

Renewable Energy: the answer is blowing in the wind

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The use of fossil fuels in electricity production is being eroded by the rapid expansion of clean energy. At the global level, installed capacity to generate electricity through wind energy has increased fivefold since 2007, reaching 487GW in 2016. Wind energy is becoming more competitive. The standard reference cost of electricity produced by onshore wind energy is around \$67/MWh, the third lowest among renewable energies. Since 2009, turbine prices and the cost of wind energy have decreased by 26% and 66%, respectively. This performance is the result of public policies and technological progress.

In all countries where wind energy has flourished, there has been some kind of government support: capacity auctions, long-term contracts, subsidies, tax credits, regulated tariffs and targets for renewable energy production. These measures have tried to level the playing field between renewable energies and fossil fuels to attract private investment. Governments justify intervention as a way to: reduce greenhouse gas emissions and pollution, improve energy security, create jobs and boost economic growth, as well as achieve geo-strategic objectives and raise their prestige internationally.

On the technological front, the productivity of wind turbines continues to increase. Since the late 1990s, the average capacity of the data plate has grown by 200%, the average hub height by 50% and the average rotor diameter by more than 100%. The latest turbine models for water bodies (offshore) have a nominal capacity of up to 8,000 kW and rotors of up to 155 metres in length. Although wind power represents only 4% of the world's electricity generation, technological advances in turbine manufacturing could increase this proportion by as much as 20% by 2040. This would require 200GW of onshore gross additions and another 200GW offshore, with combined investments of around \$4 billion.

[Our analysis](#) of the eleven countries in which BBVA has a significant presence, plus China and Brazil, points to a promising future for wind power. In those with comparative advantages for production, high dependence on fossil fuels or strong environmental objectives, investments in wind energy will continue to flow (in many cases, with the help of the public sector) either in the form of new projects or improvements in existing infrastructures.

Brazil, China, Spain and the United States are among the top ten producers of wind energy and, along with Portugal and Uruguay, will remain at the forefront of the wind revolution. China will continue to be the leader in installed capacity, investment and turbine manufacturing. However, the future of the industry will depend more on the commitment of the Chinese government to its development than on market conditions, since coal will remain the cheapest source of energy at least in the short term. For its part, the US withdrawal from the Paris Agreement has made the expansion of renewable energy now dependent on state and local policies.

In less mature markets such as Argentina, Chile, Mexico and Turkey, wind energy will be boosted by improved legal frameworks and other measures aimed at diversifying the energy mix and making electricity markets more efficient. In Peru, Colombia, and Venezuela, abundant hydroelectric and fossil fuels make wind power adoption less of a priority than in countries with greater dependence on fossil fuel imports such as Uruguay, Portugal and Spain.

Overall, while public policy support will continue to play an important role in the expansion of wind power, productivity gains from technological change will make subsidies and tax relief less important as the cost of wind energy projects falls below other alternatives. In other words, investment will increasingly come from private sources and will be allocated based on market conditions.

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