

# Charting a New Path for California's Electricity Generation and Use



## California's energy future is at a crossroads

One path leads to increased dependency on fossil fuels—threatening our economy and fueling global warming. The other leads to a new, smarter energy future for California. Investing in clean energy alternatives—like solar and wind power—can create and protect jobs in California, save families and businesses money, and make America more energy independent. Clean energy is also the most effective solution to the threat of global warming. We can start making progress right away using proven technology, and then draw on American innovation to take us the rest of the way with new technologies.

### How does California generate electricity today?

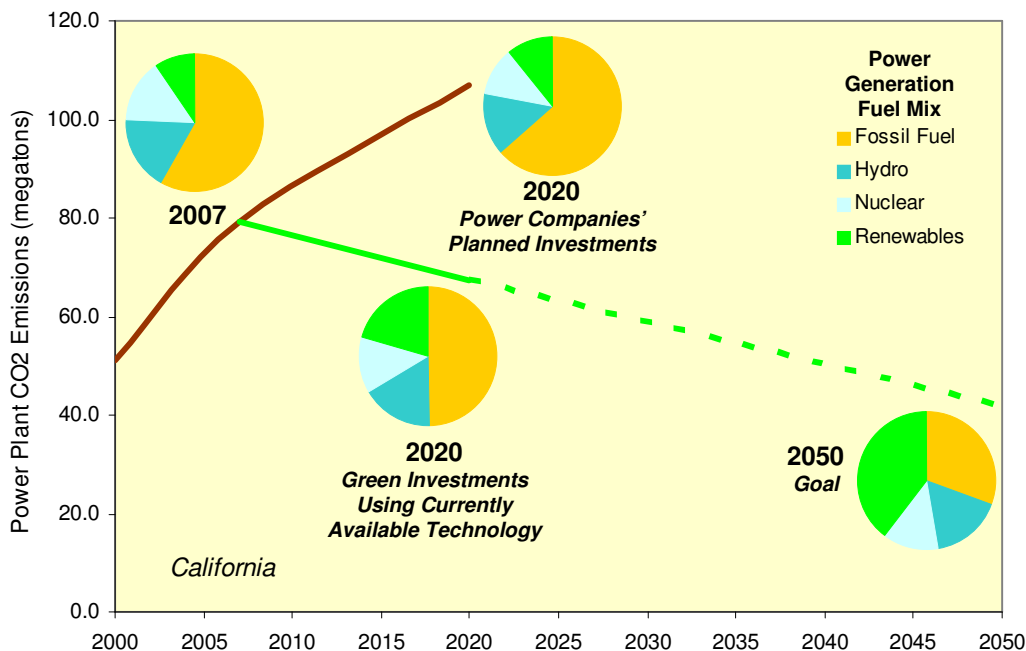
In 2007, electric power generated in California primarily came from gas (45.6 percent), hydro (17.5 percent), and nuclear (15.2 percent). Most utilities intend to continue relying heavily on fossil fuels in the coming decade. California power companies plan to increase the energy generation from gas by 52.4 percent. Only about 9.3 percent of electricity generated in California is expected to come from renewable sources like wind, solar, geothermal, and biomass under current plans.

### California has a choice to invest in a cleaner energy future

California can achieve a new energy future by making better investments as utilities replace increasingly aged infrastructure and expand capacity. An important first step is for California to generate at least 20 percent of electricity from renewable sources by 2020, a goal readily achievable with today's technology. Continuing to convert 15 percent of the state's energy portfolio to renewable energy sources each decade could yield an energy profile of at least 65 percent renewables by 2050.

California can also benefit from improved energy efficiency. Technologies are available that could reduce demand nationally by 20 to 30 percent over the next decade. Innovations in energy efficiency should allow us to keep demand constant after 2020, even as the population grows.

Today, California is ranked 10th in the nation for energy efficiency, largely because the state's utilities are already spending \$380 million annually to improve energy efficiency.



**About the chart:** 2000, 2007 and 2020 Power Companies' Planned Investments from CARMA 1.0 ([www.CARMA.org](http://www.CARMA.org)). The 2020 Green Investments projection assumes that, using currently available technology, California makes (1) improvements in efficiency to reduce overall demand by 25 percent and (2) shifts away from fossil fuels so that 20 percent of power generation is from renewable energy sources. The 2050 Goal assumes (1) hydro and nuclear are unchanged, (2) continued efficiency improvements keep total demand flat, and (3) renewable energy replaces at least 65 percent of power generation formerly done through fossil fuel burning. Note that the projection of future CO<sub>2</sub> emissions from fossil fuels assumes no investment in carbon capture and storage.

## Making a Difference in California

California leads the charge to develop America's new energy future by passing some of the most proactive legislation to increase the use and production of renewable energy. The state plans to produce 20 percent of its total energy from renewables by 2010, and 33 percent by 2020. Setting this goal has helped the once-struggling solar industry get off the ground, adding thousands of new jobs in the state. In 2007, Californian solar companies were among the fastest growing companies in the country, beating out giants like Google and Apple.

To encourage individuals and businesses do their part, California also passed legislation that provides up to \$200 for homeowners to upgrade their water heaters and up to \$1 million for businesses planning major energy saving redesigns.

### Sources:

[http://www.nytimes.com/2008/02/01/technology/01solar.html?\\_r=2&oref=slogin&oref=slogin](http://www.nytimes.com/2008/02/01/technology/01solar.html?_r=2&oref=slogin&oref=slogin)

<http://www.socalgas.com/energyefficiency/>



## Making a dent in global warming pollution

Simply by shifting to renewable energy sources and improving energy efficiency over the next decade or so, California can reduce its future carbon dioxide (CO<sub>2</sub>) emissions from electricity generation by 37 percent compared to the business-as-usual path that utilities are following now.

Given that 12 percent of California's CO<sub>2</sub> emissions come from electricity generation, diversifying and updating our power sources is critical for cutting the state's total global warming pollution.

## Increasing California's energy and economic security

Investing in renewable energy sources will reduce California's dependence on fossil fuels and at the same time create new green collar jobs. A new energy future in California could include:

**Expanded solar power.** California has enough solar resources to produce 4,500 to 6,500 Whr per square meter using photovoltaic systems and 3,500 to 7,500 Whr per square meter using concentrating solar power systems. This means that devoting just 1 square mile in California to solar power can provide enough electricity for about 1,600 households each year.

### References and Additional Reading:

American Council for an Energy-Efficiency Economy, [www.aceee.org](http://www.aceee.org).

American Wind Energy Association, [www.awea.org](http://www.awea.org).

Bioenergy Feedstock Information Network, [bioenergy.ornl.gov](http://bioenergy.ornl.gov)

CARMA (Carbon Monitoring for Action), [www.CARMA.org](http://www.CARMA.org).

Database of State Incentives for Renewables and Efficiency, [www.dsireusa.org](http://www.dsireusa.org).

Department of Energy, Energy Efficiency and Renewable Energy, [apps1.eere.energy.gov/states/alternatives/electricity.cfm](http://apps1.eere.energy.gov/states/alternatives/electricity.cfm).

**Expanded wind power.** California is currently ranked 2nd for wind power, with 2,484 MW of existing electricity generation capacity and 295 MW under construction. The American Wind Energy Association ranks California 17th in terms of its future wind potential, with 6,770 MW of potential capacity.

**Biomass power.** California has 11.3 million dry tons of biomass available each year that could be used to generate about 2,300 MW of electricity.

**Geothermal power.** California has 20 geothermal projects under development, with the potential to produce as much as 1,017 MW of new power capacity.

**New jobs.** Committing to a 30 percent growth in solar energy use in the United States will bring 10,437 jobs and \$8,538 million investment to California.

**A stronger economy.** California could realize as many as 12,717 jobs manufacturing wind turbines and \$4.24 billion investment in the wind industry alone if 50,000 MW of new wind energy is created on a national level.

## How does California use electricity?

California's energy is used to power:

- homes (34 percent),
- businesses (46 percent), and
- industry (19 percent).

Per capita residential electricity use is 2,478 kilowatt hours per year, 45 percent less than the national average.

Energy Information Administration, State Energy Data System, [www.eia.doe.gov/emeu/states/\\_seds\\_updates.html](http://www.eia.doe.gov/emeu/states/_seds_updates.html).

Environmental Protection Agency, Energy CO<sub>2</sub> emissions by state, [www.epa.gov/climatechange/emissions/state\\_energyco2inv.html](http://www.epa.gov/climatechange/emissions/state_energyco2inv.html).

Geothermal Energy Association, [www.geo-energy.org](http://www.geo-energy.org).

McKinsey Global Institute, 2007: *Wasted Energy: How the U.S. Can Reach its Energy Productivity Potential*.

Political Economy Research Institute, [www.peri.umass.edu](http://www.peri.umass.edu).

Renewable Energy Policy Project, [www.repp.org](http://www.repp.org).

*For more information, visit [www.nwf.org/globalwarming](http://www.nwf.org/globalwarming).*