

Alternate power

States lead the movement toward renewable energy sources

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Efforts to increase the use of renewable energy in the United States have drawn little attention over the last decade, but recent events are providing evidence of a shift in policy that would enhance the use of alternative sources.

The terrorist attacks of Sept. 11, 2001, resulted in a growing interest in reducing the United States' reliance on foreign oil reserves. State officials are expressing concerns over the transportation and storage of nuclear waste, and the environmental consequences of coal and oil exploration. Both the Federal Energy Regulatory Commission and the U.S. Congress are considering proposals that would enhance the role of renewables in electricity production. States are developing policies and incentives to assist in the commercialization of renewable energy.

Transforming to a 'super' grid

In order for any renewable energy project to be successful, it must be able to connect to the electrical grid and sell power. These suppliers can also be consumers (referred to as net metering). The current electric power system is designed for one-way power flow, where power is transmitted from a central generating plant to the consumer. This configuration becomes more complicated with the introduction of power from thousands of systems into the grid.

A transformation of this huge, centralized power system to a "super-grid" that accommodates smaller, distributed energy systems will be necessary. This will require more sophisticated technologies



Solar energy, tapped from panels on buildings, is one of the more well-known alternative energy sources.

and standards for the operation and safety of interconnections between distributed resources and existing electric power systems. Currently, connectivity standards vary widely. Many electrical-grid operators have rules that make connection or sale by intermittent power sources difficult. According to E3 Energy, these disparate rules mean that distributed generation systems have higher costs because they must be custom-designed for each utility. New rules proposed by FERC are designed to provide fair access for power generators.

Efforts are underway in several states to facilitate the deployment of renewable sources of energy. Some approaches employed by states to promote renewable energy development include Renewable Portfolio Standards (RPS), net metering regulations, public benefit funds and financial incentives.

- **Renewable Portfolio Standards.** Thirteen states have implemented RPS. This flexible, market-based

policy requires that a certain percentage of a utility's generating capacity or sales come from renewable sources. Utilities can use a variety of sources to meet this obligation: They can generate the renewable electricity themselves; they can purchase from another generator; or they can purchase credits from others who have exceeded the standard. The important point is that utilities can choose the option. RPS, coupled with state and federal subsidies, have been credited with making Texas one of the leading wind producers in the country. Texas' RPS called for new renewable-capacity targets of 400 megawatts by 2005 and 2,000 megawatts by 2009. Currently, Texas has over 1,000 megawatts of wind power installed, putting it well ahead of schedule. Similarly, Nevada's RPS mandates that 15 percent of the state's electricity come from renewable sources by 2013.

- **Net metering.** Regulations permitting customers who generate electricity using renewable sources to sell excess energy back to their local utility have been adopted by thirty-five states. Net metering involves a single, bidirectional meter that tracks the flow of electricity both to and from the customer. Most states place a limit on the amount of electricity that can be sold back to the utility, usually under 25 kilowatts for residential units and under 100 kilowatts for commercial and agricultural units. Ohio and Iowa do not have a size limit, but California has set its limit at 1000 kilowatts, enough to power over 200 homes.
- **Public benefits funds.** Fifteen states have developed state-level renewable energy programs that use a systems benefits charge to support public benefit funds, which invest in renewable technologies. The charge is usually very small and applied to all customers based on energy consumption. Typically, public benefits funds support four key areas: low-income energy assistance, energy efficiency improvements, renewable energy development and clean energy research and development. California has the highest level of funding, around \$135 million per year. By 2012, these funds will generate more than \$4 billion for the development of renewable energy.
- **Financial incentives.** States have employed a number of financial incentives to help stimulate the renewable market. Some states see the renewable energy industry as essential to their economic development and have developed industrial recruitment plans offering incentives. Michigan created the NextEnergy Zone, a 700-acre, state-owned economic development area for renewable energy. In Gov. John Engler's announcement, he exemplified how political leaders attitudes toward renewable energy are beginning to shift, saying the state's goal is to accelerate the commercialization of these technologies and become the world headquarters for renewable energy. Ohio established

similar goals when Gov. Robert Taft revealed the state's Third Frontier Project, a 10-year, \$1.6 billion plan to promote high-tech research. Over three years, \$100 million will go toward making Ohio a leader in fuel cells. Other states are focusing on biomass and rural development opportunities.


Renewable biomass fuels such as poultry litter, switchgrass and corn used to co-fire electrical generators provide value-added market opportunities for farmers and economic development options for rural communities. The U.S. Department of Agriculture has estimated that biomass fuels could replace half of the nation's gasoline consumption and that 17,000 jobs are created for every billion gallons of ethanol produced. Corn-derived ethanol is blended with gasoline at levels of between 5 percent and 85 percent, and diesel from soy or animal fat is also available. Marketing of corn and soybeans through ethanol or diesel production increases the demand and the value of our nation's top row crops.

The Chariton Valley Biomass project, funded by the U.S. Department of Energy, IES utilities and Iowa State University, currently uses switchgrass from over 4,000 acres of Iowa farmland with coal for co-firing a generator. Producing from 3 to 5 tons of switchgrass per acre provides an income of up to \$200 per acre for farmers.

In California, a number of incentives exist as part of the state's continued efforts to increase biomass usage for power. Gov. Gray Davis has offered \$11 million in grants to encourage farmers to take part in the conversion of agriculture biomass to energy. Landfills using gas to produce electricity have access to over \$600,000 in incentive funds. California is also a part of a multi-state effort to develop a small, modular generator able to use a variety of biofuels. Inland Empire Utilities Agency in Chino is converting manure from 3,700 dairy cows into 210,000 cubic feet of biogas per day. This fuels the generation of 500 kilowatts of energy per day. Not only is this project an environmental success, preventing four tons of salts and nitrates from entering the watershed daily, it also produces 135 tons of organic fertilizer and is economically sound.

Iowa milk producer Roger Decker is using the manure from his cows to generate 130 kilowatts of electricity, enough to power 20 homes per day.

Even wind power creates value-added markets for rural communities. In addition to lease payments for wind generators, some communities report increases in tourism dollars when tour groups visit "wind farms."

New technology is bringing renewable energy closer to being economically competitive with conventional alternatives. Government involvement – on both the state and federal levels – will be a necessary catalyst to drive the movement forward. 

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Federal energy bill

In September, the differences between House and Senate energy legislation were still being resolved in conference. Senate Energy and Natural Resources Chair Jeff Bingaman (D-NM) and House Energy and Commerce Committee Chair Billy Tauzin (R-LA) are overseeing the Conference Report. The Senate included a Renewable Portfolio Standard requiring 10 percent of a utility's energy come from renewable resources, while the House version did not include this provision. Other differences involve tax credits for wind- and wood-burning energy sources. While both versions extend the 2003 deadline for a 1.5-cent per kilowatt-hour tax credit, the versions differ on the dollar amount of the tax break. Also under consideration is a requirement for the federal government to derive 7.5 percent of its energy from renewable resources by 2010.