

# Wind Energy Market

A brief introduction into the Market for Wind Energy

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## 1 Introduction

The signing of the Kyoto Protocol with its binding emissions reduction targets in 1997 has created awareness of Climate Change as well as a framework to implement measures to curb emissions.

International (CDM&JI) as well as national policies and incentives are driving investment in the renewable energy sector.

Electricity generation from renewable sources is seen as one of the solutions to meet the rising energy demand in an environmentally friendly way.

According to a report from REN21, Wind energy has the largest share of renewable energy investment and continues to grow at 25-30% per year to reach more than 90 GW cumulative capacity in 2007 – 11 times the capacity in 1997.(1)

The following sections will examine different aspects of wind power generation in more detail.

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## 2 Market Size

The market size of the wind power market will be highly affected by policies for renewable energy and the cost efficiency of wind power compared to other ways of power generation.

The EU has set a target of generating 20% of its power from renewable sources by 2020.(2)

An investigation by EUWINet found that the EU member states already contribute about 75% of world wind power and the median growth of wind power is 35% per annum.

Electricity generation in the EU25 has risen 21.8% from 1995 to 2005.(3) As all these countries belonged

to the developed world in 1995 already it can be assumed that this rate of growth will remain unchanged in the future. This would lead to an increase from 3.2 million GWh in 2005 to an electricity generation of about 4.3 million GWh in 2020.(4) A 20% target for renewable energy would be equal to 0.87 million GWh of generation.

On a global basis the market for wind power has been expanding faster than any other source of renewable energy. From just 4,800 MW in 1995 the world total has multiplied more than twelve-fold to reach over 59,000 MW at the end of 2005. In the Clean Development

Mechanism 135 projects for wind power generation are currently registered to be undertaken in the developing world. Merrill Lynch expects the global installed capacity to exceed 200GW by 2011 with a slowly declining growth rate from 2007 on.

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### 3 Market Drivers

Different factors are driving the growth in wind energy.

1. **Environmental reasons:** In times of high awareness of climate change, wind is seen as low carbon generation and also having no effects on air quality. There is no preparation of the input fuel necessary. This avoids oil spills, mining accidents and other risks.
2. **Security of supply:** Wind energy is an indigenous power source which can be installed in any country in the world and does not have any fuel cost associated. With rising world energy needs, if no energy efficiency measures are put in place, countries will have to rely more and more on imports from companies mostly owned by producing countries.
3. **Economics:** The technological advance has halved the cost by increasing output by factor 180 over the last twenty years. Together with rising fuel prices this has made wind in good locations competitive to gas and coal generation. Policies and incentives for renewable energy are helping to make wind farm projects profitable apart from that.

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### 4 Technologies and Players

There are two types of wind Turbines: The horizontal axis turbine and the vertical axis turbine. The commonly used wind turbine is the Horizontal axis turbine. Horizontal Axis Wind Turbines (HAWT) have the main rotor shaft and generator at the top of a tower, and must be pointed into the wind. Most turbines have a gearbox, which turns the slow rotation of the blades into a quicker rotation that is more suitable for generating electricity.

Modern Turbines are getting bigger and bigger. Currently Enercon(5) offers a 2.3MW turbine with 78-113m tower and a rotor diameter of 71m and Vestas(6) is offering a 3MW model and REPower(7) is even going up to 5MW.

Current issues are the supply of gearboxes as there is only a limited number of suppliers and also the wind speed at which turbines have to be switched off from generation.

The top 10 companies in the sector supplied about 95% of the total in 2006. Vestas is the Market leader with a market share of 28% followed by Gamesa (16%), GE Wind and Enercon (both 15%).(8)

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### 5 Outlook

In my opinion the future looks bright for wind energy. High prices for fossil fuels together with a price for carbon emissions through the EU Emissions Trading Scheme and Kyoto Mechanisms will help wind energy to stay attractive. Technological progress and mass production is going to reduce costs per kWh further and make wind energy generation more reliable.