



### Wind energy - Status and Trends

Installed wind energy has been increasing rapidly worldwide over the last 5 years and now accounts for up to 3% of electricity consumption in Europe. In a recent study, a British researcher investigated the status and trends of wind energy. The author outlines that wind energy is an economic, environmentally friendly and mature technology capable of contributing to a balanced power supply. Though most wind energy development and growth has been focused in Europe, this situation is likely to change over the next 5 to 10 years.

The use of renewable energies is one of the most important alternatives that can be implemented to reduce greenhouse gas emissions and ensure a sustainable energy supply. In this context, wind energy is believed to be capable of playing a major role in reaching the EU's target of 12% renewable energy by 2010. In March 2007, all Member States agreed on a binding target of a 20% share of renewable energies in overall EU energy consumption by 2020<sup>1</sup>. Wind energy currently accounts for about 3% of European energy production which offsets nearly 50 million tons of CO<sub>2</sub>. A small wind farm of 5-10 turbines at a good wind site can be installed in 2-3 months, and can meet the annual electricity demand of 4000 European households over a period of 20-30 years.

In a recent study, a British scientist investigated current wind energy technology and how it is deployed in Europe. The study covers price aspects and research focuses with a view to highlighting the latest trends in wind power and barriers to development. The main results are as follows.

- As captured energy is proportional to the blade area of the wind turbines, wind technology has mostly evolved towards higher and bigger wind turbines over the last decade. Nowadays, the design of wind turbines is undergoing a shift using power electronics to bring additional energy capture and control to the quality of power delivered to the grid.
- The energy payback time (the time it takes for a wind turbine to generate the energy used in its installation, production and dismantling) is approximately 6-8 months, which is similar to conventional energy, but with no ongoing fuel supply costs or waste production. Payback time for CO<sub>2</sub> is between 13 and 20 months, return on investment is therefore rapid in terms of environmental and economic costs.
- Various support mechanisms for energy production exist, the most common being investment subsidies, fixed premiums, taxes and fixed feed-in tariffs. Fixed feed-in tariffs, where wind energy developers are paid a fixed price for electricity to the grid over a guaranteed time period is by far the most successful support scheme as experienced by European countries currently leading the wind energy market.
- Nearly 75% of installed wind energy capacity worldwide was located in Europe in 2005, and the annual growth rate of the sector has been close to 30% over the last 5 years, confirming the actual leading role of Europe in wind energy. However, the projected expansion of the world wind energy market is causing concerns over the availability of wind energy components. This, combined with increases in the price of steel, which is used for wind turbine towers, may result in increases in the price of wind turbines over the next few years.
- The largest barriers to wind energy development are public perception, mostly focused on visual intrusion, and grid integration due to the intermittency of wind energy once penetration exceeds about 20%.

The author concludes that wind energy is a mature and readily available technology. Wind energy can play a major role in catering for the growing demand for energy while reducing emissions of greenhouse gases. Europe is currently leading the wind power market but a secure future for wind energy relies on a secure long-term market for renewably generated electricity. In this context, the harmonisation of support schemes for renewable energy might be desirable if based on successful European models.

<sup>1</sup>For more information, see the European Council - Presidency Conclusions of 9 March 2007, available at [www.consilium.europa.eu/ueDocs/cms\\_Data/docs/pressData/en/ec/93135.pdf](http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf)

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