

Wind Energy

Europe: A Global Leader of a Fruitful Industry

Excerpt from *Powering Our Future: An Energy Sourcebook for Sustainable Living*. The text was modified to fit the website.

A summer breeze on a warm evening may seem gentle and mild, but this valuable resource contains the strength to power entire cities. The circulation of global air currents is an indirect source of solar energy, created by the uneven warming of the earth's atmosphere. Classified as a green power source, wind energy offers the benefits of providing a clean, renewable, and homegrown source of power. The incredible potential of wind power has not been overlooked by utility companies and energy experts, especially in light of its cost effectiveness. Since the early 1980s, the cost of wind energy has dropped almost 10-fold from \$0.38 per kilowatt-hour (kW-h) to less than \$0.04 kW-h, economically challenging even conventional fossil fuels. With such economic incentives, the global wind industry has doubled its electricity generating capacity every three years since 1990, and this rate continues to accelerate. Wind power is well-poised to play an increasingly vital role in the energy mix during the twenty-first century. Despite its advantages, the wind industry needs government support in most nations to sustain recent growth rates.

Europe is the leader in wind-generating capacity, with nearly three-quarters of the global share. As the global leader of a thriving industry, Europe's economy has benefited by supplying 90 percent of the world's wind power equipment. Wind-generating capacity in Europe topped more than 28,400 MW at the end of 2003. In the same year, air currents produced 2.4 percent of Europe's electricity, serving 35 million Europeans. While wind capacity growth was strong at 23 percent in 2003, this rate was insufficient to meet the European Union's (EU) recent aggressive objective to obtain 22 percent of its power from renewable sources by 2010. To attain such a goal under the Renewables Directive, wind power will necessarily provide up to half of the total. Roughly 84 percent of EU wind capacity is centered in three nations: Germany, Spain, and Denmark. Germany is the global leader with 14,600 MW of generating wind capacity, followed by Spain and Denmark with 6,200 MW and 3,100 MW respectively.

Denmark has become the global leader in the manufacture of wind turbines. The nation's internal industry is strong, as well, with 21 percent of its electricity derived from wind in 2003, the highest capacity per capita in the world. Denmark's success in wind development was jump-started with the implementation of a generous subsidy available to wind turbine installations in 1979. As the policy was a tremendous success, it was retracted a decade later, though other incentives remained. Today, Denmark's federal energy policy, Energy 21, supports non-utility expansion by offering subsidies and tax incentives. The nation also has an electricity tax, which generates funding for energy-efficient programs. There are a number of other energy-related taxes on fossil fuels as well as carbon dioxide and sulfur dioxide emissions. As a result of the government jump-starting the wind industry in the 1980s, Denmark now benefits from exporting \$3 billion worth of wind turbines annually, making it the nation's largest export commodity.

Sources

Brown, Lester, R., "Europe Leading World into Age of Wind Energy," Solar Access, May 10, 2004.

<http://www.worldenergy.org/wec-geis/publications/reports/ser/wind/wind.asp>, accessed November 13, 2004. The World Energy Council sponsors this Web site for each major source of energy. This description of "Survey of Energy Resources: Wind Energy" was compiled by David Milborrow of the United Kingdom.

<http://www.ewea.org/documents/07010375gw%20launch%20FINAL.pdf>, accessed November 13, 2004. The European Wind Energy Association released an article on entitled "86 Million Europeans to get power from the wind by 2010: Wind Industry sets bigger targets for Europe." The article is dated October 7, 2003.

http://www.ewea.org/documents/0203_EU2003figures_final6.pdf, accessed November 13, 2004. The European Wind Energy Association produced a press release entitled "Wind power expands 23% in Europe, but still only a 3-member state story." It was released on February 3, 2004.

Kamins, Sara, Governments are Key to Renewable Energy Growth: Best Policies from around the World, Global Energy Network Institute, 2003, p. 5. The Global Energy Network Institute was established in 1986 to promote the rapid expansion of a worldwide sustainable energy system.