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Invest In Wind Energy

In 2008 the US government showed that wind has the potential to deliver 20% of the US's power by 2030, using 300 GW of turbines. This certainly underestimates what's possible, as it did not assume the use of European-style feed-in tariffs to accelerate progress; or the potential for greater efficiency, rising gas prices or the arrival of carbon pricing for coal- and gas-fired power.

The goal laid out in Solution #51 of generating 25% of the US's energy from the wind (1,250 TWh) would require the construction of 625 GW of capacity,¹ using 5% of the 12,000 GW potential. It would create 2.5 million high-paying jobs,² while requiring a density of turbines on the land

An acre of windy prairie could produce between \$4,000 and \$10,000 worth of electricity per year — which is far more than the value of the land's crop of corn or wheat.

— Denis Hayes

similar to Denmark's. Germany produces 34 times more wind energy per square mile than the US, and enjoys 80,000 high-paying wind energy jobs.

By the end of 2008, the US had developed 25,300 MW, representing 0.2% of its potential, which is to produce far more, mostly in the open farmland of the mid-west from the Canadian border to the Gulf of Mexico.³ This would bring hundreds of thousands of jobs to the region and enormous income to the farmers, at prices that would be consistently cheaper than electricity from both coal and gas with a carbon price attached. It would also preserve the enormous volume of water that coal-fired electricity requires.

At \$2 million per MW, the \$1.25 trillion investment would be similar in the long term to the cost of new gas-fired or nuclear power plants, both of which will see rising fuel prices during their operational lives, while wind will always blow for free. It is for this reason that utilities such as Xcel Energy like the wind, because it provides a useful hedge against future fuel price volatility.

Studies show that wind energy can integrate well into the grid, despite being an intermittent source of power. In 2008 Denmark received 25% of its energy from the wind, chasing a goal of 50%. Spain, which gets 9% of its energy from the wind, had a period in March 2007 when the wind was producing 27% of its power. At 20% there is almost no additional cost for firming up the power, and even at 25% the cost for storage and firming is only half a cent per kWh.⁴

The greater the geographic distribution of the turbines, the smaller the chance that they will be



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A wind farm in western Canada.

- 20% Wind Energy by 2030: 20percentwind.org
- American Wind Energy Association: awea.org
- Canadian Wind Energy Association: canwea.ca
- Public Renewables Partnership: repartners.org
- Utility Wind Integration Group: uwig.org
- Wind Powering America: windpoweringamerica.gov
- Windustry: windustry.org

windless at the same time, and changes in the wind are never instantaneous, unlike the sudden forced outages with large conventional plants. Modern wind forecasting tools warn system operators about likely changes up to an hour ahead, giving them ample time to prepare.

In 2008, a study found that the US could theoretically replace 100% of its carbon-emitting pollution (assuming the use of electric vehicles) with up to 645,000 giant 5 MW wind turbines, requiring just 13 sq km for their footprints, and 3% of the US landmass for their spacing area.⁵

Canada's Windy Future

In its 2008 report, *Windvision 2025*, the Canadian Wind Energy Association found that wind energy could generate 20% of Canada's electricity demand by 2025, as called for in Solution #51, adding 55 GW of capacity and generating 52,000 full-time green-collar jobs. With such a large landmass, Canada could easily become a major wind energy exporter if the US moves too slowly in its own development. In Quebec alone, a 2004 study found more than 100 GW of wind potential in sites within 25 km of Hydro Quebec's transmission lines.⁶

US Wind Potential

State	Wind Potential MW ⁷	Installed, 2008 MW	% Potential Installed
North Dakota	138,400	344	0.25%
Texas	136,100	7,118	5%
Kansas	121,900	465	0.4%
South Dakota	117,200	98	0.08%
Montana	116,000	165	0.14%
Nebraska	99,100	73	0.07%
Total USA ⁸	12,000,000	25,300	0.21%

Lobby for the Best Policies

For this much energy to be produced, wind-producing companies, utilities, farmers and cooperatives must work with local advocacy organizations and politicians to overcome the obstacles and win approval for policies that support the goal, including legislated targets, feed-in tariffs, federal agency purchasing requirements, investment in R&D, and the grid extensions that will be needed to bring the power to the cities.⁹

Wind Power Development around the World

	Square miles	MW wind 2008	KW wind per square mile
Denmark	16,627	3,125	188
Germany	137,742	22,000	160
Spain	194,883	11,000	56
Texas	262,017	5316	20
USA	3,615,123	25,300	7
South Dakota	75,952	98	1.3