

WIND POWER AND CLIMATE CHANGE



Wind: Electricity without Emissions

There is no need to wait for a climate solution. Wind power is one of only a few near-term options to reduce emissions. In a May 2008 study, the U.S. Department of Energy concluded that "Wind energy...can be widely deployed across the United States and around the world to begin reducing greenhouse gas emissions now." Wind energy is already clearing the air and protecting the planet: In 2007, nearly 17,000 megawatts of clean generation provided by U.S. wind power prevented the emission of approximately 28 million tons of CO₂. Wind power offers time to allow for development and commercialization of emerging clean technologies, as well as construction of other clean power options with longer lead times.

How wind helps reduce global warming

- Electricity generation is the largest industrial source of air pollution in the U.S.; demand for electricity continues to grow.
- The United States produces 6,000 million metric tons of carbon dioxide annually. By 2030 this will reach 7,000 million metric tons. Forty percent of CO₂ comes from the electric power sector.
- Wind power generates no emissions, and displaces carbon and other greenhouse gases that would otherwise be emitted by fossil fuel-fired electric generation.
- In 2007, the clean generation provided by wind displaced the emissions of approximately 28 million tons of carbon dioxide.

How much can wind help fight global warming?

Looking at a scenario of 20% wind energy by 2030, the Department of Energy recently reported wind energy could avoid 825 million tons of CO₂ annually by 2030, 25% below expected electric sector emissions by 2030. This is equivalent to taking 140 million vehicles off the road.

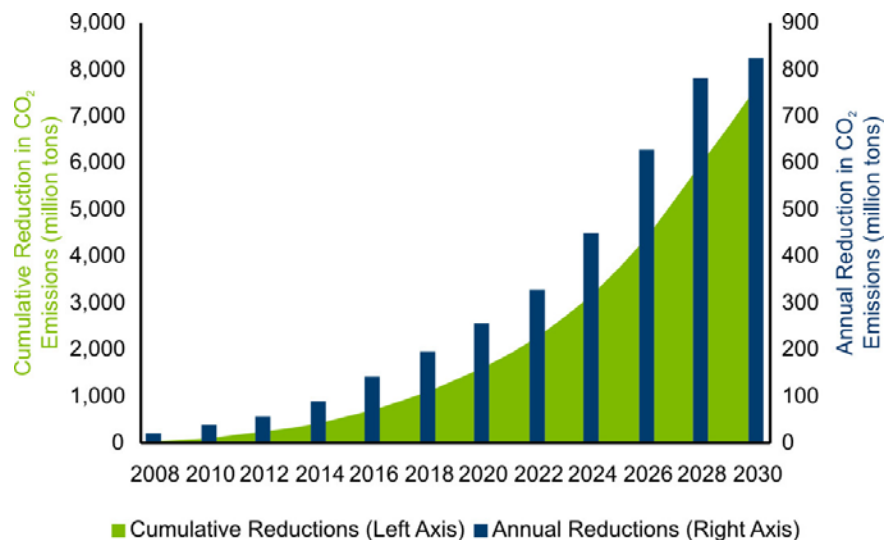
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CUMULATIVE AND ANNUAL EMISSION REDUCTIONS
UNDER A 20% WIND SCENARIO BY 2030



The long-term climate benefits of significant wind power

In May 2008 the U.S. Department of Energy released a study¹ of the feasibility of generating 20% of U.S. electricity needs from wind power by 2030. DOE determined that achieving this level of wind generation is feasible, no technological breakthroughs are required and it would have significant environmental benefits:

- Supplying 20% of U.S. electricity from wind could reduce annual electric sector CO₂ emissions by 825 million metric tons in the year 2030.
- The cumulative effect of achieving 20% by 2030 would be to reduce emissions by 7,600 million metric tons, rising to 15,000 million tons by 2050, equivalent to taking 140 million cars off the road,
- Using wind to generate 20% of U.S. electricity will almost single-handedly keep electric sector emissions from increasing despite dramatically increased demand.
- The 20% scenario would displace 50% of electricity generated from natural gas and reduce natural gas consumption across all industries by 11%, alleviating pressure on gas markets and electricity prices.
- The 20% wind scenario would displace 18% of electricity generated by coal, eliminating the need to build more than 80 gigawatts of new coal capacity.
- It would reduce cumulative water consumption in the electric sector by 8%, or 4 trillion gallons, by 2030 with nearly 30% of the savings occurring in western states where water is particularly scarce.

A related study concluded² that the 20% wind scenario would reduce natural gas costs to consumers by up to \$214 billion and would lower the cost of compliance with climate legislation by up to \$145 billion.

Wind power is already reducing greenhouse gases

- To generate the same amount of electricity as today's U.S. wind turbine fleet (16,818 MW) would require burning 23 million tons of coal (a line of 10-ton trucks over 9,000 miles long) or 75 million barrels of oil *each year*
- Even emissions from the manufacture and installation of wind turbines are negligible. The "energy payback time" (a measure of how long a power plant must operate to generate—"pay back"—the amount of electricity required for its manufacture and construction) of a wind project is 3 to 8 months, depending on the wind speed at the site – one of the shortest of any generation technology.
- A study by the Midwest Independent System Operator (MISO) showed that 16,000 MW of additional wind capacity would avoid 43 million tons of CO₂, or approximately 1,300 pounds of CO₂ for every megawatt-hour of wind generation.³

Climate change legislation should take full advantage of wind energy

Climate change legislation offers a significant opportunity to expand our nation's reliance on wind energy and make a significant down payment on emissions reductions. If properly crafted, such legislation will send price signals to invest in clean, renewable resources like wind power both in the near-term and long-term. To be most effective in promoting wind power, climate change legislation should financially recognize the emission reduction contribution from renewable energy; create a strong, direct, and stable market price signal; address transmission infrastructure needs; and help expand domestic manufacturing and worker training for renewable energy industries.

1. 20% Wind Energy by 2030, U.S. Department of Energy (2008) <http://www.20percentwind.org>

2. Power System Modeling of 20% Wind-Generated Electricity by 2030, NREL (2008) <http://www.nrel.gov/docs/fy08osti/42794.pdf>

3. *Transmission Expansion Plan, Vision Exploratory Study*, Midwest ISO (2006) <http://www.midwestiso.org/page/Expansion+Planning>