Energy Efficiency
California's Highest-Priority Resource

Lowering Energy Costs,
Promoting Economic Growth,
and Protecting the Environment

California Public Utilities Commission
and California Energy Commission

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ENERGY EFFICIENCY is California's highest-priority resource for meeting its energy needs in a clean, reliable, and low-cost manner. For more than three decades, California has adopted energy conservation and efficiency policies and made investments that are among the most aggressive in the nation. These efforts have saved more than 40,000 gigawatt-hours (GWh) of electricity and 12,000 megawatts (MW) of peak demand[1] – avoiding the need to build 24 large (i.e., 500 MW) power plants, and equal to the energy required to power 3.8 million homes.

The broader benefits of California's energy efficiency programs and investments include:

- Reducing energy supply costs and lowering bills for customers.
- Strengthening California's economy.
- Maintaining reliable energy services and reducing price volatility.
- Protecting the environment by reducing air pollution, greenhouse gases, and other environmental impacts of electricity generation.
- Conserving water by reducing end-use water consumption.
- Serving as a model for other states.

Energy conservation and efficiency have played, and will continue to play, an important role in meeting California's energy needs. California has only begun to tap its potential energy efficiency resources and can continue to achieve significant energy savings through investments in energy efficiency. The California Energy Commission estimates that, between 2003 and 2013, California can achieve 30,000 GWh of additional cost-effective efficiency savings.[2]

What Is Energy Efficiency?

Energy efficiency reduces demand for energy and peak electricity system loads. Common energy efficiency measures include hundreds of technologies and processes for homes, businesses, industry and manufacturing, and many other sectors of the economy. Examples include more efficient lighting, efficient heating and cooling systems, and superior energy management practices. The cost of these energy efficiency measures is more than offset by the resulting energy savings.

To establish the importance of energy efficiency to California's future energy picture, Governor Schwarzenegger has endorsed the *Energy Action Plan II* adopted in 2005 by the California Public Utilities Commission and the California Energy Commission. This plan established a "loading order" of preferred resources, placing energy efficiency as the state's top-priority procurement resource, and set aggressive long-term goals for energy efficiency. In addition, Governor Schwarzenegger's Climate Action Team is identifying and implementing strategies – including energy efficiency – to achieve the greenhouse gas emission reduction targets established in Executive Order S-3-05, issued by the Governor in June 2005.

Energy Efficiency Is Good for California

Energy efficiency is a proven, cost-effective resource for California. Through its energy efficiency programs, standards, procurement requirements, and partnerships with private and municipal utilities, the state of California is delivering a clean, reliable energy system that reduces costs for California's electricity and natural gas customers.

These programs include a variety of services that help businesses, households, government agencies, industrial facilities, and other customers lower their energy costs:

- Energy audits
- Rebates for efficient appliances, lighting, and equipment
- Design assistance
- Marketing and outreach

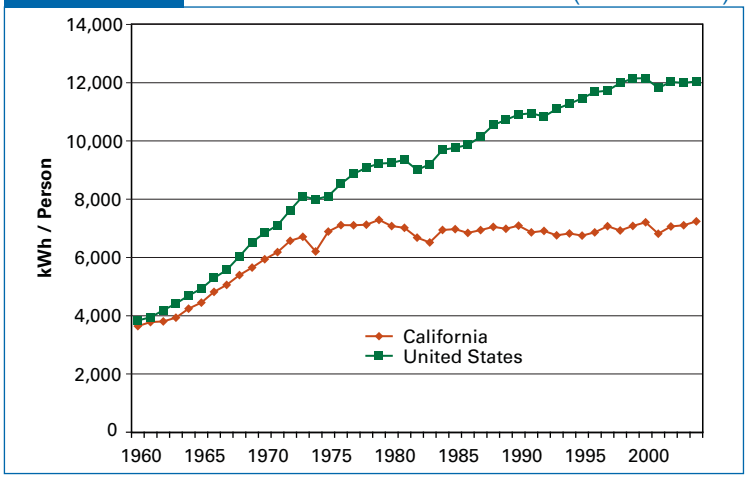
The benefits of energy efficiency are described below.

Lowers Energy Costs

California has a long, successful history of using energy efficiency to reduce demand for energy and peak electricity system loads, which reduces energy costs.

- Since 1975, California's building and appliance standards have reduced energy costs for individuals and businesses in California by $56 billion. These standards are expected to save another $23 billion by 2013.[3]
- Because of its energy efficiency standards and program investments, electricity use per person in California has remained relatively stable over the past 30 years, while nationwide electricity use has increased by almost 50 percent (see Figure 1).[4]

Figure 1 Per Capita Electricity Use in the United States and California (1960-2004)



Source: CEC 2005c

Supports Economic Development and Creates Jobs in California

Energy conservation and energy efficiency support economic development and create jobs by lowering energy costs, which allows businesses and households to make greater investments in non-energy goods, equipment, and services and reduces the outflow of money spent on imported energy supplies.

- Since 1975, energy efficiency investments have increased the state's economy by 3 percent (i.e., $31 billion) more than if the investments had not been made – equivalent to a net savings of $1,000 per household.[5]
- Each dollar spent on energy efficiency in California provides about $2 in net benefits.[6]
- By 2010, California's building energy efficiency standards will create 8,000 new jobs in California with a net economic benefit of $4 billion to the state's economy.[7]

Energy Efficiency Costs Less than Generating Electricity

The average cost of energy efficiency programs is about half the cost of base load generation. From 1997 to 2004, California's utility-run energy efficiency programs saved consumers and businesses approximately $4.1 billion.[8] Preliminary estimates put savings in 2005 alone at approximately $1.16 billion.[9] These programs save energy at a cost of less than 3 cents per kWh, less than half the per kWh cost of building new generation facilities.[10]

Improves Reliability

Using energy-efficient buildings and equipment to stabilize California's per capita electricity consumption reduces the state's need for new power plants and its dependence on natural gas, thereby increasing the reliability of the electricity system.

- In the summer of 2001, California's energy efficiency programs and energy conservation–related efforts saved between 3,200 and 5,600 MW and reduced peak demand by an average of 8 percent, which helped the state avert 50 to 160 hours of rolling blackouts.[11]
- California's long-standing commitment to energy efficiency has helped address reliability problems by allowing programs to "ramp up" quickly in response to short-term supply constraints. Many of these energy efficiency measures and consumer behavior changes have persisted, resulting in additional energy and cost savings.

Protects California's Environment

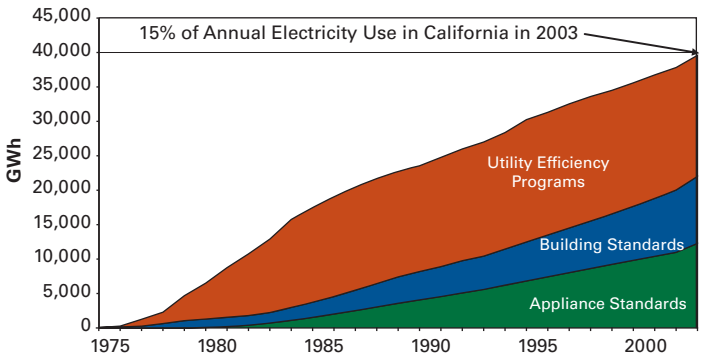
Energy efficiency reduces air pollution, water consumption, and waste associated with generating electricity from fossil fuels or using natural gas.

- Since 1975, California's energy efficiency programs and standards have cumulatively saved more than 40,000 GWh of electricity and 12,000 MW of peak electricity (equivalent to 24 large power plants), thus contributing to a 30 percent decrease in per capita carbon dioxide emissions.[12]
- Energy efficiency is a cornerstone of California's efforts to meet Governor Schwarzenegger's aggressive greenhouse gas reduction targets, established in June 2005. Energy efficiency measures in buildings are expected to reduce carbon dioxide emissions by 11 million tons by 2010.[13]

Building and Appliance Standards

California's internationally recognized building and appliance standards help businesses and consumers save energy through more efficient appliances, building design, equipment, and building materials. As of 2003, the amount of energy saved by these standards, along with the state's other energy efficiency programs, was equal to 15 percent of the energy used in California during that year. The California standards have served as a model for other states' appliance and building standards and for federal appliance standards.

Figure 2 Cumulative Savings from California's Energy Efficiency Programs (1975–2003)



Source: CEC 2005e

California's Comprehensive Energy Policy Framework

California is implementing a comprehensive energy policy framework that makes energy efficiency the top-priority resource for meeting future demand for electricity and natural gas. The framework includes the following components:

- *Energy Action Plan I* and *Energy Action Plan II*, coordinated implementation plans for state energy policies.
- Integration of savings goals into utilities' long-term resource plans.
- The *Green Building Action Plan Executive Order,* which sets a goal of reducing energy use in state-owned buildings by 20 percent by 2015 (from a 2003 baseline) and encourages the private commercial sector to set the same goal.

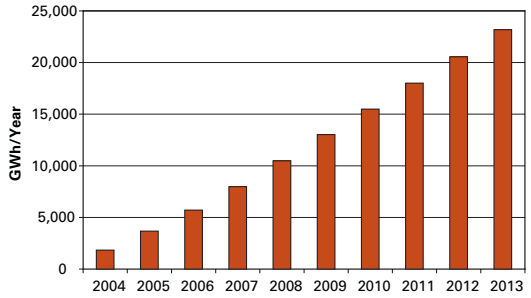
California's 2006–2008 Energy Efficiency Campaign

In September 2004, as part of the state's Energy Action Plan, the California Public Utilities Commission adopted energy efficiency goals for regulated utilities that will cut the growth of electricity and natural gas consumption by more than half by 2013, with net savings of $10 billion.[14] These goals, in conjunction with programs funded by the public goods charge on utility bills, will more than double the current level of energy savings over the next decade.

Between 2006 and 2008, California's electric and natural gas utilities will invest $2 billion in efficiency to help Californians reduce their energy bills. This 2006–2008 investment is expected to:

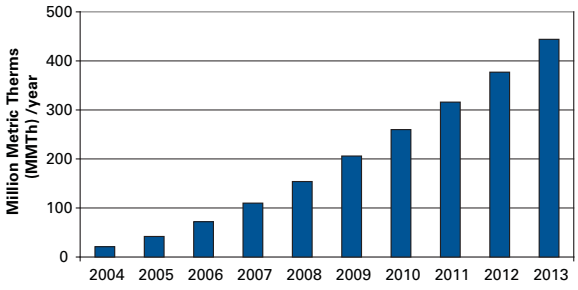
- Meet more than half of future electricity load growth and prevent the need to build three large (500 MW) power plants.
- Reduce carbon dioxide emissions by more than 3 million tons per year by 2008, which is equivalent to removing the annual emissions of 650,000 passenger vehicles.
- Achieve net savings of more than $2.7 billion for consumers.
- Decrease average customer bills by 2 percent by 2009.

Figure 3 Cumulative Energy Efficiency Savings Goals: Electricity Programs (2004-2013)



Source: CPUC 2004.

Figure 4 Cumulative Energy Efficiency Savings Goals: Natural Gas Programs (2004-2013)



Source: CPUC 2004.

- *Minimum efficiency standards* for buildings and appliances that are updated on a regular basis.
- A "*loading order,*" established in the state's Energy Action Plan, which requires utilities to prioritize their resource procurements as follows: (1) energy efficiency and demand response, (2) renewable energy, and (3) clean fossil-fueled distributed generation and clean fossil-fueled central-station generation.
- *Energy savings goals for each utility,* designed to capture all cost-effective achievable energy savings potential.
- A *procurement framework* that removes disincentives for utility investments in energy efficiency by decoupling revenues from sales volume and provides a risk/reward mechanism.
- *Municipal utilities' leadership* in increasing their investment in energy efficiency.

Looking Ahead: California's Energy Efficiency Opportunity

California continues to lead the nation in energy efficiency. The California Public Utility Commission and California Energy Commission are working in partnership with public and private utilities to develop new programs to implement the state's energy efficiency policy framework. These programs will achieve even greater savings for California's energy customers.

- Meeting the aggressive goals in the California Public Utility Commission's 2006–2008 Energy Efficiency Campaign will cut growth in electricity and natural gas consumption by customers of the state's regulated utilities — PG&E, SCE, SDG&E, and SoCalGas — by more than half.
- Implementing the 2004 updates to building and appliance standards will avoid the need for five large power plants in the next 10 years and reduce consumer utility bills by $3.3 billion.[15]
- Achieving the energy savings goals established in Governor Schwarzenegger's Green Buildings Initiative will result in new, innovative approaches and further advancements in energy efficient technologies and practices.

In addition, opportunities exist to actively engage a broad range of energy customers so that even more California businesses and residents can take advantage of the programs, funding, and services available to them. For example, many opportunities are available to improve energy efficiency within the industrial sector. Energy efficiency upgrades can reduce energy use by an estimated 30 percent, improvements to facility steam systems can save 20 percent on energy bills, and new technologies for motor systems can reduce energy by as much as 18 percent. Furthermore, because considerable energy is associated with water conveyance and treatment, the potential exists to reduce upstream energy use by reducing end-use water consumption. Recognizing the synergy between water and energy use and coordinating water and energy policies will help California effectively capture the embedded energy savings in water use.

These and other opportunities will help California meet its energy needs, protect the environment, and achieve significant cost savings in the years to come.

Endnotes

1 CEC 2005a
2 CEC 2003
3 CEC 2005b
4 CEC 2005a
5 Bernstein et al. 2000
6 CAL/EPA 2006
7 Roland-Holst 2006
8 NRDC 2006a
9 NRDC 2006b
10 CEC 2005d
11 Goldman et al. 2002
12 Oak Ridge National Laboratory 2004
13 Roland-Holst 2006
14 Grueneich 2005
15 NRDC 2006a; CEC2005a

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Energy Efficiency Information Resources for California

State Agencies and Initiatives	Energy Efficiency Information	Utility-Sponsored Programs
California Public Utilities Commission www.cpuc.ca.gov California Energy Commission www.energy.ca.gov California Green Action Team www.green.ca.gov California Climate Action Team www.climatechange.ca.gov	Consumer Energy Center www.consumerenergycenter.org Flex Your Power www.fypower.org ENERGY STAR www.energystar.gov 1-888-STAR-YES	Pacific Gas & Electric Company www.pge.com Southern California Edison www.sce.com San Diego Gas & Electric www.sdge.com Southern California Gas Company www.socalgas.com Los Angeles Department of Water and Power www.ladwp.com Sacramento Municipal Utilities District www.smud.com

For a complete list of electric utilities serving California, visit www.energy.ca.gov/electricity/utilities.html

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