# Issue Overview: Wind power

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TOP: Turbines of the new Burbo Bank offshore wind farm stand in a calm sea in the mouth of the River Mersey on May 12, 2008, in Liverpool, England. Photo by Christopher Furlong. BOTTOM: Graphics courtesy of Bloomberg.

If the government helps pay for, or subsidizes, a new technology, the price of that technology will drop as more of it is produced. Eventually, the funding won't be needed anymore. That is because so many people will be paying money to use the product.

For many years, the U.S. government has been giving renewable energy companies a break on their taxes. In the case of wind power, the government may soon be able to stop. Because there is always a ready supply of wind, wind energy can be extremely cheap. In places like Texas, Germany and elsewhere, producers sometimes have so much of it that they actually pay others to use it instead.

Wind energy may soon become cheap enough for U.S. tax credits to end. But wind power's rapid growth globally isn't just a matter of dollars and cents. Many governments have made big commitments to reducing carbons to limit the damage of climate change. These governments, like those in China, Germany and the United States, are less likely to reduce funding quickly.

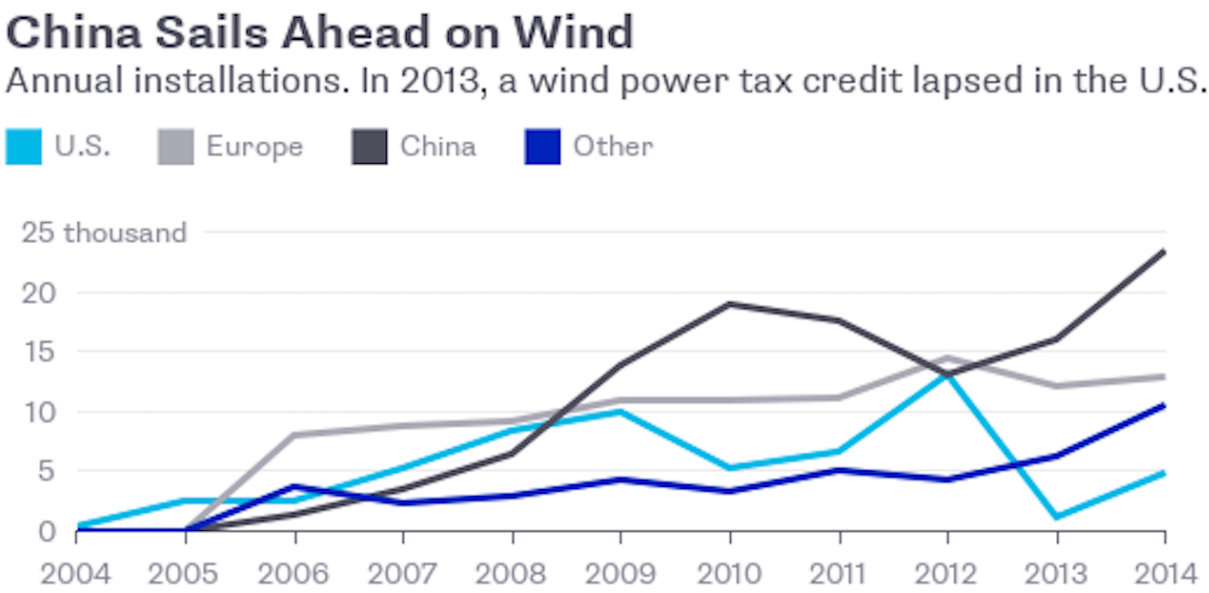
## The Situation

December 2015 was a good month for wind power. A global agreement was reached in Paris on fighting climate change. While it did not contain specific provisions on wind, it was believed the agreement would inspire more investment in renewable energy.

The U.S. Congress reached a deal that extended tax credits for wind and solar power for five years. The wind credit allowed wind energy companies to save on their taxes. This credit was due to run out at the end of 2014. A Bloomberg report estimated that leaving the tax credits in place would instead generate $35 billion for wind power.

The cost of installing wind power is steadily dropping. Government help is therefore needed less and less, and has been declining in much of Europe.

In 2014, global wind capacity reached 369.6 gigawatts. This is more electricity than is used by all of Europe. That year, almost half of the total power was generated in China, which has blown past the U.S. with the world's largest fleet of wind farms. But China has stopped producing about one-tenth of its capacity because it is unable to deliver all of it.




## The Background

As early as the sixth century, Persians discovered that wind could be used to move water and irrigate crops. In early windmills, the sails spun parallel to the ground. The design also proved useful for grinding grains under a slowly turning stone. By the 14th century, Europeans improved productivity by shifting to a horizontal axis. This allowed each cloth blade to absorb energy continuously.

In 1888, an American named Charles Brush built the first full-scale electric wind turbine, in Cleveland. It was 60 feet tall and produced up to 12 kilowatts. Today's towers can exceed 400 feet, and can produce as much as 8000 kilowatts.

NASA focused on wind turbine research after the 1973 oil embargo, when Arab countries stopped selling oil to the United States. In 1992, Congress passed the first tax credit to encourage the development of new technologies. This decision led to lower the costs of turbines designed by American and Dutch engineers. The success on land pushed manufacturers to build even bigger turbines in bodies of water, where winds are stronger and steadier.

In 2014, wind accounted for about 5 percent of power in the U.S. and about half that globally. But wind is growing faster than any other form of energy. In Denmark, on some days, wind already delivers more electricity than the country needs.

## The Argument

In the U.S., opponents of tax credits call them a government giveaway. Proponents say that wind farms take as little as six months to build, which is less than half the time of a coal or natural gas plant. They also say wind farms are the fastest way to meet the renewable energy goals set by 43 states.

To wind supporters, the ambitious goals set by the Paris agreement strengthened the case for government funding. Europe's biggest problem with wind's growth is the lack of empty land, which has led to more interest in offshore wind farms. These water-based farms can calm fears that rows of turbines will spoil scenic views. Similar objections helped block the biggest U.S. offshore proposal, at Cape Cod. However, the first U.S. offshore project is now under construction off Rhode Island. Since offshore farms cost about twice as much as onshore projects, the switch could extend the need for government funding.

There are other difficulties that can come up as well. The strong winds of China's northern provinces attracted many turbines. But the region has a weak infrastructure and was unable to transfer the energy to customers. These problems have shown how difficult it is to match the different pieces of the energy puzzle.