

Energy efficiency ▶

Innovation

Asia

Acquisitions

Wind energy, an energy source harboring bright prospects for Carbone Lorraine



Thanks to its environmental benefits and the depletion of fossil fuel reserves, the use of wind energy is becoming more and more widespread. Having increased from 39,000 MW in 2003 to over 120,000 MW in 2008, worldwide installed capacity is set to **double** again over the next four or five years, **creating a source of business on which Carbone Lorraine aims to capitalise.**

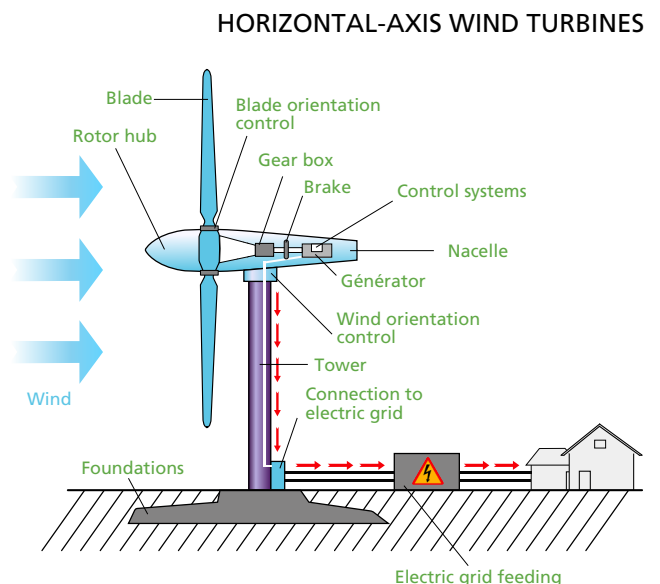
Wind turbines **harness the power of the wind** to generate **mechanical and electrical energy.**

Used since ancient times, wind energy is still employed for some domestic applications, but industrial **wind farms** currently account for the **bulk of the market and installed capacity.**

FROM WIND TO ELECTRICITY, A SOPHISTICATED CIRCUIT

Wind turbines are equipment transforming the **wind's kinetic energy into electric current.** The wind's mechanical energy is converted into electrical power by a sophisticated system.

Horizontal-axis wind turbines, which account for the bulk of the installed base, comprise several components that are set to play a crucial role at all stages of the electricity generation process. **Carbone Lorraine equipment and systems are used in most of these components.** They contribute to the unit's energy efficiency.



- **Tower** : of variable height (60 to 125 meters depending on the power of the wind turbine and the type of terrain), its location and size are **geared to capitalising on the quality of the wind**, with the general principle being that this quality (strength and regularity) increases with altitude.
- Positioned at the top of the tower, the **rotor hub** generally comprises three composite material **blades**. Its diameter varies according to the expected power (70m to 125m for 1.5 MW to 5 MW in capacity respectively). The blades **can pivot on their axis** to optimise the production of energy according to fluctuations in the wind.
- The **nacelle** houses the equipment generating the electrical energy. Two techniques can be used: **either the rotor directly drives the generator via the main shaft** or **it is linked to a gearbox that drives the generator**. This gearbox is used to obtain a rotation speed suitable for the generator. The nacelle is also fitted with **brakes** and **control systems**.
- **A coupling box for the electricity grid** : installed at the base of the wind turbine, it **takes the energy produced** by the generator and **makes it compatible with the national electricity grid.**

Firmly established in this market, the dynamics of which harbor **attractive growth opportunities**, Carbone Lorraine supplies a wide variety of solutions to wind energy players (turbine manufacturers, generator manufacturers and wind farm operators), including brushes, brush-holders, slip-ring assemblies and wire transfer systems as well as electrical protection components (fuses, coolers, switches, disconnectors) the uses of which will be explained in greater detail in the **next edition** of CL Magazine.