



Renewing Arizona

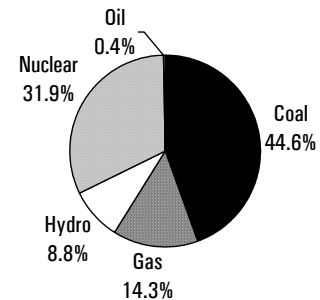
A National Renewable Electricity Standard Will Benefit Arizona's Economy

America's energy choices affect our national security, our economy, our family budgets, and our environment. Last year, the U.S. Senate passed an energy bill (HR 4) that contained the first-ever national renewable electricity standard, which requires major electric companies¹ to gradually increase sales of electricity from renewable energy sources (wind, solar, bioenergy, and geothermal) to 10 percent by 2020. However, the standard did not become law as a committee of House and Senate members failed to agree on a final bill before the 107th Congress adjourned. The newly elected 108th Congress should revisit the renewable electricity standard during the current national energy debate in order to move our nation away from polluting fossil fuels and toward a safer, cleaner, and more sustainable energy future.

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 last year's Senate renewable electricity standard (RES) proposal – 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 Arizona, as well as consumer and environmental benefits.

Current Electricity Mix. Arizona is heavily reliant on coal and nuclear power to generate 80% of its electricity. All of the natural gas, and over half of the coal is imported into the state, exporting dollars and jobs in the process. Homegrown renewable energy sources such as solar currently provide a negligible amount of the state's electricity. In 2001, Arizona generated 34 percent more electricity than it used.

Arizona's Electricity Mix, 2001



Source: EIA, 2003

Arizona's Renewable Energy Potential

Resource	Generation (billion kWh)	% of 2001 Electricity Sales
Solar	100.4	170%
Wind	6.9	12%
Geothermal	5.4	9%
Bioenergy	1.7	3%
Landfill Gas	0.5	1%

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

Renewable Energy Development. UCS analysis found that under a 10 percent renewable electricity standard, Arizona would increase its total homegrown renewable power to more than 550 megawatts (MW) by 2020. The majority of this development would be powered by Arizona's strong wind and solar resources. This level of renewable development would produce enough electricity to meet the needs of nearly 340,000 typical homes and reduce the use of imported coal and natural gas.

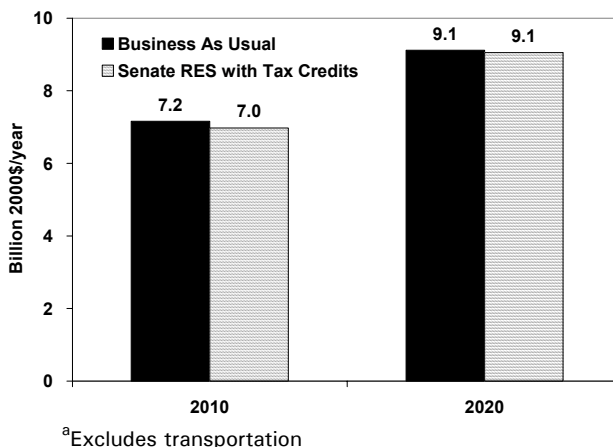
Economic Development. Renewable energy development would bring significant economic benefits to Arizona. Through 2020, the national standard would produce

- \$230 million in new capital investment
- \$20 million in new property tax revenues for local communities
- \$5 million in lease payments to farmers and rural landowners from wind power³

Consumer Costs and Benefits. The national standard and renewable energy tax credits passed by the Senate would slightly reduce long run energy costs to Arizona consumers. Increased competition from renewable energy leads to lower natural gas prices that offset the incremental costs of meeting the RES in the state. Total annual consumer energy bills (not including transportation) would be \$180 million or 2.5 percent less than business as usual in 2010, and nearly \$70 million lower in 2020. Cumulative consumer savings through 2020 would be \$860 million.⁴

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 RES will reduce about 27 million metric tons of carbon emissions a year by 2020. The renewable electricity standard will also reduce harmful water and land impacts from extracting, transporting, and using fossil fuels.

Total Consumer Energy Bills, Arizona^a



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 electricity standard.

Specifically, UCS examined the effects of an RES on an alternative scenario where wholesale natural gas prices are 35 percent higher by 2020. In this case, consumer energy bill savings from the renewable standard would be nearly 50 percent greater. Renewable energy generation and economic development would slightly less in Arizona if gas prices were higher.

Impact of National RES Proposal in Arizona

In 2020:	Senate RES with Tax Credits	Senate RES with Tax Credits (High Gas Prices)
Total Renewable Energy Capacity	550 MW	500 MW
Cumulative New Capital Investment	\$230 million ^a	\$227 million
Cumulative Consumer Energy Bill Savings ^b	\$860 million	\$1.30 billion
Annual Consumer Energy Bill Savings ^b	\$70 million 0.7%	\$270 million 2.7%

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

Providing a clean, safe energy future

A national renewable electricity standard would make Arizona's energy supply more reliable and secure. It would diversify the fuel mix using energy produced within the state. The renewable energy standard 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 Arizona with a clean, safe energy future.

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/clean_energy/index.cfm.

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/clean_energy/renewable_energy/page.cfm?pageID=44.
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 included 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 included 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.)