



TEXAS PUBLIC POLICY FOUNDATION
LEGISLATORS' GUIDE TO THE ISSUES

Wind Energy

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THE ISSUE

Wind, water, biomass, and the sun are the oldest energy sources used by mankind. The inherent limitations of these sources motivated people to seek more efficient and reliable fuels to power society.

The peak use of windmills was in the 1930s and 1940s. Farmers stopped using them because rural electrification provided electric power far more reliable and often less expensive than wind. Yet today we are turning back to this expensive and inefficient energy source because of government mandates and subsidies, which are driving up electricity costs for Texas consumers.

In March 2010, Texas met the Renewable Portfolio Standard 15 years earlier than required by state law. With almost 10,000 megawatt (MW) of installed capacity for wind, Texas leads all other states. With an installed capacity of 781 MW, the Roscoe Wind Farm in Texas is the largest in the world. The PUCT orders to construct hundreds of miles of new transmission lines for wind make the Texas Competitive Renewable Energy Zone (CREZ) project the world's biggest expenditure on renewable energy. The PUCT estimates the cost for CREZ at around \$5 billion, a cost already on the rise and which will be added to electric rates for all ERCOT customers.

Wind may be free and without emissions, but the same is not true for electricity *generated* from wind. Texas consumers should consider the many hidden costs of wind power,

increasing costs that over time may not be sustainable, as several European countries already have learned.

Subsidies for wind are one source of these costs. Although most energy sources receive some government subsidies, the subsidies for renewable energy sources are far higher on a per unit of production basis than traditional sources of energy. At \$23.37 per MW hour, wind receives 100 times the federal money that natural gas generation receives. The federal government provides hundreds of billions for renewable energy projects, including grants for 35 percent of construction cost. A wind farm in south Texas recently received a check for \$113 million to double the size of an existing facility. Un-sustainable deficits forced Spain, Germany, and Denmark—global trailblazers in renewable energy—to dramatically cut taxpayer funded subsidies for renewable power.

Texas subsidies today also favor renewable fuels, certainly on a per unit of production basis. The majority of Texas-based subsidies for wind are indirect subsidies, often hidden from view and hard to account for. One major cost of wind is the integration of wind into the electric grid. Because of the intermittency and variable speed of wind, wind generation requires continual back-up generation to replace wind on the grid at a moment's notice. In a report compiled for Ontario (Canada) electricity consumers, Keith Stelling wrote, "Energy experts report that industrial wind power is proving to be exceptionally expensive to consumers once required backup and additional infrastructure are factored in."

Federal Financial Interventions and Subsidies in Energy Markets 2007

Fuel	FY 2007 Net Generation (billion kWh)	Subsidy & Support Value (million dollars)	Subsidy & Support Per Unit of Production (dollars/MWh)
Solar	1	\$14	\$24.34
Wind	31	\$724	\$23.37
Nuclear	794	\$1,267	\$1.59
Geothermal	15	\$14	\$0.92
Biomass (and biofuels)	40	\$36	\$0.89
Hydroelectric	258	\$174	\$0.67
Coal	1,946	\$854	\$0.44
Natural Gas & Petroleum Liquids	919	\$227	\$0.25

Source: Energy Information Administration

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Stelling attributes the high cost to (1) the need to maintain backup generating reserve to cover times when the wind does not blow, (2) the need to stabilize the grid when wind produces power that is not needed by current demand, and (3) government subsidization and tax benefits for the wind industry.

Typically, natural gas-fired generating units are used in an interruptible mode similar to idling a car. The cost of back-up generation is a hidden and wasteful cost of wind power.

The long distance of wind generation from population centers has also led to large subsidies through the construction of the Competitive Renewable Energy Zone (CREZ) transmission lines. To date, the CREZ lines are Texas' largest subsidy for renewable energy—though integration costs may soon surpass them. The cost to build the CREZ transmission lines will be directly added to the bill of every electricity consumer in ERCOT. While this same process is true of all transmission built in Texas, it is proper to characterize these costs as subsidies for renewable energy—particularly wind—because these lines are being built to where there is little other generation except wind. And that is likely to remain the case. Initial implementation of CREZ transmission has caused intense opposition from thousands of landowners. Transmission service providers anticipate thousands of eminent domain proceedings.

Another hidden cost stems from line loss. The hundreds of miles of transmission through the CREZ lines can mean line loss of roughly 10 percent. The amount of transmission capacity needed for wind power is similarly inefficient. Wind has major limitations because of its inherent intermittency. Texans will have far less electricity actually generated by wind turbines than the 10,000 MW of installed capacity. ERCOT calculates the summer peaking “capacity factor” of Texas wind farms at 8.7 percent of installed capacity. In 2007, wind accounted for 4.4 percent total installed generating capacity in Texas but only 2.2 percent electric generation. The U.S. Department of Energy estimates a national average capacity factor for wind at 30 percent of installed capacity.

Yet to utilize wind when it does blow, transmission must be available for the full rated output of wind turbines. The turbine blades, however, rarely turn at full capacity. Thus, the huge cost Texans will pay for the new CREZ transmission lines may be far higher per unit of generation than from coal, gas, or nuclear fueled power.

A major problem with most of these costs for wind is that they are not paid for by the investors in wind generation—as

in the case of generation from traditional sources, but by consumers and taxpayers.

THE FACTS

- ★ The Texas Renewable Portfolio Standard (RPS) mandates 5,880 MW renewable capacity by 2015; 10,000 MW by 2025 and 500 non-wind by 2025.
- ★ Subsidies for Texas wind energy through the federal Production Tax Credit should cost taxpayers about \$300 million in 2010.
- ★ The cost of wind Renewable Energy Credits—perhaps \$41 million this year—are passed on to consumers through the price of electricity.
- ★ CREZ transmission lines—being built to transmit electricity from wind in West Texas—will add as much as \$1.3 billion annually to electricity bills once the lines have been completed.
- ★ The backup generation and grid-related costs of wind energy could increase ERCOT's system production costs by \$1.82 billion per year.

RECOMMENDATIONS

- ★ Eliminate the Renewable Portfolio Standard.
- ★ Require wind, solar, and other renewable generators to meet the same standards as other generators.

RESOURCES

A Tale of Two Markets: Telecommunications and Electricity: A Sunset Report on the Texas Public Utility Commission by Bill Peacock, Texas Public Policy Foundation (May 2010) <http://www.texaspolicy.com/pdf/2010-05-RR06-PUCSunset-bp.pdf>.

Texas Wind Energy: Past, Present, and Future by Drew Thornley, Texas Public Policy Foundation (Sept. 2008) <http://www.texaspolicy.com/pdf/2008-09-RR10-WindEnergy-dt-new.pdf>.

The True Cost of Wind Energy by Bill Peacock, Texas Public Policy Foundation (Oct. 2008) <http://www.texaspolicy.com/pdf/2008-10-PP18-truecostofwind-bp.pdf>. ★

