

RENEWABLE ENERGY IN SPAIN AND GERMANY - MARKET OPPORTUNITIES -

Europe



EXECUTIVE SUMMARY

Germany and Spain have been selected for the 2009 Renewable Energy Mission, based on their success in both the implementation of renewable energy resources and their positions as global leaders in the industry. Both countries are European leaders in on- and offshore wind energy projects.

Spain currently ranks 3rd in the world, behind the United States and Germany, for both production of wind turbines and installed capacity of wind power. By the end of 2008, 11.5% of electricity generated in Spain was directly attributed to wind power, and by the year 2010 Spain intends to reach 20,000 MW of installed capacity per government outlined goals. Spain has recently approved a map of locations along their 8,000 kilometers of coastline for potential offshore wind projects, and major companies have begun bidding for their development. Proposed projects amount to nearly 6,000 MW of additional capacity.

Although there has been a recent decrease in trade between the United States and Spain due to the economic recession, the drive for renewable resources and energy business remains robust. The recent acquisition of the U.S. energy company Energy East (owner of Central Maine Power) by Spanish energy giant Iberdrola has proven that there is opportunity presented within the sector to increase Spanish investment in the United States. Prior to the acquisition, Iberdrola was already the 2nd largest operator of wind power in the United States, with 2,000 MW of installed wind capacity, a volume they intend to increase to 6,900 MW by 2012. With strong existing connections to the Spanish renewable energy market, Maine is well positioned to expand the wind energy sector within the state through foreign investments.

Germany and the United States have a history of significant trading over the course of the last decade. Germany was the 5th largest market for U.S. exports in 2008. From 2006 to 2008, the total dollar amount of all commodities exported from the U.S. to Germany jumped from \$41.3 billion to \$54.7 billion. Meanwhile, the total dollar amount exported from Germany to the U.S. soared from \$95.7 billion in 2007 to \$104.7 billion in 2008.

Germany's renewable energy sector is a quickly growing area of the country's economy, and is considered a leading sector by the U.S. Department of Commerce. Offshore wind farm projects have been approved by the German government and are being developed. German manufacturers have begun testing for offshore wind turbines as well, with plans to reach 500 MW by 2010 and 3,000 MW by 2015.

SPAIN – WIND ENERGY MARKET OVERVIEW

- Spain ranks 3rd in the world for installed wind power capacity, behind the United States and Germany. As of March 2009, Spain as a whole was operating 16,740 MW of installed capacity from wind power. In 2007, 9.1% of the electricity generated in Spain was directly from wind power, a percentage that increased to 11.5% by the end of 2008.¹
- A report by the Spanish Wind Power Association (AEE) notes that 35% of the nominal GDP for Spain was directly from the Wind Power Sector. The same report forecasted that 42% of the GDP would be attributed to the Wind Power Sector in 2010, and that number would reach 45% by 2012, based on foreseen trends within the sector.
- In 2007, the Spanish wind industry included over 50 companies and generated approximately \$5.73 billion (€4.100 billion) in business volume. 32% of the Spanish wind workforce is involved in the production of wind turbine components, 31% in specialized services, 16% in wind turbine manufacturing and 21% in development and operation committees.²
- In Spain, installed wind energy capacity grew by 29% last year (2008) and wind energy production grew by 16%.³
- Although Maine has not seen any direct trade to Spain pertaining to this industry, the United States has totaled \$1.45 million (€1.04 million) in exports of the HS classification number 841280—Engines and motors, wind powered—for 2009 YTD. \$1.33 million (€51,632) of these exports came from Pennsylvania, where Spanish wind energy specialist Gamesa has a wind turbine manufacturing plant and corporate headquarters.
- The Spanish company Iberdrola recently purchased the American energy company known as Energy East, the largest industrial acquisition ever by a Spanish company in the United States. Iberdrola was already the 2nd largest company in wind power within the United States, operating at 2,000 MW, prior to the acquisition. Iberdrola intends to increase that capacity to 6,900 MW of operating capacity by 2012.
 - Energy East itself operates in the northeastern region of the United States and runs companies including Central Maine Power (CMP), which delivers electricity to roughly 596,000 customers throughout the state of Maine. The entirety of Energy East includes other companies like CMP, with a customer base for electricity of \$1.83 million (€1.31 million); they sell 39,000 GWh of electricity to these customers. During the next five years, Energy East intends to make over \$3 billion in reliability and infrastructure investments—including wind energy investments.

¹ Spain. Asociacion Empresarial Eolica. Estudio macroeconomico del impacto del Sector Eolico en Espana. Comp. Jose Donoso. Deloitte, 2008.

² European Wind Energy Association. <http://www.ewea.org/index.php?id=194>

³ Spain for Renewable Energies.

http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261773_6279208_0,00.html

- Spain's Renewable Energy Plan (2005-2010) outlines the goals of the Spanish government for the country and its energy needs. Its purpose is to promote the sustainable development of the country through the development of technology within the renewable energy sector. The goal is to cover 12% of the total energy consumption in Spain with renewable energy sources by the year 2010. To achieve this, installed wind power capacity will need to be 20,155 MW. At the beginning of 2008, Spain had 15,145 MW of installed wind power capacity, which represented 27% of the total installed capacity in the European Union.⁴
- Royal Decree 661/2007, passed on May 25, 2007, outlines the intentions of the Spanish government to reduce dependency on foreign imports of fossil fuels and other such energy sources by better utilizing their own resources for energy and protecting the environment. Royal Decree 661/2007 follows the requirements of the Kyoto Protocol to reduce emissions and develop sustainably.
 - This Decree includes feed-in tariffs which incentive the investment in RES (Renewable Energy Sector), for which the Wind Energy Sector has a tariff of €7.32 cents/ kWh for 20 years and €6.12 cents/ kWh later on.
- Spain has a large potential for offshore wind power in addition to its already growing market for onshore wind power. In 2007, the Spanish government said that they would like to eliminate nuclear power plants within the country through the utilization of their nearly 8000 kilometers of coastline for offshore wind farms. RD 661/2007 helped in the push for more offshore wind farms in Spain.
 - On April 18, 2009 the Spanish government approved a map setting out the areas for potential offshore wind power developments. Companies such as Iberdrola Renovables and Acciona are now able to hand over bids for the development of wind farms. Projects amounting to 6,000 MW of capacity have already been proposed. Iberdrola Renovables already has six offshore projects in the works near Cadiz and Huelva in Southern Spain, as well as Eastern Spain near Castellon. Both sites will have an installed capacity of 3,000 MW in total. AEE forecasted Spain to be in full development of its offshore projects by 2012-2015.

⁴ Spain. Ministerio de Industria, Turismo y Comercio. Disposiciones generales: Real Decreto 661/2007.

GERMANY – WIND ENERGY MARKET OVERVIEW

- The German renewable energy industry is one of the most important growth industries in Germany. The industry employs around 278,000 people and covers 15.1% of German electricity consumption, 7.3% of heat consumption and 5.9 % of fuel consumption. Renewable energy's contribution to total energy consumption in Germany was around 9.6% in 2008; in 2008 it saved around 115 million tons of CO₂⁵.
- The German renewable energy sector continues to play an important role in international markets as well. German manufacturers represent 37% of the world market share of the wind energy and Germany is the world leader for installed capacity of wind energy and photovoltaic systems. Every third solar panel and every second wind rotor is made in Germany, and German turbines and generators used in hydro energy generation are among the most popular worldwide⁶.
- The Renewable Energy Sources Act (EEG), which came into force in 2000, has supported much of the success renewable energy in Germany. Under EEG regulations, electricity produced from renewable energy sources is given priority for grid connection, grid access in either distribution and transmission grids, and power dispatch. These sources include hydropower, wind, solar, and biomass energy, geothermal energy as well as landfill, pit and sewage gas. Grid operators are obliged to feed in electricity produced from renewable energy and buy it at a minimum price within their supply area.
- A new Roadmap (Energy Policy Roadmap-2020) published by the German Federal Ministry for the Environment outlines the route that Germany will take to completely convert to renewable energy, and add 800,000 to 900,000 new clean-tech jobs by 2030 in the process. Germany aims to increase its energy productivity by 3% per year, making the country twice as energy efficient by 2020⁷.
- The 2009 U.S. Department of Commerce Country Commercial Guide for Germany lists Renewable Energy as a leading sector for U.S. export and investment:
 - “Germany aims for 12.5 percent of electricity to be produced from renewable sources by 2010. Experts forecast as much as 47 percent of German electricity from renewable sources by 2020.”

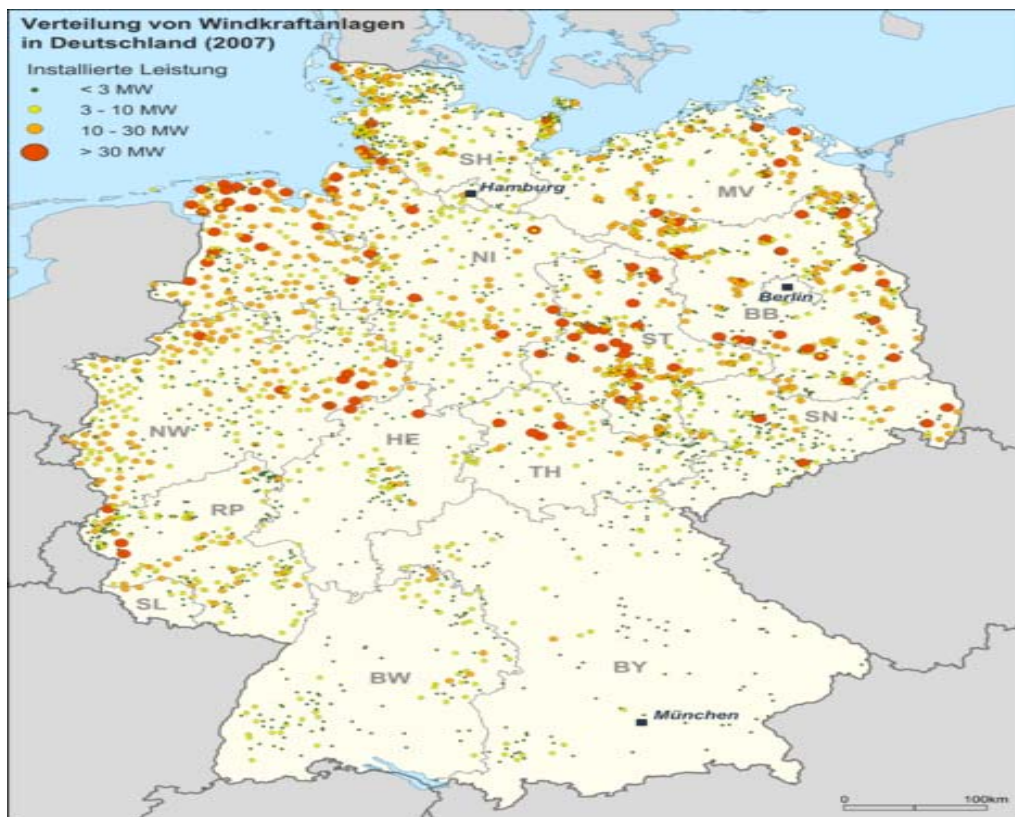
(Source: U.S. Commercial Guide for Germany, 2009)

⁵ http://en.wikipedia.org/wiki/Renewable_energy_in_Germany

⁶ http://www.bmu.de/files/pdfs/allgemein/application/pdf/roadmap_energiepolitik_en.pdf

⁷ http://www.bmu.de/files/pdfs/allgemein/application/pdf/roadmap_energiepolitik_en.pdf

- According to calculations from BWE (German Wind Energy Association) there is still a potential for new turbine capacity up to 10,000 MW that could be erected on already commissioned sites onshore. By 2020, the overall German onshore capacity could be at 45,000 MW, with an additional 10,000 MW offshore wind.
- Offshore wind energy capacity in Germany is predicted to be about 500 MW by 2010, and 3,000 MW by 2015. Mainly for nature conservation reasons, most German offshore parks will be erected up to 20-60 km away from the coastline and in 20-40 meters deep waters. More than 20 projects have been licensed by now in the North and the Baltic Seas by the national maritime authority, a small number of additional projects by the Federal States, adding up to an overall capacity of over 5.000 MW⁸.
- Map of German wind farms:



(source: http://upload.wikimedia.org/wikipedia/commons/7/7c/Windkraftanlagen_in_Deutschland.png)

⁸ <http://www.wind-energie.de/en/wind-energy-in-germany/>