

## China: Wind power to meet Beijing's growing energy needs



In recent years China has experienced exceedingly rapid development, making it the world's fastest growing economy. This development has been facilitated by the use of fossil fuels, with heavy reliance upon China's coal reserves in particular. As a direct result of the high levels of fossil fuel combustion, air quality in cities such as Beijing is incredibly poor. A recent study by the World Health Organisation found that over 650,000 people die prematurely from diseases related to air pollution in China every year. This is the highest annual incidence of pollution-related deaths globally, and with air pollution levels continuing to rise due to China's increasing dependence on fossil fuel this figure is set to grow. Concern over this high level of pollution has prompted China to set a target of 15% renewable energy by 2020.

### Key Facts

**Project type:**  
Renewable Energy: wind

**Project standard:**  
VCS (pre-CDM)

**Total emission reductions:**  
100.720 t CO<sub>2</sub>e p.a.

**Project start date:**  
November 2006

**Project partner:**  
Beijing Jineng Energy Technology  
Investment Company

**Validator:**  
TÜV SÜD (DOE)

**Verifier:**  
Bureau Veritas (DOE)

### Sustainable solutions for economic growth

This project offered by First Climate goes some way towards meeting China's renewables target, thereby reducing air pollution and the emission of climate change causing greenhouse gases. It involves the construction of a wind farm to generate clean energy to be fed into the grid. Located 70km northwest of Beijing on the banks of the Guanting reservoir, the Guanting wind farm consists of 33 turbines with an installed capacity of 1.5MW each. An annual 98.9GWh of electricity is supplied to the North China Power Grid, displacing the equivalent amount of fossil fuel generated energy.

One of the first large-scale wind farms in the Beijing area, this project has created 20 additional jobs and strengthened domestic capability to manufacture, install, operate, and maintain a substantial wind farm and its associated technology. By demonstrating and disseminating this clean, renewable energy source this project assists in the diversification of China's energy supply and in the meeting of its renewable energy targets. In doing so, it also contributes towards reducing the excessive number of pollution related premature deaths in China each year.

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### Technology brief – how it works

Driven by the kinetic energy of moving air, the mechanical energy created by a rotor is fed into an attached generator. While wind speed is ultimately determined by atmospheric conditions, it is also dependent upon ground characteristics. A rough surface exerts significant friction; effectively consuming energy and thereby slowing down the moving air. Smooth surfaces create very little friction the most obvious example being higher wind speeds in coastal areas. In the last two decades wind power technology has rapidly improved. The size and power output have consistently increased while lowering the cost per electricity unit. Constructions with a maximum power output of 1.5 megawatts are now considered standard technology.



### Sustainability benefits

Besides the reduction of greenhouse gas emissions due to the increased share of clean electricity generation, the project contributes further to sustainable development in the region by

- Reducing the emission of harmful pollutants, thereby improving the health of local people and reducing the number of premature deaths caused by air pollution
- Improving local environmental conditions
- Diversifying China's energy mix, helping it to achieve its renewable energy goals
- Contributing to the economic development of the region through the creation of jobs in the construction, operation, and maintenance of the wind farm
- Promoting and accelerating the commercialization of grid-connected renewable energy technologies and markets
- Demonstrating and disseminating renewable wind energy technology



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