



Wind energy systems have low operating expenses because they have no fuel cost. Photo by Jenny Hager Photography/PIX15990

# Wind Energy Benefits

## 1. Wind energy is cost competitive with other fuel sources.

Power purchase agreements are now being signed in the range of 5 to 6 cents per kilowatt-hour,<sup>i</sup> a price that is competitive with new gas-fired power plants.<sup>ii</sup> Researchers expect continued cost reductions as the technology improves and the market develops.

## 2. Wind energy creates jobs.

Wind energy development creates thousands of long-term, high-paying jobs in fields such as wind turbine component manufacturing, construction and installation, maintenance and operations, legal and marketing services, transportation and logistical services, and more. In 2010, the wind sector invested \$10 billion in the U.S. economy and employed 75,000 workers. In the same year, 31 manufacturing facilities opened or were announced. According to the American Wind Energy Association, employment in the wind industry's manufacturing sector has increased from 2,500 jobs in 2004 to 20,000 in 2010, with an estimated additional 14,000 manufacturing jobs planned.<sup>iii</sup> (Policy decisions will affect this number.)<sup>iv</sup>

## 3. Wind energy is an indigenous, homegrown energy source that helps to diversify the national energy portfolio.

The United States is the world's largest importer of oil<sup>v</sup> and natural gas.<sup>vi</sup> Our reliance on imports threatens our national economic security. Adding wind power to the energy mix diversifies the national energy portfolio and reduces America's reliance on imported fossil fuels. In addition to bolstering the security of our national energy supply, wind energy stabilizes the cost of electricity and

reduces vulnerability to price spikes and supply disruptions. With the expanded use of electric and plug-in hybrid vehicles, wind energy can also reduce our dependence on imported transportation fuels.

## 4. Wind energy can provide income for rural farmers and ranchers, as well as economic benefits to depressed rural areas.

Wind projects provide revenue to the communities in which they are located via lease payments to landowners, state and local tax revenues, and job creation. Even a utility-scale wind turbine has a small footprint, enabling farmers and ranchers who lease their land to developers to continue growing crops and grazing livestock. Achieving 20% wind energy by 2030 would provide significant economic benefits, including more than \$8.8 billion in estimated property taxes and land lease payments between 2007 and 2030.<sup>vii</sup> Rather than paying for energy imported from other states, this money stays in the community.

## 5. Wind energy is an inexhaustible renewable energy source.

Wind energy is plentiful and readily available, and capturing its power does not deplete our natural resources. The Great Plains and offshore areas have tremendous untapped wind energy potential.

## 6. Wind turbines do not consume water.

Most electric power plants require water to operate, and water use in drought-stricken areas like the western United States is a significant issue. Producing electricity from the wind does not require water. Achieving a 20% wind energy by 2030 scenario would reduce cumulative water use in the electric sector by 8%, or 4 trillion gallons.<sup>viii</sup>

## 7. Wind energy is clean.

Electricity generated by wind turbines does not pollute the water we drink or the air we breathe, so wind energy means less smog, less acid rain, and fewer greenhouse gas emissions. A single 1-megawatt wind turbine can displace 1,800 tons of carbon dioxide (CO<sub>2</sub>) in 1 year (equivalent to planting 1 square mile of forest).<sup>ix</sup> Achieving 20% wind energy by 2030 would provide significant environmental benefits, such as avoiding approximately 825 million metric tons of CO<sub>2</sub> emissions in the electric sector.<sup>x</sup> Because it is a clean energy source, wind energy reduces health care and environmental costs associated with air pollution.

## 8. Wind energy systems have low operating costs.

Wind energy systems have low operating expenses because they have no fuel cost. When large amounts of wind energy are added to the grid, additional generation may be required to accommodate wind energy's variability, but the Utility

Wind Integration Group concluded that system operating cost increases from wind variability and uncertainty amounted to only about 10% or less of the wholesale value of the wind energy and that there are ways to reduce these costs.<sup>xi</sup> The absence of fuel cost also protects consumers from fluctuating coal and natural gas costs.

## 9. Wind energy can be used in a variety of applications.

Wind turbines can be used in applications other than utility-scale wind farms. Community wind projects include turbines for schools, tribes, municipal utilities, and rural electric cooperatives. Small wind turbines, alone or as part of a hybrid system, can power homes, businesses, farms, ranches, and schools. Wind energy is perfect for remote applications, such as water pumping, ice making, powering telecommunications sites, and displacing diesel fuel in remote communities.

## 10. Wind energy is one of the most popular energy technologies.

Over the past 10 years, cumulative wind power capacity in the United States increased an average of 30% per year, slightly higher than the 28% growth rate in worldwide capacity.<sup>xii</sup> Wind energy was the most frequently installed energy technology on a capacity basis of any technology in the United States in 2008 and 2009.<sup>xiii</sup>

Because of all the benefits listed above and more, many opinion surveys show that the majority of people are in favor of wind energy. In Nebraska, a 2010 survey showed that 91% of respondents believe that the state should meet its electricity needs by using renewable energy such as wind power, and 79% of respondents favor requiring electric utilities to use renewable energy resources for at least 20% of the electricity they generate.<sup>xiv</sup> Finally, a national survey conducted in 2010 revealed that 89% of respondents believe that increasing the amount of energy the nation gets from wind is a good idea.<sup>xv</sup>

Despite wind energy's numerous benefits, wind development is not appropriate everywhere. Individuals and communities should make informed decisions on local wind development. For more information, visit <http://www.windpoweringamerica.gov>



[www.windpoweringamerica.gov](http://www.windpoweringamerica.gov)

U.S. Department of Energy

<sup>i</sup> American Wind Energy Association. Press release, January 24, 2011. [http://www.americanwindenergyassociation.net/rn\\_release\\_01-24-11.cfm](http://www.americanwindenergyassociation.net/rn_release_01-24-11.cfm). Accessed March 12, 2011.

<sup>ii</sup> Wiser, R.; Bolinger, M. (2010). 2009 Wind Technologies Market Report. 88 pp.; [http://www.windandhydro.energy.gov/pdfs/2009\\_wind\\_technologies\\_market\\_report.pdf](http://www.windandhydro.energy.gov/pdfs/2009_wind_technologies_market_report.pdf).

<sup>iii</sup> American Wind Energy Association. U.S. Wind Industry Annual Market Report 2010. <http://www.awea.org>.

<sup>iv</sup> In 2008, the U.S. Department of Energy published the report 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply. The report includes a description of the significant job benefits that would result from a 20% scenario. An overview of the modeling utilized to derive the results is beyond the scope of this fact sheet, but the full report can be accessed at <http://www.windandhydro.energy.gov/pdfs/41869.pdf>.

<sup>v</sup> Central Intelligence Agency. The World Factbook. <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2175rank.html?countryCode=&rankAnchorRow=#>. Accessed March 11, 2011.

<sup>vi</sup> Central Intelligence Agency. The World Factbook. <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2182rank.html>. Accessed March 11, 2011.

<sup>vii</sup> 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply. (2008). 248 pp.; <http://www.windandhydro.energy.gov/pdfs/41869.pdf>.

<sup>viii</sup> 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply. (2008). 248 pp.; <http://www.windandhydro.energy.gov/pdfs/41869.pdf>.

<sup>ix</sup> American Wind Energy Association. Wind Energy Basics. [archive.awea.org/newsroom/pdf/Wind\\_Energy\\_Basics.pdf](http://archive.awea.org/newsroom/pdf/Wind_Energy_Basics.pdf).

<sup>x</sup> 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply. (2008). 248 pp.; <http://www.windandhydro.energy.gov/pdfs/41869.pdf>.

<sup>xi</sup> Utility Wind Integration Group. Utility Wind Integration State of the Art. (2006). <http://www.uwig.org/UWIGWindIntegration052006.pdf>.

<sup>xii</sup> Wiser, R.; Bolinger, M. (2010). 2009 Wind Technologies Market Report. 88 pp.; [http://www.windandhydro.energy.gov/pdfs/2009\\_wind\\_technologies\\_market\\_report.pdf](http://www.windandhydro.energy.gov/pdfs/2009_wind_technologies_market_report.pdf).

<sup>xiii</sup> Wind Power Today, 2010, Wind and Water Power Program. (2010). 32 pp.; <http://www.windandhydro.energy.gov/pdfs/47531.pdf>.

<sup>xiv</sup> Center for Rural Affairs. "Polling Shows Nebraskans Favor Renewable Energy." <http://www.cfra.org/NE-wind-poll>. Accessed March 21, 2011. Global Strategy Group conducted the survey on behalf of the Center for Rural Affairs, American Wind Energy Association, Wind Coalition, and the Energy Foundation.

<sup>xv</sup> Neil Newhouse, Public Opinion Strategies, Anna Bennett, Bennett, Petts & Normington conducted the survey. American Wind Energy Association. Press release, April 22, 2010. [http://archive.awea.org/newsroom/releases/04-22-10\\_Poll\\_Shows\\_Wind\\_Works\\_for\\_Americans.html](http://archive.awea.org/newsroom/releases/04-22-10_Poll_Shows_Wind_Works_for_Americans.html). Accessed March 21, 2011.