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Wind Energy is a Strategic Option for Achieving a Sustainable Energy Supply - so What Needs to be Done to Realise its Potential?

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WIND POWER - A MATURING TECHNOLOGY

Wind energy has matured over the last decade and, if external costs of conventional power generation are considered (for example by putting a price on carbon and charging that price to its emitters), then it is already commercially competitive with conventional power generation in many places, as well as being the generation technology of choice.

The technology is being deployed onshore at large scale in many countries across the world, having reached an installed capacity of more than 120 GW at the end of 2008 (with a spectacular growth rate of 36% in that year). This should exceed 145 GW in 2009, which would equal the generation capacity of about 150 large coal or nuclear power plants. In the US and Europe, wind energy provided the largest part of the newly installed power generation capacity in 2008, with 42% and 35% respectively (source: Global Wind Energy Council - GWEC). Clearly, the global market is developing very dynamically and, despite the economic downturn since 2008, we are likely to see further grow over the next few years. This growth of onshore wind power will be driven by the most vibrant markets - China and USA, followed by India. The European market, despite constant strong development for more than 10 years in Germany, Spain and Denmark, still holds great potential, particularly in France, Italy and Portugal; Turkey is also rapidly developing its utilisation of wind resource and Eastern European markets like Poland, Bulgaria and Romania are expected to catch up over the next decade.

Offshore wind energy is a promising technology that is expected to substantially contribute to a clean energy supply

Figure 1:

Figure 2:

in the future, in the EU and possibly also in other regions of the world. The UK is becoming the world leader as a series of large projects have been implemented in its waters and there are more planned over the next few years. Raw resource for offshore wind in the UK is world class and, because of UK involvement in offshore wind from the outset, there is potential for the national industry to prosper and reach the same scale as oil and gas business did in the 1970's and 1980's. In addition, offshore wind in northern European coastal regions finally seems to have entered a sustainable growth phase. Having said all of this, it is important to remember that it is not yet a mature industry and, in most places, it has developed in fits and starts over the past decade (more or less its first decade). The good news is that over the past two years, largely due to UK projects, the industry has gained momentum, and contractors have started to see it as a sector in which they want to work. This is a good indicator of maturation and, in time, cost reduction. A recent study which Garrad Hassan produced for the British Wind Energy Association (BWEA) indicates that the current high capital costs of offshore wind could decrease by up to 20% over the next 5 years if the right course is taken (development of supply chain in the UK and other offshore markets).

In the face of climate change, volatile energy markets and the current economic crisis, wind energy is a strategic option for climate, energy and economic policy; it does not emit any carbon dioxide or consume any fossil fuel; it strengthens the industrial basis of any country that chooses to consistently support it through market-led and supply-side measures. In fact, economic opportunities are huge: Spain, Germany and Denmark have created more than half a million new jobs in the renewable energy industry, a large percentage of them in wind energy. In times of economic downturn, the development of a renewable energy industry provides a glimmer of hope for countries whose traditional industries like car manufacturing or ship building are struggling and can only be kept alive with massive support from governments. At the same time, the limit for the expansion of wind energy is still far from being reached and, as the limitations of fossil fuel use become increasingly clear, worldwide wind resources remain abundant.

STRATEGIC DRIVERS TO ENSURE FURTHER DEVELOPMENT

Although growth has been impressive, markets are highly dependent on the right policies being set by governments. So, what are the strategic drivers that are expected to ensure the future development of onshore and offshore wind energy and, more broadly, of renewable energy? We consider this below, with focus on the UK and EU but with relevance worldwide.

The main driver for the development of wind energy in European countries is the integrated energy and climate change policy adopted by the EU in December 2008. One of the main elements intensively negotiated between member states is the framework directive for renewable energies, which sets an ambitious target for renewable energy providing for 20% of the EU's final energy consumption by 2020. This overall target translates into binding national targets that each country must meet via appropriate measures.

The EU renewable energy directive