

## FACT SHEET

### A National Renewable Electricity Standard Will Benefit the Economy and the Environment

America's current energy system is dominated by fossil fuels, which pose serious threats to our health and environment and leave us vulnerable to price spikes and supply shortages. With the threat of global warming becoming increasingly urgent, we must make responsible energy choices today that ensure a safe, reliable power supply and a healthy environment for future generations.

Fortunately, there are practical and affordable ways to achieve this goal.



Photo: PPM Energy

Homegrown renewable energy resources—such as wind, solar, bioenergy, and geothermal—can help reduce our dependence on polluting fossil fuels. These clean energy sources can also help stabilize energy prices, stimulate the development of innovative new technology, and create high-quality jobs and other economic benefits.

Strong national policies can ensure these benefits are fully realized. The policy that has proven most effective

and popular at the state level is the renewable electricity standard (also known as the renewable portfolio standard or RPS), which requires electricity providers to supply a minimum percentage of their power from clean energy sources. As of June 2007, renewable electricity standards have been adopted in 23 states and Washington, DC. At the national level, the U.S. Senate has passed a 10 percent by 2020 national renewable electricity standard three times since 2002—most recently in June 2005.

Momentum continues to grow for a strong national standard. A 20 percent by 2020 standard was introduced in the House of Representatives in February 2007, and a 15 percent by 2020 standard is under consideration in the Senate.<sup>1</sup> Using a model from the Energy Information Administration (EIA), the Union of Concerned Scientists (UCS) examined the long-term effects that a national 20 percent by 2020 standard would have on the economy and the environment, under two different scenarios: an “EIA case,” which assumes no changes to the model, and a “UCS case,” which makes several modifications (described in the “Modeling Methods” on the back page). We then used the UCS case results to conduct additional analysis on the potential effects a national standard would have on job creation. The findings from the UCS case 20 percent national standard are presented below, followed by findings for the EIA case 20 percent standard.

#### 20 Percent by 2020: The Benefits of a National Renewable Electricity Standard

##### Job Creation

185,000 new jobs from renewable energy development

##### Economic Development

\$66.7 billion in new capital investment, \$25.6 billion in income to farmers, ranchers, and rural landowners, and \$2 billion in new local tax revenues

##### Consumer Savings

\$10.5 billion in lower electricity and natural gas bills by 2020 (growing to \$31.8 billion by 2030)

##### Climate Solutions

Reductions in global warming pollution equal to taking 36.4 million cars off the road

#### CONSUMER SAVINGS

Under the UCS case 20 percent national standard, consumers in all sectors of the economy would experience a reduction in both their cumulative electricity and natural gas costs compared with business as usual (BAU). Cumulative savings would reach \$10.5 billion by 2020 and, by 2030, would grow to \$31.8 billion (\$10.4 billion for households, \$13.4 billion for commercial customers, and \$8.1 billion for industrial customers).<sup>2</sup> In addition, energy bills would be reduced in *every* region of the country.

The national renewable standard saves consumers money by reducing the demand for fossil fuels and creating new competitors in the U.S. energy market. As a result, energy companies are limited in their ability to raise fossil fuel prices in the future. Compared with BAU, natural gas (and coal)

therefore cost less for electricity generation as well as for other purposes, benefiting both electricity consumers and natural gas consumers. Under the 20 percent national standard, average consumer prices for both electricity and natural gas would be slightly lower than BAU in nearly every year of the forecast, with an average annual reduction of 1.1 percent in each sector.

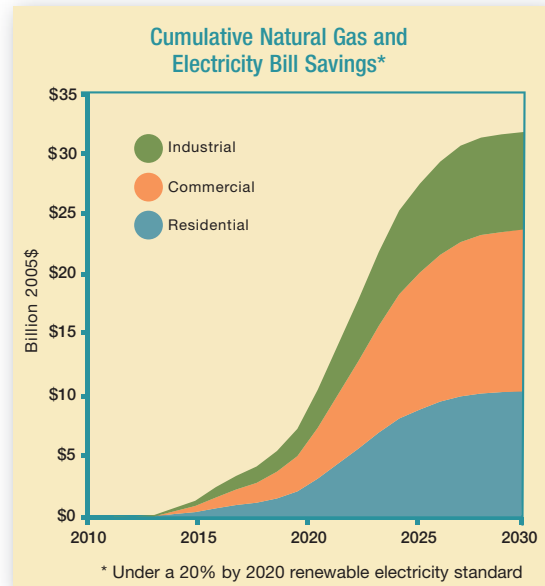
### JOBS AND OTHER BENEFITS TO LOCAL ECONOMIES

A renewable electricity standard would benefit the U.S. economy in other significant ways. For example, dollars invested in clean energy go toward high-quality jobs in manufacturing and construction, as well as jobs in operations, maintenance, finance, sales, shipping, and other industries. Jobs are also created when these workers spend their income on goods and services and when consumer energy bill savings are spent in the local economy.

By 2020, the total new renewable energy development needed to meet a 20 percent national standard would generate 185,000 jobs. State level poli-

cies—primarily renewable electricity standards—would make an important contribution toward this job creation total as well as spur other economic benefits. Excluding the development from full compliance with state standards, renewable energy technologies would create nearly three times as many jobs as producing an equivalent amount of electricity from fossil fuels—resulting in a net benefit of 120,000 jobs. The national standard would also generate an additional \$6.3 billion in income and \$5.7 billion in U.S. gross domestic product in 2020.

Renewable energy technologies tend to create more jobs than fossil fuel technologies because a larger share of the expenditures for renewable energy is spent on manufacturing equipment, installation, and maintenance, all of which are typically more labor intensive than extracting and transporting fossil fuels. Renewable energy facilities also do not need to export cash to import fuel from other states or countries (with bioenergy, money is spent on locally produced fuel), keeping money circulating in the local economy.

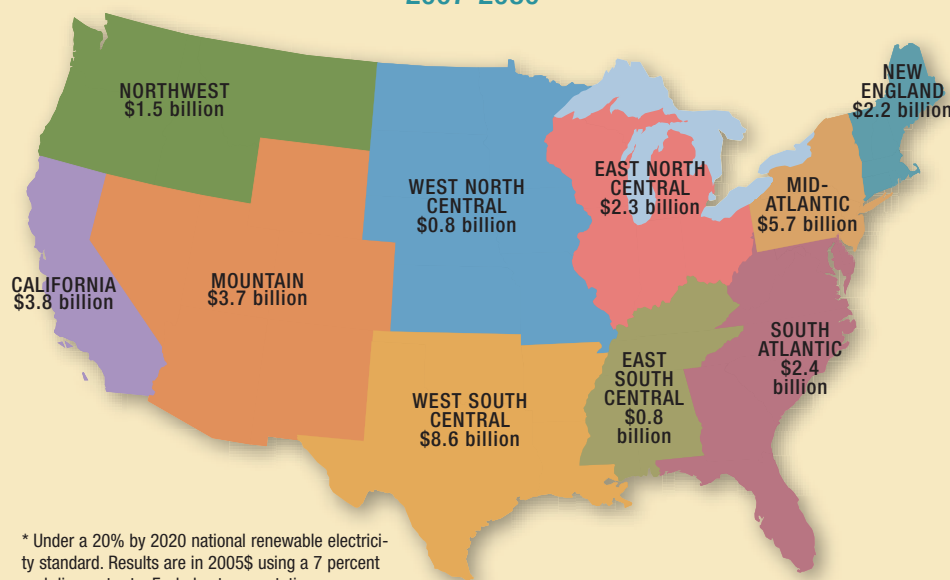


Many of the new jobs would be located in rural areas where the renewable energy generating facilities would be sited. However, a national standard can also benefit states with less abundant renewable resources by providing them the opportunity to manufacture and assemble components for renewable energy facilities. For example, based on an analysis by the Renewable Energy Policy Project completed for this study, we found that a 20 percent national standard would create 44,500 jobs in manufacturing components for wind turbines, solar photovoltaic panels and films, biomass facilities, and geothermal power plants, representing \$7.1 billion in new investment. Developing a strong manufacturing base can also create promising export opportunities, given the rapidly growing commitment of the rest of the world to expand renewable energy use.

In addition to creating jobs, a 20 percent by 2020 national standard would provide an important boost to the U.S. economy in the following ways:

- \$66.7 billion in new capital investment for renewable energy technologies
- \$25.6 billion in new income for farmers, ranchers, and rural

### Cumulative Natural Gas and Electricity Bill Savings\* by U.S. Census Region, 2007-2030



landowners who produce biomass energy and/or lease their land to wind developers

- \$2 billion in new property tax revenues to help local communities pay for schools and vital public services

### ENERGY DIVERSITY

In 2005, about 88 percent of our nation's electricity was generated from just three sources: coal, natural gas, and nuclear. This heavy reliance on fossil and nuclear fuels makes American consumers and the U.S. economy vulnerable to potential energy supply shortages and interruptions, as well as price spikes and price manipulation. Increasing our use of renewable energy helps diversify our energy mix by meeting a larger portion of U.S. power demand and reducing the projected growth in coal and natural gas use for electricity.

Our analysis found that under the UCS case 20 percent standard, America would increase its total homegrown renewable power generating capacity to 117,000 megawatts (MW) by 2020—more than twice as much compared with BAU and nearly six times the capacity levels in 2005 (about 20,000 MW). This development would come from wind, bioenergy, geothermal, and solar power resources, providing enough electricity to serve the needs of nearly 91 million typical U.S. homes. In addition, the renewable capacity needed to meet a 20 percent national standard is nearly 80 percent greater than what would be needed to achieve full compliance with existing state-level renewable electricity standards through 2020. After 2020, renewable energy development would continue to grow, with significant contributions from geothermal, solar thermal, and solar photovoltaics.

All regions of the country would see an increase in using local resources for

generation that would often displace the need for importing fossil fuel. By 2020, a 20 percent standard would also displace the need for up to 3.2 trillion cubic feet of natural gas and 476 million short tons of coal compared with BAU. To put this in perspective, the amount of coal saved would fill 46,000 miles' worth of coal railcars, which would circle nearly twice around the equator.

### A SMART CLIMATE SOLUTION

If left unchecked, heat-trapping emissions such as carbon dioxide (CO<sub>2</sub>) are expected to cause dangerous global warming that threatens our health and environment. Increased renewable energy use would provide an affordable global warming solution by reducing fossil fuel demand, thereby reducing CO<sub>2</sub> emissions from the largest U.S. source: power plants.

The 20 percent national standard would reduce power plant CO<sub>2</sub> emissions by 223 million metric tons per year by 2020 (8 percent below BAU and a 63 percent reduction in EIA's projected growth of power plant CO<sub>2</sub> emissions from today's levels), equivalent to taking 36.4 million cars off the road.

In addition to cutting CO<sub>2</sub> emissions, lower fossil fuel demand would reduce other harmful air pollutants from power plants such as mercury and sulfur dioxide, and would limit the damage done to our water and land by fossil fuel extraction and transport, conserving natural resources for future generations.

### BENEFITS UNDER THE EIA CASE

The EIA case 20 percent standard, which has relatively higher cost and worse performance assumptions for



Photos (top to bottom): Wind Capital Group; Warren Gretz, NREL; Craig Miller Productions and DOE, NREL; Pacific Gas & Electric, NREL.

## Comparison of Benefits, UCS and EIA Cases

most renewable energy technologies, would still provide significant—and in some instances, greater—consumer and environmental benefits (see table). For example, the EIA’s more optimistic cost projections for biomass technologies results in additional biomass development (and its associated benefits) compared with the UCS case. In addition, because the EIA projects more coal development under its BAU forecast, the EIA case 20 percent standard displaces a larger amount of coal generation, leading to more CO<sub>2</sub> emission reductions compared with the UCS case.

### A CLEANER, SAFER ENERGY FUTURE

A national renewable electricity standard would make America’s energy supply more reliable and secure. It would use local energy sources to create high-skilled U.S. jobs, improve local economies, put energy dollars back into the pockets of consumers, and reduce the dangers of global warming and air pollution. Using existing technologies, we can shift away from our dependence on an unstable, dirty fossil fuel supply, and toward a future built on clean, renewable energy. We have a responsibility and a com-

PELLING financial interest to make the renewable electricity standard a cornerstone of America’s national energy policy.



Photo: ©iStockphoto

	20% by 2020 UCS case	20% by 2020 EIA case
New capital investment in renewable energy	\$66.7 billion	\$43.4 billion
Consumer energy bill savings (through 2030)	\$31.8 billion	\$10.8 billion
Biomass energy payments	\$25 billion	\$34.1 billion
Property tax revenues	\$2 billion	\$1.5 billion
Wind power land lease payments	\$562 million	\$475 million
Natural gas savings	3.2 trillion cubic feet	2.6 trillion cubic feet
Coal savings	476 million short tons	644 million short tons
Annual CO <sub>2</sub> emission savings from power plants	223 million metric tons	310 million metric tons

### MODELING METHODS

UCS conducted its analysis using the EIA’s National Energy Modeling System. We examined the economic and environmental benefits under a 20 percent by 2020 standard using two scenarios. The “EIA case” assumes no changes to EIA’s model, while the “UCS case”:

- uses costs and performance assumptions for wind, coal, natural gas, and nuclear technology developed by Black & Veatch (a global engineering, consulting, and construction company) as part of a broad stakeholder process for the U.S. Department of Energy’s (DOE) National Wind Collaborative;
- uses costs and performance assumptions for solar, geothermal, and biomass technologies that are more in line with projections by the DOE’s Office of Energy Efficiency and Renewable Energy, and National Renewable Energy Laboratory; and
- takes into account recent cost increases from actual conventional and renewable energy projects.

We also evaluated the contribution made by states with renewable electricity standards that fully achieve their annual targets. (The EIA assumed that states will only achieve a fraction of their annual targets.)

#### ENDNOTES

- <sup>1</sup> H.R. 969, introduced by Representatives Tom Udall (D-NM), Todd Platts (R-PA), and 13 original co-sponsors.
- <sup>2</sup> Unless otherwise noted, results are presented in 2005 dollars using a 7 percent real discount rate.

A fully referenced version of this fact sheet is available online at [www.ucsusa.org/clean\\_energy](http://www.ucsusa.org/clean_energy).

The Union of Concerned Scientists is the leading science-based nonprofit organization working for a healthy environment and a safer world.



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