



Market Research Analyst: Wind Power Deployment

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There are many thousands of wind turbines operating, with a total capacity of 73,904 MW of which wind power in Europe accounts for 65% (2006). Wind power was the most rapidly growing means of alternative electricity generation at the turn of the 21st century. World wind generation capacity more than quadrupled between 2000 and 2006. 81% of wind power installations are in the US and Europe, but the share of the top five countries in terms of new installations fell from 71% in 2004 to 62% in 2006.

By 2010, the World Wind Energy Association expects 160GW of capacity to be installed worldwide up from 73.9 GW at the end of 2006, implying an anticipated net growth rate of more than 21% per year.

Germany, Spain, the United States, India, and Denmark have made the largest investments in wind-generated electricity. Denmark is prominent in the manufacturing and use of wind turbines, with a commitment made in the 1970s to eventually produce half of the country's power by wind. Denmark generates nearly one-fifth off its electricity with wind turbines -- the highest percentage of any country -- and is fifth in the world in total wind power generation.

Germany is the leading producer of wind power, with 28% of the total world capacity in 2006 and a total output of 38.5 TWh in 2007 (6.3% of German electricity); the official target is for renewable energy to meet 12.5% of German electricity needs by 2010 — this target may be reached ahead of schedule. Germany has 18,600 wind turbines, mostly in the north of the country — including three of the biggest in the world, constructed by the companies Enercon (6 MW), Multibrid (5 MW) and Repower (5 MW). Germany's Schleswig-Holstein province generates 36% of its power with wind turbines.

In 2005, the government of Spain approved a new national goal for installed wind power capacity of 20,000 MW in 2010. With installation of 3515 MW in 2007 (for a total figure of 15,145 MW), this target will probably be reached ahead of schedule. A significant acceleration of the bureaucratic proceedings and connections to grid, and the legislative change occurred during 2007 (with Royal Decree 661/2007), have accelerated the developing of many wind parks, so that they could still run under the previous more favourable conditions.

In recent years, the United States has added more wind energy to its grid than any other country; U.S. wind power capacity grew by 45% to 16.8 gigawatts in 2007.[32] Texas has become the largest wind energy producing state, surpassing California. In 2007, the state expects to add 2 gigawatts to its existing capacity of approximately 4.5 gigawatts. Iowa and Minnesota are expected to each produce 1 gigawatt by late-2007.[33] Wind power generation in the U.S. was up 31.8% in February, 2007 from February, 2006.[34] The average output of one megawatt of wind power is equivalent to the average electricity consumption of about 250 American households. According to the American Wind Energy Association, wind will

generate enough electricity in 2008 to power just over 1% (4.5 million households) of total electricity in U.S., up from less than 0.1% in 1999. U.S. Department of Energy studies have concluded wind harvested in just three of the fifty U.S. states could provide enough electricity to power the entire nation, and that offshore wind farms could do the same job.

India ranks 4th in the world with a total wind power capacity of 6,270 MW in 2006, or 3% of all electricity produced in India. The World Wind Energy Conference in New Delhi in November 2006 has given additional impetus to the Indian wind industry. The windfarm near Muppandal, Tamil Nadu, India, provides an impoverished village with energy. India-based Suzlon Energy is one of the world's largest wind turbine manufacturers.

In December 2003, General Electric installed the world's largest offshore wind turbines in Ireland, and plans are being made for more such installations on the west coast, including the possible use of floating turbines.

In 2005, China announced it would build a 1000-megawatt wind farm in Hebei for completion in 2020. China reportedly has set a generating target of 20,000 MW by 2020 from renewable energy sources — it says indigenous wind power could generate up to 253,000 MW. Following the World Wind Energy Conference in November 2004, organized by the Chinese and the World Wind Energy Association, a Chinese renewable energy law was adopted. In late 2005, the Chinese government increased the official wind energy target for the year 2020 from 20 GW to 30 GW.

Mexico recently opened La Venta II wind power project as an important step in reducing Mexico's consumption of fossil fuels. The project (88MW) the first of its kind in Mexico, will provide 13 percent of the electricity needs of the state of Oaxaca and by 2012 will have a capacity of 3500 MW.

Another growing market is Brazil, with a wind potential of 143 GW. The federal government has created an incentive program, called Proinfa, to build production capacity of 3300 MW of renewable energy for 2008, of which 1422 MW through wind energy. The program seeks to produce 10% of Brazilian electricity through renewable sources.

South Africa has a proposed station situated on the West Coast north of the Olifants River mouth near the town of Koekenaap, east of Vredendal in the Western Cape province. The station is proposed to have a total output of 100MW although there are negotiations to double this capacity. The plant could be operational by 2010.

France recently announced a target of 12 500 MW installed by 2010.

Canada experienced rapid growth of wind capacity between 2000 and 2006, with total installed capacity increasing from 137 MW to 1,451 MW, and showing an annual growth rate of 38%. Particularly rapid growth was seen in 2006, with total capacity doubling from the 684 MW at end-2005. This growth was fed by measures including installation targets, economic incentives and political support. For example, the Ontario government announced that it will introduce a feed-in tariff for wind power, referred to as 'Standard Offer Contracts', which may boost the wind industry across the province. In Quebec, the provincially-owned electric utility plans to purchase an additional 2000 MW by 2013.