wholesale basis, provides assistance in developing and implementing water conservation programs with and for its member agencies.

The most critical barrier to resource conservation is the lack of time—time needed to understand the issues, program offerings and latest technologies, and to assess their financial implications. Accordingly, the Energy Strategy recommends strategies and measures that local governments, businesses and individuals can adopt to achieve cost-effective energy and water savings. Based on extensive research and analysis, the Energy Strategy identifies the resources that are most directly relevant and beneficial to San Mateo County communities, and recommends specific actions that can deliver maximum benefit for the effort invested.

The Energy Strategy lists resources that are directly relevant to San Mateo County communities and recommends specific actions

The Energy Strategy also offers suggestions for ways that staff-constrained cities can implement resource-saving programs as efficiently as possible. Local jurisdictions should consider whether and how to share knowledge with similar communities, hire interns, recruit a volunteer citizen task force and leverage the expertise of local nonprofits.

¹⁴ A list of the barriers is included in the California Leep report on p. 29, <http://www.caleep.com/docs/CaliforniaLeep-SummitProceedings-May2004-FINAL.pdf>.

¹⁵ Government staff can contact Kathy Lavezzo, a PG&E Account Manager and USF member, to set up a free-CFL program for their community. Kathy's direct line is (650) 598-7267 and her email is KOL1@pge.com.

¹⁶ ABAG Energy Watch and other Energy Watch partnerships offer audits and dozens of other services. See Appendix F for details under Energy Efficiency.

¹⁷ The California Energy Commission offers low-cost loans to cities and counties for energy-efficient investments. See Appendix F, Funding/ Financing Sources.

Conclusions

The data show that continued growth in the rate of energy use in San Mateo County will lead to additional energy infrastructure, higher energy bills and more greenhouse gas emissions. Reducing energy use will instead bring benefits such as lower costs and cleaner air. Water supplies will become scarcer and more expensive in coming years, so conserving water makes economic and environmental sense. Saving water helps lower energy use as well.

Local governments that use resources wisely will be role models for their residential and business communities, and be well-positioned to deal with future regulatory and technological challenges as they arise.

Other Bay Area cities have already achieved dramatic reductions in energy use in recent years. **San Mateo County communities can build on their own and others' energy-saving experiences and reduce energy consumption countywide without experiencing any hardship.** The know-how, resources and technologies already exist. By working together and leveraging the region's diverse strengths, San Mateo County as a whole can move toward a cleaner, greener and more prosperous future.

SECTION 4. GOALS

In accordance with its original charter and based on the context and findings, the Energy Strategy recommends five countywide goals that address the long-term energy needs of San Mateo County in an environmentally, socially and fiscally responsible manner. The goals address issues of collaboration, energy, water, economic opportunities and shared leadership.

COLLABORATION

The energy crisis of 2000-2001 and construction of the Jefferson-Martin transmission line in San Mateo County underscored the need for local governments to be more engaged in the energy planning process. The development of the Energy Strategy has provided an excellent opportunity for government leaders to learn about PG&E's planning responsibilities and constraints, and for the utility to understand which issues are important to city officials.

GOAL 1:

Establish an effective, interactive relationship with utilities for long-term planning and communications.

A new collaboration and communication process has been developed to keep local governments in San Mateo County informed about upcoming PG&E projects and engaged in the energy planning process. (The process is described in Appendix B.) Thus, the first level of the goal has been achieved. Further collaboration opportunities are being explored

ENERGY

Like transportation and air quality, energy use affects the county as a whole. A single set of infrastructure supplies energy to San Mateo and San Francisco Counties; it is managed at the regional level, without regard to local boundaries. In this shared world, the actions of one group affect all others. If all communities within the county reduce energy use and switch to cleaner forms of energy, new power plants and transmission lines can be avoided and all can share in the financial and environmental benefits. If, on the other hand, some communities continue on their current path, the negative impacts will affect all residents in the county.

Many of the harmful effects of centralized energy production can be reduced or eliminated by relying on clean, renewable energy sources and distributed generation. Long-term, renewable energy systems can dramatically reduce the cost of energy.

Accordingly, the Energy Strategy recommends:

GOAL 2:

Reduce overall energy use in each jurisdiction to 25 percent below current levels by 2020 and encourage the development and use of clean, renewable energy within the region.

Free services, new technologies and generous subsidies make saving energy easier than ever before, so cities committing to this goal can draw on many resources and programs for help. New subsidies and financing options also bring alternative energy systems within reach for most

local governments, as well as many businesses and households. Every community can decide how it wants to meet the goal, based on its own needs and strengths.

WATER

The communities in San Mateo County are highly dependent upon a single water system, the Hetch Hetchy regional system. The system is vulnerable to shortages due to drought and changing weather patterns. As with energy, a countywide effort is required to ensure the benefits of water conservation are enjoyed by all.

Thus, the Energy Strategy recommends that every jurisdiction:

GOAL 3:

Reduce overall (community-wide) water use by 10 percent below projected 2020 potable water use levels and by 15 percent below projected 2030 potable water use levels, so that water purchases from the Hetch Hetchy regional water system stay within the Supply Assurances for San Mateo County.

New technologies make water conservation painless to the consumer. Scheduled increases in water rates make water conservation a sound financial and environmental choice for local governments, residents and businesses.

ECONOMIC OPPORTUNITIES

San Mateo County is already home to several clean technology companies. By working with other cities in the region and industry groups, the county may be able to support and attract more such firms.

The broader business community can also become more competitive by understanding how environmental issues affect the bottom line. By helping local businesses become more resource-efficient and take advantage of new, "green" market opportunities, San Mateo County governments can boost the area's overall financial well-being.

Accordingly, the Energy Strategy suggests that local governments:

GOAL 4:

Strengthen the long-term economic health of the county by supporting green industries.

San Mateo County offers a Green Business Certification Program with guidelines on how local businesses can reduce their environmental impact. Nonprofits and industry associations offer programs and best practices to their members and the broader business community on specific topics. The Joint Venture Silicon Valley Network Climate Protection Task Force will help local cities support the local clean technology community through aggregated purchasing pools where appropriate.

SHARED LEADERSHIP

Every day, individuals, businesses and local governments make choices that impact the environment. Only by making better choices in every sector and at every level can San Mateo County achieve the goals set forth above and realize the related benefits.

GOAL 5:

Involve all government departments, the business community and residents in efforts to achieve the community-wide goals.

Better choices start with education. Government, business and household leaders need to know what options are available to them and the economic and environmental impact of those options. Leaders must then translate information into appropriate actions and metrics that can track progress toward the goals.

Local governments can exert a powerful influence in their communities by training staff and officials, improving government facilities, enacting ordinances and educating their residents. Businesses can take action in their facilities, partner with their customers and suppliers and encourage employees to use resources more efficiently. Individuals can take action at home, influence their employers and patronize local businesses that are participating in the effort.

Working together, the goals are achievable. San Mateo County can be a leader in the statewide effort to improve energy efficiency, conserve water and embrace clean energy.

* * * * *

Sections 5 and 6 of the Energy Strategy offer explicit guidance on how San Mateo County can meet or exceed these five goals.

SECTION 5. STRATEGIES

This section of the Energy Strategy sets forth the strategies that can help San Mateo County governments, businesses and residents achieve the Energy Strategy goals. The following section recommends specific actions to support the strategies. Resources to help implement the actions are outlined in Appendix F.

COLLABORATION

The issues addressed in this Energy Strategy are complex and will only grow more so after greenhouse gas regulations are issued at the state (and perhaps federal) level. Working as a bloc and with PG&E, the region can have a greater influence on policy. Sharing past experiences and resources will save jurisdictions time and money and improve results.

Strategy: Collaborate for mutual benefit

ENERGY

Energy-saving habits and energy-efficient technologies must become the norm if the Bay Area is to retain its high quality of life. Any new energy production capacity should be clean and renewable.

Strategies: Ensure that energy conservation efficiency become standard practice

Promote cleaner and greener sources of energy

Leverage relationships and governmental sharing

WATER

Existing supplies of potable water are not plentiful—less than one percent of the earth's water is suitable for human consumption and reserves are dwindling fast. Significant improvements in the way local governments, businesses and individuals use water are needed to ensure supplies are adequate to meet current and future needs. Saving water will also lessen energy use.

Strategy: Adopt water-saving practices and technologies

ECONOMIC OPPORTUNITIES

The clean technology sector can help drive economic growth and good jobs in San Mateo County. All businesses can reap economic benefits by reducing their use of resources and waste in their operations.

Strategies: Promote the clean technology sector

Encourage green business practices

SHARED LEADERSHIP

Big challenges need many leaders with diverse and complementary skills. To meet the Energy Strategy goals and enjoy the related benefits, individual communities and the region as a whole need the active involvement of government staff, elected officials, business leaders, residents, teachers and other interested parties.

Strategies: Invest in environmental expertise

Recruit, train, empower and reward leaders at every level

SECTION 6. RECOMMENDED ACTIONS

This section provides more detail about the strategies and recommends specific actions to help local governments meet the goals outlined in Section 4. Actions are categorized as Easy/ Short-term, Intermediate/ Medium-term or Advanced/ Long-term. In general, the easy actions should be quick to implement (0-3 months to implement), the intermediate actions may take several months and advanced actions might require a year or more of planning.

The Case Studies refer to other communities that have successfully implemented the suggested action. **Additional resource information is available in Appendix F; the relevant section heading is listed in parentheses following each entry.**

COLLABORATION

GOAL

Establish an effective, interactive relationship with utilities for long-term planning and communications.

STRATEGY

Collaborate for mutual benefit.

Local governments and utilities alike will benefit from working more closely together to minimize community disruptions and coordinate planning efforts. Jurisdictions that take a proactive role in understanding the issues affecting energy, water and other infrastructure providers will be better able to prepare themselves for known and unexpected developments (for example, water rate increases, storm-related outages).

In areas where utilities and governments share a policy perspective, they may wish to work together on issues at the regional or state level.

ACTIONS

Easy/ Short-term

- Add “energy update” as a standing item on City Council agendas
- Schedule quarterly meetings with PG&E representative about upcoming utility projects
- Individually and collectively, tell the four regional agencies—Associated Bay Area Governments (ABAG), the Bay Area Air Quality Management District (Air District), Bay

Conservation and Development Commission (BCDC) and the Metropolitan Transportation Commission (MTC)—what kind of assistance local governments need to improve energy efficiency and lower greenhouse gases. The agencies are considering where to invest and how to take action, so the time is ripe. Contact the Regional Planning Program Director of the Joint Policy Committee.

Intermediate/ Medium-term

- Support the passage of net-metering legislation at the state level to allow cities to “sell” their excess self-generated energy to the utility and apply the credits to their other government accounts

ENERGY

GOAL

Reduce overall energy use¹⁸ in each jurisdiction to 25 percent below current levels by 2020 and encourage the development and use of clean, renewable energy within the region.

STRATEGY

Ensure that energy conservation and efficiency become standard practice.

Energy efficiency is a way of life in many parts of the world where the infrastructure is less reliable or the cost of energy is higher than it is in the U.S. Increasing energy prices and global warming mandate that Bay Area communities adopt this approach as well.

Establish baseline use

There’s truth to the saying that “if you can’t measure it, you can’t manage it.” Without understanding current use levels, it’s impossible to track the effectiveness of specific energy- and water-saving measures or progress toward the goals.

The Air District is working with PG&E and to make it easy for cities to access their current and historical energy use data, and to establish a community-wide greenhouse gas emissions inventory that will document energy use.¹⁹

Different mechanisms are available for establishing and tracking a community’s baseline energy and water use, ranging from sophisticated software to a simple spreadsheet. **The Energy Strategy recommends that San Mateo County jurisdictions use the software from ICLEI—**

¹⁸ The goal applies to energy used in buildings and infrastructure throughout the community, but not energy used in transportation.

¹⁹ This is part of the Air District’s effort to establish an easy, low-cost way for all Bay Area jurisdictions to develop a greenhouse gas emissions inventory.

Cities for Climate Protection, an international nonprofit.²⁰ (More information about ICLEI is available in Appendix F, under Organizations > ICLEI.)

Create a plan

The baseline data will show cities which activities and users in the community consume the most energy and water, and help cities prioritize their efficiency efforts accordingly.

Local governments must play several important roles in leading the community to achieve the goals of the Energy Strategy. Where it makes sense, cities and the County should start by greening their own operations and facilities to save money and serve as a good example for others. The other roles are less direct, but will have more overall impact on meeting the goal. The roles are:

1. Owner/operator - managing municipal or county facilities
2. Regulator - enforcing codes, issuing permits and incenting behaviors
3. Influencer - encouraging local businesses and residents to modify habits
4. Educator - providing information to residents and employees

Information about implementation options for governmental facilities and regulations are addressed immediately below. A jurisdiction's opportunities to influence and educate members of its community are covered later in this section under Goal 5, Shared Leadership.

Improve government facilities and operations

There are many programs that can help cities identify and help pay for energy efficiency measures. **The Energy Strategy recommends that local jurisdictions start by enrolling in the ABAG Energy Watch program if they have not already done so.**

ABAG has partnered with PG&E to provide extensive energy efficiency services free of charge to local government agencies in the nine-county region. ABAG Energy Watch consultants can help city staff gather and analyze utility bills to identify which facilities are the most energy-intensive and which offer the biggest opportunities for savings. Energy Watch consultants can then perform a detailed energy audit and suggest specific measures based on the upfront cost, expected energy savings and long-term financial benefits. The Energy Watch program does not cover the cost of implementing the recommended measures (such as the installation of a new chiller, boiler or pump), but Energy Watch consultants can help city staff find funding sources and contractors to do the work.

In addition, Silicon Valley Leadership Group and Sustainable Silicon Valley jointly offer Energy Watch services to their members. An application is required to join any Energy Watch program and other criteria apply. More information is in the Energy Efficiency section in Appendix F.

Update the General Plan

²⁰ ICLEI has been working with the California Climate Action Registry, a public/private partnership that promotes early actions to reduce greenhouse gas emissions, to develop the protocol that municipalities will eventually use to report their emissions under AB32, California's Global Warming Solutions Act. Using the ICLEI software will allow cities to get started quickly and avoid having to re-do the inventory in a few years.

To ensure that its policies and actions are aligned, a city should also verify that its General Plan encourages resource conservation. If the Plan includes older elements that conflict with energy-efficient policies, water conservation practices or clean energy production (i.e. solar panels), the city should consider updating or adding a new element at the next revision of the General Plan. Energy Watch and other resources are available to help with this process. See below under Actions and in the Ordinances and Policies section of Appendix F.

Several other specific measures that a local government can take to reduce its energy use both short- and long-term are suggested below, under Actions.

Use incentives and ordinances to change behaviors

Civic leaders will need to influence residents and businesses to achieve the community-wide goals, and can use its regulatory authority to do so in a variety of ways. Since buildings use nearly 50 percent of energy in the country, ensuring that new construction and renovated buildings are energy efficient, conserve water and use renewable energy sources whenever possible is critical to reducing overall energy use.

Voluntary programs have proven effective in many Bay Area cities. These include using green building guidelines²¹ for educational purposes, as the basis for a condition of approval for certain types of permits or to qualify for expedited permitting. Cities can also encourage energy efficiency by offering technical assistance, design review and public recognition to those who exceed basic energy requirements.

Incentives are a low-cost and high-impact means of changing behavior. Incentives usually involve saving time, money or both. PG&E and the CEC offer a variety of financial incentives for builders of new single-family and multifamily homes, as well as commercial buildings, to use energy-efficient design techniques, appliances and lighting. Several San Mateo County cities have reduced or waived solar permit fees to encourage residents to generate their own power. Neighboring counties have started to offer a speedier permitting process for projects that meet a specific green or energy efficiency standard, either through coordinated inspections, fast-track status or over-the-counter permits. See more examples of incentives under the Financing/Funding Sources and Ordinances & Policies sections in Appendix F.

Mandatory energy efficiency and green building ordinances will have the greatest impact on energy reductions. Some jurisdictions may hesitate to pass ordinances requiring energy-efficient behavior, but given the need for ongoing, significant energy reductions, ordinances are the surest way to achieve results. As building science advances and familiarity with green building techniques becomes more commonplace, meeting increasingly stringent energy codes will become easier and more affordable. Building codes are expected to become more stringent on energy efficiency and green building issues by 2009. See details under Actions and in the Ordinances and Policies section of Appendix F.

ACTIONS

Easy/ Short-term

²¹ The San Mateo Countywide Guide to Sustainable Buildings and the Build It Green (BIG) single-family and multi-family Green Building Guidelines are examples of such guidelines, which outline dozens of methods by which new buildings or remodeling projects can reduce energy consumption. Rating systems can serve a similar purpose; examples are the BOG Green-Point Rated model and the Leadership in Energy and Environmental Design (LEED) rating system.

- **Join ICLEI** to get access to its inventory software, network of cities and consultants. (Organizations > ICLEI) Using data from PG&E and the local water supplier, develop a community-wide inventory of energy and water use by sector to spot the greatest opportunities for resource reductions.
- Replace **light bulbs** in all government facilities with the latest high-efficiency T8 lamps. (Energy Efficiency > Lighting)
- **Enroll in the ABAG Energy Watch program** for help assessing energy-saving opportunities in government facilities and operations, detailed building audits, policy assistance and numerous other tasks. Priority is given to government agencies that are willing and able to implement energy-saving actions that produce measurable kilowatt savings. (Energy Efficiency > SERVICES)
- A for-profit **Energy Service Company (ESCO)** can conduct energy audits and recommend equipment upgrades, often for no upfront fee. Under an Energy Savings Performance Contract, the ESCO will buy, install and maintain energy-efficient equipment in government facilities and guarantee savings to the city. An ESCO may also offer a Power Purchase Agreement, under which a government agency agrees to buy power generated by the ESCO (usually generated by a solar electric system on the agency's facility) under a long-term, fixed-price contract that is less expensive than the agency's current utility rates. (Energy Efficiency > SERVICES)

Intermediate/ Medium-term

- **Assign existing staff, hire a climate action coordinator or hire consultants** to create the inventory and develop a plan to save energy and water in the context of a climate protection plan. If neither staff nor funds are available, get help from a citizen task force and/or interns.
- **Update General Plans** to reflect and advance energy efficiency policies and encourage alternative and renewable energy sources. (Ordinances & Policies > GENERAL PLANS)
 - Create an Energy Element that specifically addresses energy issues and update existing language within the required seven elements (land use, circulation, housing, conservation, open space, noise and safety) and any optional elements to reflect energy goals.
 - Ensure language in the Energy Element provides support for existing or future energy efficiency programs, policies and projects.
 - If updating the general plan is a barrier, identify existing language that supports energy efficiency measures and use it as a basis for implementing programs.
- **Update Strategic Plans** to consider the impact of rising energy costs and shifting energy sources (from fossil fuel to renewable) when making or assessing long term planning decisions.
- **Adopt a green building standard for new civic construction** to act as a leader and a model for commercial and residential programs. (Green Building > RATING SYSTEMS)

- Hire architects and builders with significant green building experience to keep costs in line with traditional buildings.
- Review case studies and local municipal green building projects to garner political support.

Case study: Alameda County built its Juvenile Justice Center to the LEED Silver standard and reduced energy consumption to 46 percent below Title 24 and water consumption to 41 percent below code.

- **Adopt energy efficiency and green building ordinances** in residential and/or commercial sectors to drive behavioral change through regulatory authority. (Ordinances & Policies > ORDINANCES)
 - Review the General Plan, programs, policies and codes to identify areas that support or inhibit energy efficiency or green building ordinances. Garner political backing.
 - Work with planning, building and public works departments to identify building types and triggers with the greatest potential for energy savings (e.g. residential, commercial, commercial tenant improvements, additions, time of sale retrofits). Estimate potential savings.
 - Identify and involve stakeholders to gather input on pros/cons of voluntary vs. mandatory policies, to identify preferred standards, to create an implementation plan and to garner support.
 - Review and consider adopting standards similar to local jurisdictions to create regional consistency for builders, designers and developers.
 - Analyze the fiscal impact of the ordinance, determine funding sources and project measurable outcomes.
 - Understand the legal framework for implementing an energy efficiency and or green building ordinance in relation to Title 24 and the California Building Codes Standards (CBCS). Conduct an energy study and submit ordinance to CEC and CBCS for approval, if required.
 - Consider adopting an energy efficiency ordinance as a first step towards adopting a green building ordinance.
 - Educate staff, public, builders/designers/developers and policy makers on energy efficiency methods, green building, rating systems and ordinance processes. See Appendix F for a step-by-step ordinance implementation process.
- **Retrocommission** all major facilities through Energy Watch or ESCOs. (Energy Efficiency > SERVICES)

Case study: An Energy Watch audit revealed that San Mateo County could save energy and money by upgrading the lighting and HVAC on even its newest facilities. The annual energy savings for older buildings is even more compelling.

- **Adopt a green building standard** for new civic construction or all commercial construction (Green Building > RATING SYSTEMS)

- Hire architects and builders with significant green building experience to keep costs in line with traditional buildings.
- Update **financial tools** to include long-term operational savings as well as first costs or retrofit costs in cost-benefit analyses, and look at the internal rate of return and cash flow as well as simple payback. (Financing/Funding)

Case study: Sebastopol balanced low-cost, quick payback projects with long-term, bigger impact ones in its 20-year plan - and will be cash flow positive every year but one.

- Form **revolving funds** to pay for more efficiency measures through energy savings. (Financing/Funding > REVOLVING FUNDS)

Case study: Ann Arbor Michigan's \$100,000 initial fund paid for itself in eight years.

- Use energy savings to fund new staff positions and additional energy measures from energy savings or rebates.

Case study: The City of San Jose used a \$300,000 rebate from PG&E to fund an energy officer position for two years.

- Sign up for the **demand response** program from PG&E to receive lower rates in exchange for reducing use during peak demand. (Financing/ Funding > DEMAND RESPONSE PROGRAM RATES)

Advanced/ Long-term

- Install **energy accounting or utility management software** to monitor energy use, spot trends and identify opportunities for savings. (Energy Efficiency > AUDIT/ASSESSMENT > Software)

Case study: Oakland saved \$200,000 in the first year after it implemented a Utility Management System by discovering numerous accounting errors.

STRATEGY

Promote cleaner and greener sources of energy.

Fossil fuels are prime contributors to greenhouse gas emissions. Renewable energy sources are more varied and affordable than ever before, offering attractive alternatives to electricity and natural gas delivered by utility companies. Cities can encourage widespread adoption of these technologies by reducing barriers to their adoption.

Local governments, businesses and individuals can all hasten the transition from fossil fuel to clean energy in their communities, workplaces and homes by installing solar electric, solar thermal or other renewable energy systems. Solar fans are the cheapest and easiest form of alternative energy: for a few hundred dollars, they can help cool buildings without using any energy from the grid.

A solar thermal system is another relatively low-cost (less than \$10,000 for the average home, installed) and low-tech source of clean energy. It uses the sun's rays to heat water or other fluids instead of using fossil fuels to do so. In the Bay Area, solar thermal systems are most

often used to heat water for household use (showers and dishwashers) and swimming pools, and are sometimes also used for space heating. They can provide up to 75 percent of a household's hot water energy, lowering natural gas use and costs by a commensurate amount.

Solar electric systems are the most familiar and visible form of clean energy, and offer many economic and environmental benefits. Every building owner should know whether a solar electric system is feasible and cost-effective for its facilities. The key elements are simple:

1. An expanse of southern or western-facing roof, and/or space in a parking lot or field;
2. Little or no shade covering the area, and
3. An electricity bill of \$75 or more per month at the location.²²

The pitch, conditions and materials of the roof and the orientation toward the sun will make a solar electric system more or less easy to install and affect the system's efficiency (i.e. how much electricity it can generate). Financial incentives in the form of rebates, low-cost financing, tax credits and accelerated depreciation can all offset the high initial cost of installing solar electric systems. Once the system is paid for, the energy produced is virtually free.

Co-generation, biodiesel, biogas and fuel cell systems all capture and use waste energy to reduce or eliminate the need to use electricity or natural gas. Rebates and other financial incentives are available to help with the upfront cost, and the same long-term advantages apply as with solar electric systems.

If a building owner has no money to fund the initial purchase and installation or no interest in maintaining the system, it can still use clean energy and save money. For-profit companies called Energy Service Companies or ESCOs) will often purchase, install and maintain an alternative energy system on government facilities. The company will then sell the power generated from the system to the local government for less than the current cost of grid-supplied energy under a long-term Power Purchase Agreement. Because the contracts usually lock in rates at then-current levels, the agency avoids any energy cost increases over the life of the contract.

PG&E offers several classes on solar and other renewable energy systems at the Pacific Energy Center. Technical evaluations of these and emerging technologies are available through the ABAG Energy Watch program.

ACTIONS

Easy/ Short-term

- **Reduce or eliminate** permit fees for solar electric and solar thermal systems to encourage their widespread adoption. (Ordinances & Policies > ALTERNATIVE ENERGY > Incentives)

²² \$75 is the point at which a solar electric system starts to make financial sense for many households, where the cost of the electric bill plus the cost of a loan financing the system is usually less than the standard electric bill. See the section on Financing/Funding Sources > ALTERNATIVE ENERGY in Appendix F. Current law limits the ability of a utility customer to apply its solar "credits" earned at one site to electricity needs at another site, although there are efforts to allow government agencies an exemption.

Case study: San Carlos has issued ___ solar panel permits since waiving the fee, an increase of ___ percent over the previous period, and representing ___ kW of capacity.

- Invite Solar City or another solar installer to offer **group discounts to city residents**. (Purchasing > PURCHASING POOLS > Neighborhood groups > Solar systems)

Case study: 77 Portola Valley homeowners installed 355 kilowatts (kW) of solar capacity under the Solar City Collective Power program, increasing the total amount of solar electric systems in their community by 50 percent. In Woodside, 21 households installed 213 kW of capacity and in Mountain View, 119 homes installed 362 kW of solar electric power under the same program.

- Investigate the feasibility and financial impact of installing solar electric and solar thermal systems on government facilities.
- Install **solar fans** where appropriate to reduce cooling costs.

Intermediate/ Medium-term

- **Adopt ordinances** that incent or require residents and businesses to install alternative and renewable energy sources, such as solar electric and solar thermal systems.
- Install **solar thermal** systems at city facilities, especially swimming pools.
- Recruit and train **Green Energy Gurus** on staff and in the community.

Advanced/ Long-term

- Install **solar electric** panels on city facilities, either through purchase or under a Power Purchase Agreement with an ESCO. (Energy Efficiency > SERVICES > ESCOs)

Case Study: Solar panels produce ___ percent of the energy used at the wastewater treatment plant in Pacifica, and biodiesel provides the remaining ___ percent and fuels part of the city fleet.

- Develop co-generation, biogas, bio-fuel or fuel cell sources at city facilities.

Case Study: Millbrae's biogas plant collects 3000 gallons of restaurant kitchen grease daily and converts it into methane gas. The gas fuels a 250-kilowatt co-generation system that can produce 1.7 million kilowatt hours per year, or 80 percent of the wastewater treatment plant's needs.

Case Study: Pacifica is building a biodiesel plant which will convert waste vegetable oil into power that will run the plant, the adjacent wastewater treatment facility and a portion of the city's fleet. The city expects to save \$200,000 a year in energy costs.

STRATEGY

Leverage relationships and governmental sharing.

Cities within San Mateo County vary in geographic size, population, affluence, political climate and level of commercial and industrial activity. The communities also differ in terms of the type and quantity of energy-saving measures already implemented.

Despite these differences, every city shares certain key energy characteristics with several of its neighbors. They may be able to save significant time and money—and minimize risk—by sharing their past energy efficiency experiences and future plans with one another.

Based on average household electricity use and the ratio of commercial to residential electricity use, the 21 jurisdictions in the county can be separated into four groups. The groups are named for colors, although numbers, letters or more descriptive terms can be used.

Cities sharing an energy profile

<i>Group</i>	<i>Jurisdictions</i>	<i>Avg annual household electricity use</i>	<i>percent electricity used by businesses</i>
Yellow	Brisbane, Colma, South San Francisco	< 5000 kW	most (80-93 percent)
Teal	Burlingame, East Palo Alto, Menlo Park, Redwood City	5000-6000 kW	substantial (52-80 percent)
Purple	Belmont, Daly City°, Foster City, Half Moon Bay, Millbrae, Pacifica, San Bruno, San Carlos, unincorporated San Mateo County, San Mateo	5200-7300 kW	balanced (44-66 percent)
Orange	Atherton, Hillsborough, Portola Valley, Woodside	13,000-20,000 kW	low (<28 percent)

°Daly City’s average household use is 4900 kW.

Cities within each group will face similar challenges and opportunities when trying to meet a community-wide energy reduction goal. For example, all four cities in the Orange group have very limited municipal facilities and virtually no commercial energy users. The only way for them to achieve a citywide energy reduction goal will require residents to become more energy efficient or start generating their own power.

All four of the Orange cities have reduced solar permit fees in recent years; solar installer Solar City has worked with two of the communities (Woodside and Portola Valley) to install hundreds of kilowatts of residential solar system capacity. By comparing data on the impact (if any) of these and other energy-saving measures already taken, the four cities can learn what worked and adjust their own strategies.

At the other end of the spectrum, the Yellow cities can only reduce overall energy use by working closely with their commercial sector, since they also have limited government facilities. With the help of the local Chambers of Commerce and business leaders, the cities can first identify which businesses have the greatest potential to save energy and water (e.g. commercial laundry facilities, restaurants and/or retailers). After the target sectors are identified, the cities can suggest appropriate energy-efficiency programs to their local businesses. The time and effort required to do the analysis and roll out a program across four

cities would be only slightly more than to do it for one city, and can deliver many times the impact.

The Teal and Purple cities have more government facilities than the other two groups and a more balanced mix of residential and commercial interests. **Measures that have worked well in one city are likely to work well in similar communities.** By sharing the “lessons learned” and financial analyses from past projects, cities can help their neighbors save time and reduce the risk of implementation pitfalls, and be helped by others in turn. The Joint Venture Silicon Valley Network Climate Protection Task Force is a forum for cities to share such information and develop common strategies for and lowering energy use and reducing greenhouse gas emissions.

Working together, one city might be able to design and manage a program for multi-family buildings while another investigates water conservation options at golf courses. A third might target office buildings and a fourth might focus on hotels or restaurants. By sharing their research and results of their efforts, every city can save time and the region as a whole can reach its resource reduction goals.

ACTIONS

Easy/ Short-term

- **Collaborate** with other cities that have similar results from their baseline inventory and the energy profiles listed above. Compare notes on past resource-saving efforts and develop common strategies where appropriate.
- **Join the Joint Venture Silicon Valley Climate Protection Task Force** to share best practices, develop common strategies, access technical resources and get discounts on energy-saving or energy-generating equipment purchased in quantity. (Organizations > JOINT VENTURE SILICON VALLEY NETWORK)

WATER

GOAL

Reduce community-wide water use by 10 percent below projected 2020 potable water use levels and by 15 percent below projected 2030 potable water use levels, so that water purchases from the Hetch Hetchy regional water system stay within the Supply Assurances for San Mateo County.

STRATEGY

Adopt water-saving practices and technologies.

Per-capita water use throughout the Hetch Hetchy regional water system has decreased as residences and businesses have become more water-efficient in recent decades. In 2005-06, the average water use per person was 88 gallons per person per day, 15 percent lower than in 1986-87 (before the last drought) and 23 percent lower than the 1976-77 levels. Even so, many additional water conservation opportunities exist. **Unlike energy conservation, however,**

state or federal government funding isn't readily available for water conservation programs. Instead, they must be funded from local water rate revenues and implemented by the local water supplier.

Cities can look for projects that save both water and energy, which may then be covered by energy-efficiency programs and funding. With water prices in the Hetch Hetchy system expected to triple by 2015, there are significant economic benefits for all sectors to implement cost-effective water conservation.

Improve government facilities and operations

Local governments can establish their baseline by getting water use levels from their local water suppliers. Agencies can save money and water by installing high-efficiency fixtures in City Hall, libraries, fire stations, police facilities and public recreation areas. By ensuring that grounds and gardens feature drought-tolerant plants and high-efficiency irrigation systems, they can reduce water use even further and serve as role models to residents and businesses in its community.

Use incentives and ordinances to change behavior

Cities can use ordinances to either incent or mandate building owners to comply with green building standards that encourage the use of water-efficient appliances and landscaping practices. Where feasible, local governments may choose to offer financial incentives that can offset the cost of water-saving plumbing fixtures or irrigation equipment.

Water agencies can influence customer behavior by implementing tiered rate structures that encourage water conservation.

ACTIONS

Easy/ Short-term

- Replace older, inefficient toilets in city facilities with **high efficiency toilets** that use 20 percent less water per flush. (Water Conservation > FIXTURES > Toilets)
- Ensure city facilities use **drought drought-tolerant plants** and appropriate water conserving irrigation (**drip irrigation** or "**Smart Controllers**"). (Water Conservation > Landscaping)
- Use recycled water or switch to **artificial turf** for playing fields. (Water Conservation > LANDSCAPING > Parks and open spaces)

Case Study: Redwood City replaced one of its playing fields with turf and saved 2.8 million gallons of water a year and decreased maintenance costs. It plans to replace six additional fields with turf.

- Use **recycled water** on golf courses and playing fields. (Water Conservation > LANDSCAPING > Recycled water)

Case Study: Daly City currently produces and delivers 5.5 million gallons per year of recycled water to three neighboring golf courses, other city parks and open space areas.

- **Adopt tougher water conservation ordinances**, and enforce compliance with existing water conservation ordinances (e.g. landscape ordinances). (Ordinances & Policies > WATER CONSERVATION)
- Offer **financial incentives** to offset the purchase price of high-efficiency toilets, smart irrigation controllers, high-efficiency washing machines and other water-saving appliances.

Case Study: When Redwood City purchased more water from San Francisco than it was allotted, it instituted a high-efficiency toilet program. The city put demonstration models on display, sponsored a free “give-away” of the high-efficiency toilets, installed them for multi-family and non-residential customers and gave rebates to residential customers for the purchase of qualifying toilets. Within 36 months, 6500 toilets were replaced for an estimated *annual* water savings of 200 acre-feet or 65,170,200 gallons.

- **Implement a water-conserving rate structure** intended to signal the need to conserve, and to potentially provide funding for water conservation programs.

Case Study: Burlingame’s water and sewer rates are helping tip the balance in favor of installing high-efficiency toilets at major hotels during renovations. At a cost of \$200 per toilet, the annual water savings are 2,683 gallons per fixture per year, with a simple payback of 2.2 years. A hotel will save \$4.69 for every 1,000 gallons on their potable water bill and \$7.62 per 1,000 gallons on the wastewater bill.

- Encourage local home improvement and plumbing fixture stores to expand their selection of high efficiency toilets, faucets and other plumbing fixtures.
- Encourage local businesses to install **high-efficiency toilets** that use 20 percent less water per flush and **sensor-activated sinks** in high-traffic areas.
- Encourage local nurseries to promote climate-appropriate plants, and local businesses to landscape with them.

Case Study: Alameda and Contra Costa Counties have implemented **Bay-Friendly Landscaping Guidelines** for landscapers, nurseries and homeowners to reduce water use, eliminate pesticides and reduce runoff to the Bay.

- **Increase public awareness** of the value of water and the importance of water conservation and landscape water use efficiency and inspire them to action.
- **Promote available rebate programs** for high-efficiency washing machines, urinals, and toilets. (Water Conservation > ??)

Intermediate/ Medium-term

- **Update General Plans** and municipal codes to water conservation policies and support the new state-mandated landscape guidelines. (Ordinances & Policies > WATER CONSERVATION > General Plan).
 - Review the General Plan and identify existing language relevant to water use and efficiency.

- Update the language within the current seven elements (land use, circulation, housing, conservation, open space, noise and safety) or create a new Water Element that specifically addresses water efficiency and reuse.
- **Update Strategic Plans** to consider the impact of rising water rates and decreasing availability on long-term planning projects.

ECONOMIC OPPORTUNITIES

GOAL

Strengthen the long-term economic health of the County by supporting green industries.

STRATEGY

Promote the clean technology sector.

The clean tech sector is already being compared to the high tech industry as a long-term economic engine for the Bay Area generally and Silicon Valley in particular. As venture capitalists pump money into startups and their alternative energy and energy-saving technologies start to gain market share, the economic impact of the green economy will spread.

Jurisdictions can accelerate this growth by buying from these local businesses and offering tax or other incentives as appropriate.

ACTIONS

Easy/ Short-term

- Invite venture capitalists to speak at local forums to educate the broader community about the importance of the clean technology sector.
- **When in the market for alternative energy or energy-saving products, buy from local companies whenever possible.** Join the Joint Venture Silicon Valley Climate Protection Task Force to take advantage of technical evaluations and group discounts.

Intermediate/ Medium-term

- Consider offering tax or other incentives to attract clean tech businesses to San Mateo County.

STRATEGY

Encourage green business practices.

The “green” market is now the fifth largest sector in the U.S., providing jobs and attracting capital and an increasing range of customers. Local governments can help foster the growth of green businesses in their community by offering incentives, recognition and buying from local companies that have reduced their environmental impact.

The County’s new Green Business Certification Program provides guidelines and resources for businesses to use less water and energy, reduce waste and limit toxics in the workplace. Local jurisdictions may wish to consider creating a Green Enterprise Zone and a Green Job Corps (to develop more green-collar jobs involving environmentally-friendly products and services) if they prove to be effective in Oakland and other Bay Area cities.

ACTIONS

Easy/ Short-term

- Recognize or feature local green business at City Council meetings or other public venues.
- Offer a discount or rebate on the business license fee to businesses that achieve Green Business Certification.
- Implement or update an Environmentally Preferable Purchasing Policy that favors local suppliers wherever possible.

Intermediate/ Medium-term

- Sponsor a competition among different retail districts or office parks to see how many businesses can become certified as a Green Business. Run a program with the local Chamber of Commerce of local merchants association urging consumers to patronize local green businesses.
- Track progress of Oakland’s green jobs development program.

SHARED LEADERSHIP

GOAL

Involve all government departments, the business community and residents in efforts to achieve the community-wide goals.

STRATEGY

Invest in environmental expertise.

Only a handful of jurisdictions in San Mateo County currently have full-time employees assigned to environmental issues such as waste management and recycling, green building, energy efficiency, water conservation and climate protection. Such staffers usually cover all of these areas, and perhaps others as well. Budgets for environmental programs are also stretched thin.

In recent years, however, public demand for action on energy and climate matters has increased dramatically, new climate protection legislation has been passed and changing Bay Area weather patterns have threatened energy and water supplies. **Government staff and elected officials need to become more knowledgeable about how energy, water and climate issues relate to and affect the county's economy and quality of life.**

Staff positions dedicated to environmental issues can potentially pay for themselves many times over. A city can reap both financial and qualitative benefits by having such expertise on staff, by:

- Lowering its utility bills by proactively looking for ways to save water and energy.
- Avoiding high electricity rates by managing peak power demands.
- Catching and correcting any utility billing errors.
- Taking advantage of existing state programs, financial incentives and other offers.
- Ensuring sufficient water for current needs and anticipated growth.
- Minimizing solid waste landfill, reducing waste generation and maximizing recycling in accordance with AB939 (Integrated Waste Management Act).
- Limiting wastewater discharge, thus limiting the need for additional wastewater treatment facilities and benefiting the Bay.
- Reducing greenhouse gas emissions in accordance with AB32 (Global Warming Solutions Act) and supporting regulations.

Countless programs are designed to help local governments use natural resources wisely. Having a staff member, consultant or intern that can recognize which programs match local priorities can help secure the maximum benefits available.

Elected officials will also benefit by becoming more familiar with energy and environmental matters, as green values and actions become ever more important to voters and business owners.

For the same reasons that a city can benefit from having in-house environmental expertise, the county as a whole can be rewarded by such an investment. The Energy Strategy recommends that C/CAG or CMEQ level allocate budget and staff to address the mounting number and importance of environmental issues, and take full advantage of resources offered by the state, regional agencies and other entities.

ACTIONS

Easy/ Short-term

- Take advantage of free or low-cost **training opportunities** offered by Energy Watch, the Pacific Energy Center, Sustainable Silicon Valley, RecycleWorks, Build It Green and other organizations. (Education)

- **Identify a point person for environmental issues on City Council and on staff** (even if the staff person has another job). If at all possible, **assign budget and full-time staff** to manage environmental programs. Duties will include:
 - Complying with stormwater pollution prevention regulations.
 - Complying with AB 939 regulations and reporting requirements.
 - Managing garbage and recycling services.
 - Promoting waste reduction and recycling to residents and businesses.
 - Staffing environmental task forces and commissions.
 - Educating public and staff about energy efficiency, green building and water conservation.
 - Promoting transportation alternatives.
- If it's not possible to assign full-time staff, try the following:
 - Recruit college or graduate school interns with environmental expertise; many are eager to work with cities and acquire valuable work experience.
 - Share a single resource (part-time, FTE or intern) among several cities with a similar energy profile.

Intermediate/ Medium-term

- **Establish an Energy Task Force** to identify, analyze, plan, prioritize and implement energy-saving measures in civic facilities and the broader community.
 - Try to include representatives from facilities or public works, finance, the City Manager's office and the City Council to ensure that energy efficiency plans are cost-effective, adequately resourced, and supported by the affected departments and individuals.
 - If no staff resources are available, start a Citizen Task Force to do research and help with planning and prioritization. Palo Alto, Menlo Park and other local cities have Green Ribbon Task Forces at work.
 - In the alternative, create a multi-jurisdictional Energy Task Force with representatives from different cities with a similar energy profile. Facilities, financial issues and energy-saving opportunities may be similar enough to make a joint approach politically feasible and cost-effective.

STRATEGY

Recruit, train, empower and reward leaders at every level.

Change doesn't happen without strong, visible, committed leaders who can articulate a vision and guide others toward the desired state. Leadership in resource conservation must come

from elected officials and city staff, but is also needed throughout the community and at all levels. **Cities can increase the level of civic involvement, take advantage of free labor and make their own job easier by recruiting and empowering others to help meet the goals of the Energy Strategy.**

Menlo Park, San Mateo and other cities are creating Green Ribbon Task Forces to help shape policy and prioritize measures to mitigate climate change. Members of the community are eager to donate their time and expertise to gather data and sort through complex issues. But even cities that aren't yet ready to tackle climate change can take advantage of the growing public interest in environmental issues by recruiting city employees and volunteers to organize a program, teach a class, coach a neighborhood group or help a small business green its operation.

Partner with local businesses and nonprofits

The commercial sector represents half or more of the energy used in almost every city in San Mateo County, and in a few cases, dwarfs residential use. **Meeting the countywide energy and water use reduction goals will require the active engagement of the business community.** Fortunately, market and regulatory forces are raising awareness about the economic benefits of energy efficiency for businesses.

Some of the factors influencing businesses include:

- Energy prices continue to rise, cutting into operating budgets and margins.
- Energy-efficiency programs are available at little or no cost, and can dramatically reduce utility bills.
- Restrictions on water use and water rate increases are expected.
- Customers want to do business with green companies.
- Being energy- and water-efficient generates good PR and goodwill with stockholders.
- Large companies will be tracking developments of AB32 (Global Warming Solutions Act) and related regulation over the next several years.

PG&E offers an extensive array of programs and financial incentives for large and small businesses alike. Depending on the size and type of businesses within a community, **local governments may wish to partner with a local trade association, chamber of commerce or nonprofit organization to ensure awareness of existing energy-efficiency programs and encourage their use. Programs that save both water and energy for businesses will bring substantial benefits to the users and the broader community.**

The County has implemented a **Green Business Certification** program to help local businesses reduce their environmental impact. The program will emphasize energy efficiency and water conservation but also provide information on preventing pollution and reducing waste.

The real estate industry (rented and leased office space) uses more energy than any other in the county²³— 14.5 percent of total electricity and six percent of natural gas (2005 data). The average office building can readily reduce energy use by 30 percent simply by improving building operation standards, representing enormous savings potential.

Restaurants, cafes and drinking establishments are significant users (9.7 percent of the total) of natural gas in the county because they use hot water used for dishwashing and cleaning. Targeting these establishments for efficiency upgrades can help cities reduce energy use and save water at the same time.

Nonprofits like Sustainable Silicon Valley (SSV) play an important role in facilitating business-to-business sharing of best practices and networking opportunities. Members of SSV and SVLG can take advantage of Energy Watch retrocommissioning and other services. Green-oriented business

associations exist to support and encourage members. Small businesses may be more easily reached through the local Chamber of Commerce or a local merchants' association. See the Industry-Specific section in Appendix F for more information.

The real estate industry uses more energy than any other in the county—14.5% of the electricity and 6% of natural gas

Encourage individuals to embrace energy-efficient habits

After the energy crisis of 2001-2002, Flex Your Power was established as a statewide clearinghouse for energy efficiency information, programs and outreach campaigns. The millions of dollars spent each year on advertising, newsletters, a website, and other media have raised public awareness about energy efficiency, but studies show that information is not enough to create widespread, long-lasting behavioral change.²⁴ **Civic leaders can encourage and support energy-efficient behavior at little or no cost** by remembering to:

- Explain the energy reduction goal and the downstream financial, environmental and social benefits to residents in city newsletters, mailings, on the website, in meetings and via signs in city facilities.
- Model good behavior (e.g. using energy efficient lights and drought-tolerant plants).
- Recognize and reward energy-saving heroes, and
- Remove barriers to energy efficient behaviors (such as publicizing drop-off locations for discarded compact fluorescent bulbs).

Several environmental organizations have compiled lists of “10 things you can do” to save energy or combat global warming. Cities can endorse one of these lists and ask residents to pledge to take action on one or all.

²³ Real estate (531) includes renting, leasing or managing real estate for others, as well as buying, selling or appraising real estate. North American Industry Classification Systems (NAICS), <http://www.census.gov/epcd/naics02/naicod02.htm>.

²⁴ *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*, by Doug McKenzie-Mohr and William Smith (New Society Publishers, 1999), 8-11.

Water conservation is easier than ever before for the average citizen. A wealth of information on how to conserve is available directly from local water agencies, regional water entities such as the Bay Area Water Supply and Conservation Agency (BAWSCA) and the San Francisco Public Utilities Commission, and statewide organizations such as the California Urban Water Conservation Council. One example of a powerful tool to help residents conserve water in their garden and landscaping is BAWSCA's new CD-Rom, "*Water Wise Gardening in the Bay Area*". This interactive computer software is available from local water agencies and from BAWSCA directly and is free of charge. More information is in Appendix F under Water Conservation.

Another way cities can help residents adopt energy-efficient behaviors is through neighborhood-based teams. These groups are composed of several people or households who support and help each other learn how to reduce their ecological impact. Acterra, a Palo Alto-based nonprofit, can organize these teams and track their progress. A similar option that requires less logistical effort is for cities to promote and sell copies of an easy-to-use workbook aimed at individuals, households and groups, *The Low-Carbon Diet*.

ACTIONS

Easy/ Short-term

- Partner with businesses, nonprofits, schools and other groups to influence resource-efficient behavior in all parts of the community.

Case Study: The Small Business Energy Alliance received \$1 million in public goods funds for its Energy Savers Program for small business and local governments. In 2002, the City of Sonoma endorsed the SBEA matching fund program, which paid small businesses \$1000 or half the cost (whichever was lower) for lighting and equipment upgrades. Cloverdale plans to enroll 100 percent of its small businesses in the program. Participating businesses have saved between 20 and 60 percent on their energy bills.

- **Collaborate with other cities** in the area that have similar types of businesses.
- Leverage the energy efficiency programs and training offered by **BOMA International**, a trade association for building owners and managers. The San Francisco chapter is happy to partner with local governments to encourage energy efficiency in their members' buildings.
- Encourage local retailers to carry a large selection of compact fluorescent and LED lights and start limiting their supply of incandescent bulbs.
- **Target high-water use businesses** such as restaurants, laundry facilities, hotels and hospitals and for programs that can save both water and energy.
- Work with the local **Chamber of Commerce** and merchant associations.
- Leverage and support state and regional **public outreach and education** programs.
 - Reinforce the messages of Flex Your Power and other energy- and water-saving campaigns in formal and informal communications, city policies and actions.
 - Promote local workshops and training offered at the Pacific Energy Center, RecycleWorks, SSV, etc. (Education)

- Encourage neighborhoods to start Green Teams, and post their combined energy savings on the city website.
- Send letters of commendation to school teachers and students who demonstrate energy-awareness and the need for water conservation in science classes, science fair projects or other schoolroom activities.
- Post energy efficiency information and materials available on the city website, in city facilities, libraries and local stores, and encourage a friendly competition between neighborhoods for the most innovative energy and water saving ideas.
- Create an online suggestion box for energy- and water-saving ideas. Publicly recognize the people whose ideas are implemented.
- Recruit and train **Energy Ambassadors** from among city staff, residents and local businesses and ask them to share energy-saving information with their peers.
- Recruit and train **Water Ambassadors** to do the same for water conservation.
- Support existing neighborhood-based programs and publicize the existence of the Green Team Project. (Education > NEIGHBORHOOD GROUPS)

Bonus Section: **WASTE** (Actions suitable for a Climate Action Plan)

STRATEGY

Reduce waste through conservation, reuse, recycling and use of recycled materials.

ACTIONS

Easy/ Short-term

- Adopt or expand an **Environmentally Preferable Purchasing** policy. (Purchasing > Environmentally Preferable Purchasing)
- Participate in the Cal-Max Exchange.
- Increase local emphasis on **composting**.

Intermediate/ Medium-term

- Specify the use of **recycled** or **recycled-content** materials for public works projects, new facilities and upgrades, e.g. rubberized asphalt.

Case Study: The San Mateo County Public Works Department requires the use of ___percent fly ash in concrete used for construction and repairs.

- Institute a **construction and debris recycling ordinance**, or increase the percentage requirement of an existing ordinance.
- Adopt a **mandatory commercial recycling ordinance**, requiring businesses to recycle paper, cardboard, bottles, cans, plant trimmings.
- **Structure garbage rates** to incent waste reduction and recycling, charging progressively higher rates for higher garbage volume (not including recyclables or compost).
- Recruit and train **Waste Warriors** on staff and in the community.

Advanced/ Long-term

- **Adopt a higher landfilling reduction goal**, such as 75 percent by 2015, or pass a zero-waste resolution.

Case Study: San Jose, San Francisco and Oakland have zero-waste policies and have increased their diversion rates to __, 67 percent and __percent, respectively. [confirm]

- **Prohibit landfilling of organic materials**, such as plant and tree trimmings and untreated wood; ensure that they are picked up weekly.
- **Include food waste collection** in weekly plant trimmings pickup for residents, restaurants, schools, etc.

APPENDICES

APPENDIX A

Utilities & Sustainability Task Force Members

Elected Officials

Bill Dickenson
Councilman, Belmont

Deborah Gordon
Mayor, Woodside

Jerry Hill
Supervisor, County of San Mateo

Terry Nagel
Mayor, Burlingame

Barbara Pierce
Mayor, Redwood City

Sepi Richardson
Former Mayor/Councilwoman, Brisbane

Stakeholder Representatives

Energy

Bruce Chamberlain
Senior Project Manager, ABAG Energy Watch; Energy Solutions

Water

Nicole Sandkulla, P.E.
Senior Water Resources Engineer, Bay Area Water Supply and Conservation Agency

Utility

Kathy Lavezzo
Account Manager, PG&E

Nonprofit

Robert Cormia
Volunteer, Sustainable Silicon Valley

Large Business

Lori Duvall
Eco-Responsibility Program Manager, Sun Microsystems

Small business

Mario Panoringan
CEO, Daly City-Colma Chamber of Commerce

C/CAG

Richard Napier
Executive Director

Staff

Gina Blus
Principal, EcoAdvantage

Kim Springer
RecycleWorks Programs Manager, San Mateo County

Dianne Anderson
RecycleWorks Resource Conservation Specialist, San Mateo County

Brandi DeGarmeaux
Masters in Urban Planning candidate, San Jose State University

Members Emeritus

Jill Boone
Consultant
(former Staff)

Mukesh Khattar
Director of Energy, Oracle Corporation
(former Large Business Representative)

APPENDIX B

Status of City & County Efforts

<i>Jurisdiction</i>	<i>Elected contact</i>	<i>Staff contact</i>	<i>Resolution supporting ES</i>	<i>Resolution adopting ES</i>	<i>Member JVSVN Task Force</i>
Atherton					Y
Belmont	Bill Dickenson				Y
Brisbane	Sepi Richardson				Y
Burlingame	Terry Nagel				Y
Colma					N
Daly City					Y
East Palo Alto					Y
Foster City		Kristi Chapelle	Y		Y
Half Moon Bay					N
Hillsborough					Y
Menlo Park		Dianne Dryer?			Y
Millbrae		Shelley Reider			Y
Pacifica					Y
Portola Valley					N
Redwood City	Barbara Pierce	Magda Gonzalez?			Y
San Bruno					N
San Carlos					Y
San Mateo					Y
South San Francisco					Y
Woodside	Deborah Gordon				Y
County of San Mateo	Jerry Hill	Kim Springer			

APPENDIX C

Collaboration & Communication Process

APPENDIX D

Glossary

Adaptation Steps taken as a result of, or in anticipation of, changes to the natural and built environment caused by climate change.

Bay-friendly A term used to denote landscaping practices that are appropriate for the Bay Area climate (i.e. can handle wet winters and dry summers), limit or eliminate the use of pesticides and herbicides and reduce surface runoff.

Biodiesel Diesel fuel made from vegetable matter, sometime waste vegetable oil.

Bio-gas Fuel produced by the fermentation of organic matter such as municipal waste, manure or sewage sludge. Biogas is usually composed of methane and carbon dioxide.

Carbon offsets Investments in actions intended to reduce carbon emissions (or more generally, greenhouse gas emissions), made with the intention of slowing climate change.

Cap and trade A market-based mechanism used to modify behavior to achieve environmental benefits. Under the system, entities are granted a certain number of credits, e.g. to emit a some number of tons of a harmful chemical like nitrogen oxide or sulphur dioxide. Entities that use fewer than the permitted credits may sell their excess credits to entities that exceed their allotted number. A cap and trade system worked well to reduce acid rain in the Northeast in the 1980s. Europe has implemented a cap and trade system for greenhouse gas emissions that has been criticized for setting the number of credits too high.

Co-generation A traditional power source that captures and uses the waste heat generated by the process of producing electricity. Co-gen systems are sometimes called “combined heat and power “ (CHP) systems.

Commissioning Verifying that systems were properly installed and configured and are operating efficiently in a newly-constructed building. Retrocommissioning is the same process for an existing building.

Community Choice Aggregation (CCA) Cities that purchase power and sell it to their residents and business community in lieu of having those customers buy power from the local utility.

Compact Fluorescent Lamp (CFL) A lamp that uses approximately one-quarter of the electricity used by a comparable incandescent bulb. CFLs use more energy than LEDs. CFLs contain mercury and must be disposed of as a hazardous material.

Conservation The practice of using less of a particular resource, such as energy or water. Also used to describe efforts used to preserve or protect the natural environment.

Daylighting A green building design technique that relies on natural light as much as possible, thus saving energy used for task and general lighting.

Demand response Actions or programs intended to reduce energy consumption during specific periods, usually peak periods on summer afternoons.

Distributed generation Decentralized sources of power production, such as solar electric systems and wind turbines. Distributed generation is contrasted with centralized generation, where power is produced by utilities at power plants.

Energy audit An assessment of the current and potential energy efficiency of a building or process.

Energy efficiency The practice of using less or the least amount of energy needed to achieve a task.

Fuel cell An alternative, renewable energy system that uses compressed hydrogen, a catalytic agent (usually platinum) and oxygen to produce electricity, heat and water.

General Plan The official planning document for a city. State law requires that it include seven elements (land use, circulation, housing, conservation, open space, noise and safety), but may have more. It is updated roughly once a decade.

Geothermal An alternative, renewable energy system that uses the constant temperature of the earth (approximately 200 feet below the surface) to warm or cool a building. Geothermal systems are more common in colder climates than exist in the Bay Area.

Green energy/ green power A general term that refers to renewable forms of power generation such as solar electric, hydropower, wind energy, bio-based fuels, etc.

Hydrogen A chemical element that can be used to create energy. Some people believe that hydrogen can replace gasoline as a primary transportation fuel, although significant obstacles exist, e.g. in its natural state, hydrogen is a bulky gas. Hydrogen is the primary fuel in fuel cell systems.

Hydropower Electricity generated by extracting the energy released by water rushing over a stationary surface, such as a dam.

Light-Emitting Diode (LED) The most energy-efficient type of lamp commercially available at this time. LEDs are more efficient than CFLs.

LEED (Leadership in Energy and Environmental Design) A rating system developed by the U.S. Green Building Council to measure the degree of environmentally-friendly materials and techniques used in a building's design or operations. See Appendix under Organizations for more info.

Mitigation Steps taken to minimize or avoid foreseeable negative effects, e.g. of climate change.

Net-metering The ability to "sell" excess, locally-generated energy to the utility for a credit to be used at a later time.

Photovoltaic (PV) The most common type of solar receptor used in solar electric systems today. A photovoltaic cell is made of crystalline glass, usually blue. Several PV cells are contained on a panel. Several panels are assembled into an array, or a system.

Radiant heating and cooling A type of space conditioning system using water to conduct and transport heat throughout a building. The same process can be used to absorb heat and cool a building.

Renewable Energy Credit (REC) Energy users that wish to use green power but can't get it from their local utility sometimes choose to buy RECs (also known as "green tags") to help subsidize the market for clean, renewable energy. Producers of renewable energy own the credits and can sell them to a willing buyer. Prices vary, but average around 2 cents per kilowatt hour.

Retrocommissioning Commissioning an existing building to verify whether its systems are working as designed and to identify opportunities for performance improvements.

Smart controls In buildings, smart controls can adjust the temperature, lighting and other systems based on occupant behavior and other variables with the goal of minimizing energy use. In landscaping and irrigation, smart controls can adjust frequency and amount of water delivered to plants based on rainfall and temperature variables.

Smart growth An urban planning and design approach that favors density and use of public transit and opposes suburban sprawl and dependence on cars.

Solar

- **Passive heating/cooling** Passive solar design relies on a building's orientation toward the sun and mass to regulate internal temperatures and occupant comfort.

- **Electric** An alternative, renewable energy system that consists of a solar receptor (often photovoltaics, see above) and an inverter. The inverter converts the direct current (DC) flow of electricity generated from the sun into the alternating current (AC) used in residential and commercial settings. Many systems also have a connection to the utility grid and a meter.

- **Thermal (solar water)** An alternative, renewable energy system that uses the sun's rays to heat water for domestic or commercial use. Solar thermal systems in harsher climates use a liquid other than water to absorb solar energy and heat the water.

Time-of-use A utility rate that charges more for energy used when demand is highest (during peak periods, summer afternoons) and less for off-peak hours.

Water conservation Actions or practices intended to use less or the least necessary amount of water to perform the task.

Wind power An alternative, renewable form of energy production using stationary turbines to harness the energy in wind. The biggest challenge with wind power is its intermittent nature.

APPENDIX E

Task Force Reports

Energy Snapshot (6/5/2006)
Water-Energy Report (8/1/2006)
Big Users by Industry (8/1/2006)
Energy Use Projections (9/11/2006)
Transmission System Projects, San Mateo County (9/11/2006)
Recent Legislation (9/14/2006)
Cool Bay Area Cities / BAAQMD local government matrix
City/County Energy Ordinances (7/07)

Workplan and Actions (9/06)
Progress Report and Recommendations (2/26/07)