Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions
fact sheet

The Renewable Portfolio Standard

Frequently Asked Questions

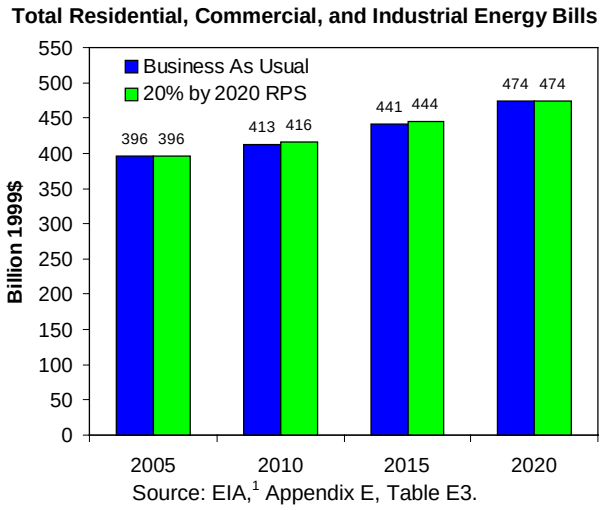
Is it feasible to supply 20% of US electricity with non-hydro renewable sources by 2020?

The United States is blessed by an abundance of renewable energy resources from the sun, wind, and earth. The *technical* potential of good wind areas, covering only 6% of the lower 48 state land area, could theoretically supply more than one and a third times the total current national demand for electricity. An area 100 miles square in Nevada could produce enough electricity from the sun to meet annual national demand. We have large untapped geothermal and biomass (energy crops and plant waste) resources. Of course, there are limits to how much of this potential can be used *economically*, because of competing land uses, competing costs from other energy sources, and limits to the transmission system. The important question is how much it would cost to supply 20% of our electricity from renewable energy sources other than hydroelectric power.

Can we afford to supply 20% of electricity with non-hydro renewable sources by 2020?

Recent studies have shown that an RPS of 20% by 2020 is easily affordable. A June 2001 study by the US Energy Information Administration (EIA)—using very high estimates of renewable energy costs—shows that an RPS of 20% by 2020 would cost roughly the same as business as usual through 2006 and only $2.8 billion or 0.7% higher in 2010.[1] By 2020, total bills would be $580 million (0.1%) lower with a 20% RPS. With ongoing natural gas savings after 2020, an RPS would likely produce net savings for consumers. Because an RPS creates a more diverse and competitive market for energy supply, EIA found that these market forces would reduce natural gas prices and bills, offsetting small electricity price. Other studies, using more realistic assumptions developed by the Department of Energy's Interlaboratory Working Group, consisting of the five national energy research labs, have found that a 20% RPS, when combined with energy efficiency programs, could save consumers billions of dollars.[2]

Figure 1. National RPS Cost - 20% by 2020

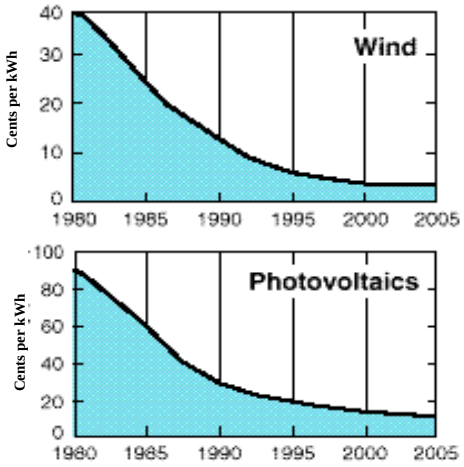


Source: EIA,[1] Appendix E, Table E3.

Aren't renewable energy technologies more expensive?

Renewable energy has made great strides in reducing costs, thanks to research and development and growth in domestic and global capacity. The cost for wind and solar electricity has come down by 80-90% over the past two decades (Figure 2).[3] The Electric Power Research Institute projects that the cost of renewable energy will continue fall to levels that are competitive with conventional energy sources over the next 5-15 years.[4]

Figure 2. Renewable Energy Cost Reductions



Source: DOE[3]

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Some wind power and geothermal facilities at the best sites are producing electricity for 3 to 6 cents per kilowatt-hour and are already competitive with other electricity sources. However, even when they cost somewhat more, renewable technologies can help stabilize prices because their fuel and operating costs are low, and because they create competitive pressure to restrain the price of fossil fuels. In addition, renewable energy sources do not impose the large costs to the environment and human health that fossil fuels do.

Why not let customers who want more renewable energy pay the extra costs?

Buying "green power" can help stimulate the market for renewable energy. But renewable energy provides environmental, fuel diversity, national security, and economic development benefits to everyone, not just to those who volunteer. Increasing renewable energy will reduce the risks to the economy posed by over-reliance on a single source of new power supplies, such as natural gas. A study by the National Renewable Energy Laboratory shows that by 2010 voluntary programs could increase renewable energy generation from 2% of electricity sales today to less than 3% of sales.[5] As discussed above, EIA and others have shown that an RPS of 20% of sales by 2020 would be achievable and affordable if everyone shares the cost. Surveys show that a large majority believes that everyone should share in the costs of increasing renewable energy. An RPS would create a minimum national standard that allows individuals who want to buy more renewable energy to do so.

Why not rely just on incentive-based approaches, such as tax credits?

Production tax credits are vital for leveling the tax playing field with fuel-intensive technologies that pay lower property taxes and can deduct fuel expenses, but do not necessarily overcome other critical market barriers. In order to ensure the tax credits are effective, there needs to be a policy that creates a market for the technologies. For example, the production tax credit for wind has produced most new wind capacity in states that also have a state RPS. (The tax credits also need to be extended for a long enough period for investors to rely on, expanded to include other renewable resources, and available to public power and rural electric cooperatives.) The RPS creates a market for renewable technologies that are commercially viable or close to viable and helps reduce their costs (see below). Other complementary policies, including net metering and other financial incentives, are also needed to encourage the development of higher cost renewable emerging technologies with significant long term potential such as customer-sited solar photovoltaics.

How does the RPS reduce renewable energy costs?

The RPS is the best policy to ensure we meet resource diversity and environmental goals at the lowest cost. By stimulating a long-term market for renewable energy, the RPS reduces the investment risk associated with building renewable facilities. Lower investment risk promotes cost-effective financing of new projects. Increasing the deployment of renewable technologies reduces manufacturing, installation, maintenance, and other costs over the long term. At the same time, competition among a variety of renewable sources to meet the RPS also helps drive renewable energy prices down. Using renewable energy credits (see below) creates additional savings.

What are renewable energy credits and why should credit trading be used to meet an RPS?

A system of tradable renewable energy credits (RECs) provides electricity generators with a simple and flexible means for achieving renewable energy targets. One REC is created for every unit of renewable electricity generated. Renewable energy generators earn RECs and then sell them to those who need them to meet the RPS requirements. A national RPS with RECs trading will reduce the cost of renewable energy technologies by creating a national market for the most cost-effective renewable

energy sources. This approach is very similar to the successful credit-trading program established for sulfur dioxide emissions under the Clean Air Act.

Should hydropower qualify for the RPS?

Hydropower is a mature technology, as it comprises approximately 10% of our nation's current supply of electricity. It is often the least expensive generation available, and existing hydro facilities generally do not need the support of an RPS to continue operating. There are also only limited opportunities for environmentally sensitive expansion of hydropower generation. Some proposed approaches would allow incremental hydroelectric generation at existing dams to qualify for an RPS.

Renewable sources like solar and wind have variable output. Would an RPS affect the reliability of the energy system?

The electric system is designed to handle unexpected swings in energy supply and demand, such as significant changes in consumer demand or even the failure of a large power plant or transmission line. There are several areas in Europe, including Spain, Germany, and Denmark, where wind power already supplies over 20% of the electricity with no adverse effects on the reliability of the system. Several important renewable energy sources, such as geothermal, biomass, and landfill gas systems can operate around the clock. Studies by the EIA[6] and the Union of Concerned Scientists[7] show these renewable plants would generate over half of the nation's non-hydro renewable energy under the 20% RPS in 2020. Renewable energy can increase the reliability of the overall system, by diversifying our resource base and using supplies that are not vulnerable to periodic shortages or other supply interruptions. Solar energy is also generally most plentiful when it is most needed—when air-conditioners are causing high electricity demand.

How would the RPS affect national energy security?

Much of the US energy system—power plants, dams, refineries, pipelines, tankers, and the electricity transmission grid—presents significant safety and security risks. Renewable energy facilities are small, geographically dispersed, and do not require transporting or storing radioactive or combustible materials. Increasing renewable energy would reduce the number of vulnerable facilities over time. Renewable energy can also reduce the need to expand imports of liquefied natural gas (LNG). LNG imports from non-NAFTA countries, including OPEC members—Algeria, Indonesia, Iran, Nigeria and Qatar—are projected to grow from less than 1% of gas supply today to up to 12% by 2010. Renewable fuels can also displace oil. Among the experts calling for a federal RPS to increase energy security are James Woolsey, former head of the CIA, Robert McFarland, former national security advisor to President Reagan, and Admiral Thomas Moorer, former head of the Joint Chiefs of Staff.

We've spent billions subsidizing solar and wind and they still aren't competitive. Is it time to look elsewhere?

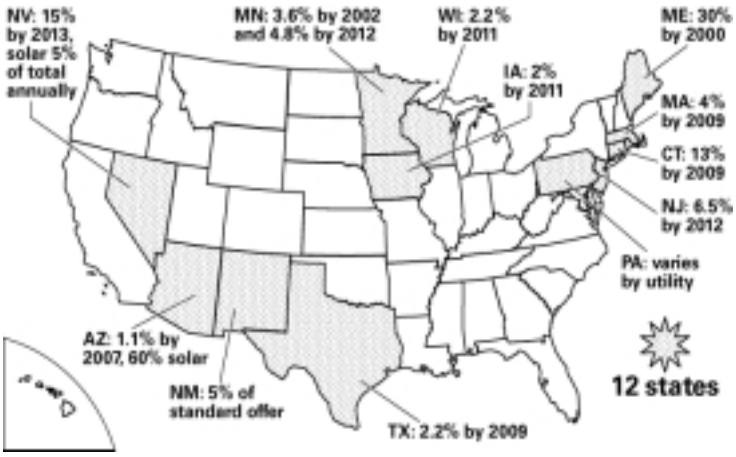
As discussed above, DOE investments in R&D and state and federal incentives have reduced the cost of renewable energy generation as much as 80-90%. But renewable energy technologies still do not compete on a level playing field with conventional energy sources. Federal subsidies for renewable energy have been and continue to be much less than government subsidies for the fossil fuel and nuclear power industries.[8] A recent study by the Renewable Energy Policy Project showed that between 1943 and 1999, the nuclear industry received over $145 billion in federal subsidies vs. $4.4 billion for solar energy and $1.3 billion for wind energy.[9] Another study by the non-partisan Congressional Joint Committee on Taxation projected that the oil and gas industries would receive an estimated $11 billion in tax breaks and loopholes that subsidize exploration and production activities between 1999 and 2003.[10] Legislation passed by the House of Representatives in 2001 (H.R. 4) would

authorize as much as $38 billion over ten years in new and expanded subsidies for the oil, coal, gas, and nuclear power industries.

Would we have to restructure the electricity industry in order to adopt an RPS?
No. An RPS is compatible with both a regulated or restructured industry. Iowa, Minnesota, and Wisconsin adopted renewable energy requirements outside of restructuring. Nevada adopted a small RPS during restructuring, but greatly expanded it later. Eight other states, including Texas, have enacted an RPS during restructuring. (Figure 3).

Why not rely just on emission caps and trading programs to meet environmental goals?
Emission cap and trading programs are critical for reducing harmful pollution from power plants. But they do not necessarily help new technologies that provide long-term benefits overcome market barriers. An EIA study found that a 20% RPS would reduce the cost to consumers of meeting four-pollutant reductions from power plants by $4.5 billion in 2010 and $31 billion in 2020 compared to meeting the emission reductions without an RPS.[11] By providing additional alternatives to switching from coal to natural gas, renewable energy sources restrain price increases in natural gas to power plants and other users.

Figure 3. States with Renewable Portfolio Standards



Source: UCS

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.

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[1] Energy Information Administration, *Analysis of Strategies for Reducing Multiple Emissions from Electric Power Plants: Sulfur Dioxide, Nitrogen Oxides, Carbon Dioxide, and Mercury and a Renewable Portfolio Standard*, SR/OIAF/2001-03, June 2001. http://www.eia.doe.gov/oiaf/servicerpt/epp/pdf/sroiaf(2001)03.pdf

[2] For more detail, see UCS Fact Sheet: "EIA Study: National Renewable Energy Standard of 20% is Easily Affordable." http://www.ucsusa.org/energy/

[3] U.S. Department of Energy National Laboratory Directors, *Technology Opportunities to Reduce U.S. Greenhouse Gas Emissions*, October 1997. http://www.ornl.gov/climate_change

[4] Electric Power Research Institute and the US Department of Energy, *Renewable Energy Technology Characterizations*, EPRI-TR-109496, December 1997. http://www.eren.doe.gov/power/techchar.html

[5] Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, *Forecasting Growth of Green Power Markets in the United States*, NREL/TP-620-30101, LBNL-48611, October, 2001. http://www.eren.doe.gov/greenpower/pdf/30101.pdf

[6] Energy Information Administration, *ibid*.

[7] Union of Concerned Scientists, *Clean Energy Blueprint: A Smarter National Energy Policy for Today and the Future*, October 2001. http://www.ucsusa.org/energy/blueprint.html

[8] Doug Koplow and John Dernbach, "Federal Fossil Fuel Subsidies And Greenhouse Gas Emissions: A Case Study of Increasing Transparency for Fiscal Policy," *Annual Review of Energy and Environment*, 2001. 26:361–89. http://energy.annualreviews.org/cgi/content/full/26/1/361?ijkey=2zGcFva7fLEMA&keytype=ref&siteid=arjournals

[9] Goldberg, Marshall, *Federal Energy Subsidies: Not All Technologies are Created Equal*, Renewable Energy Policy Project, July 2000, http://www.repp.org/articles/resRpt11/subsidies.pdf.

[10] Joint Committee on Taxation, *Estimates of Federal Tax Expenditures for Fiscal Years 1999-2003*, 1998.

[11] Energy Information Administration, *ibid*.