Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

Renewing California

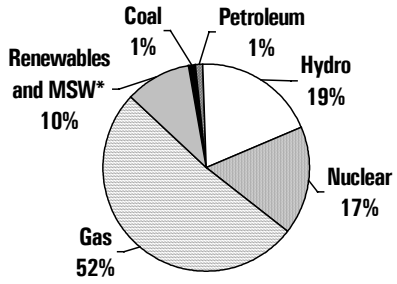
The Senate's National Renewable Energy Standard Will Benefit California's Economy

The U.S. Senate passed an energy bill in late April 2002 (HR 4) that contains the first-ever national renewable energy standard, which requires major electric companies[1] to gradually increase sales of electricity from renewable energy sources (wind, solar, bioenergy, and geothermal) to about 10 percent by 2020. A U.S. House-passed energy bill contains no such provision. A committee of House and Senate members began meeting to develop a final bill this summer, with plans to bring it to a vote in both bodies this fall.

UCS used a modified version of the U.S. Energy Information Administration's National Energy Modeling System computer model to examine the costs and benefits of the Senate's proposed standard – often called a renewable portfolio standard or RPS.[2] We found that this policy – along with Senate-passed tax credits for renewable energy – promises to bring economic development and energy security to California, as well as consumer and environmental benefits.

Current Electricity Mix. California relies heavily on natural gas and nuclear power to generate its electricity. California's over-reliance on natural gas combined with the volatile nature of gas prices lead to a power crisis in 2000, which continues to place a heavy economic burden on the state's energy consumers today. Due to a long time commitment to alternative energy in California, homegrown renewable energy sources such as wind and geothermal and currently provide 10 percent of the electricity generated in the state. In 2000, California imported about 16 percent of the electricity used in the state.

California's Electricity Mix, 2000



*Municipal Solid Waste
Source: EIA, 2002

California's Renewable Energy Potential

Resource	Generation (billion kWh)	% of 2000 Electricity Sales
Wind	85.9	35%
Geothermal	104.3	42%
Bioenergy	17.1	7%
Landfill Gas	8.7	4%
Total	216.0	88%

Renewable Energy Potential. California has the technical potential to generate nearly all of its current electricity needs from renewable energy. The resources with the greatest potential in California are wind and geothermal. California also has excellent solar resources that could theoretically provide all of the state's electricity use. While not all of the state's renewable potential will be developed due to economic, physical, and other limitations, the national renewable energy standard will spur significant development in California.

Renewable Energy Development. UCS analysis found that under a 10 percent renewable energy standard, California would lead the nation by increasing its total homegrown renewable power to nearly 13,900 megawatts (MW) by 2020. The majority of this development would be powered by California's strong wind and geothermal resources, with important contributions from bioenergy and landfill gas. This level of renewable development would produce enough electricity to meet the needs of nearly 10.5 million typical homes, provide 17% of all the electricity sold in the state, and reduce California's dependence on natural gas.

Economic Development. Renewable energy development would bring significant economic benefits to California. Through 2020, the national standard would produce

- $3.1 billion in new capital investment
- $223 million in new property tax revenues for local communities
- $79 million in lease payments to farmers and rural landowners from wind power[3]

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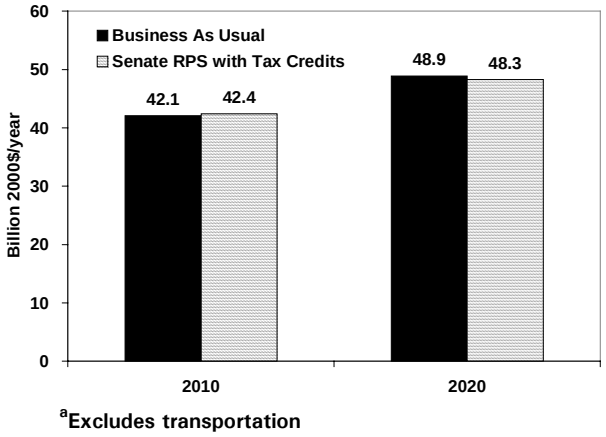
Consumer Costs and Benefits. The national standard and renewable energy tax credits passed by the Senate would slightly reduce long run energy costs to California consumers. Increased competition from renewable energy leads to lower natural gas prices that offset the incremental costs of meeting the renewable energy standard in the state. Total annual consumer energy bills (not including transportation) would be 0.8% higher than business as usual in 2010, but $590 million or 1.2 percent lower in 2020. Cumulative consumer savings through 2020 would be $480 million.[4]

Total Consumer Energy Bills, California[a]



[a]Excludes transportation

Environmental Benefits. The renewable electricity standard will reduce air pollution from power plants that threaten people's health by burning coal, oil, and natural gas. Carbon dioxide emissions, which trap heat in the atmosphere and cause global warming, would also be reduced. Nationally, the renewable energy standard will reduce about 27 million metric tons of carbon emissions a year by 2020. The renewable standard will also reduce harmful water and land impacts from extracting, transporting, and using fossil fuels.

The renewable standard increases consumer savings if natural gas prices increase

In the future, natural gas is projected to fuel much of the new electricity generation built in the United States without additional policies for renewable energy. This increase in demand for natural gas may lead to natural gas prices that are higher and more volatile than those used in our base case analysis. The more expensive natural gas is, the greater the savings will be from reducing natural gas use through a renewable energy standard.

Specifically, UCS examined the effects of a renewable standard on an alternative scenario where wholesale natural gas prices are 35 percent higher by 2020. In this case, cumulative consumer energy bill savings from the renewable standard would be nearly 3 times greater.

Providing a clean, safe energy future

A national renewable energy standard would make California's energy supply more reliable and secure. It would diversify the fuel mix using energy produced within the state. The renewable energy standard proposed by the Senate is a sensible step toward a balanced approach to meeting future energy demands with renewable technologies, and is far more responsible than continuing to rely on polluting or dangerous power sources. Renewable energy is ready to provide California with a clean, safe energy future.

Impact of National RPS Proposal in California

In 2020:	Senate RPS with Tax Credits	Senate RPS with Tax Credits (High Gas Prices)
Cumulative Consumer Energy Bill Savings[b]	$480 million	$1.4 billion
Annual Consumer Energy Bill Savings[b]	$590 million 1.2%	$1 billion 1.9%

Notes
a. All dollars presented in 2000$. Cumulative results are in net present value using an 8 percent real discount rate.
b. Excludes transportation.

The Union of Concerned Scientists is a nonprofit partnership of scientists and citizens combining rigorous scientific analysis, innovative policy development, and effective citizen advocacy to achieve practical environmental solutions. For more information, visit our web site at www.ucsusa.org/energy.

[1] Small utilities and publicly-owned utilities are exempted.
[2] More information about UCS' modeling approach can be found in the October 2001 report *Clean Energy Blueprint: A Smarter National Energy Policy for Today and the Future*, which is available at *www.ucsusa.org/energy/blueprint.html*.
[3] Results presented are in 2000$. Cumulative results are in net present value using an 8 percent real discount rate.
[4] The House and Senate energy bills include renewable energy tax credits worth between $2.6 billion (Congress' estimate) and $5.2 billion (UCS' estimate) over the next 10 years. The bills also include 10 years' worth of subsidies for fossil fuel and nuclear power totaling about $9.1 billion in the Senate bill and $28 billion in the House bill. The taxpayer costs of the additional subsidies for renewable energy and conventional fuels were not included in the analysis. (Note: these dollar figures are *not* discounted.)