

# Wind Power

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Wind power is one of the fastest-growing sources of energy around the world. It is popular because it is abundant and provides many communities with a clean, local source of electricity. Assisted by technological innovation and years of government subsidies, the cost of wind power — and [solar power](#) — has fallen sharply, so much so that the two industries say that they can sometimes deliver cleaner electricity at prices competitive with power made from fossil fuels.

In the United States, which passed Germany to become the country producing the most wind power, the Department of Energy has estimated that wind power could account for 20 percent of the nation's electricity supply by 2030.

The American Wind Energy Association said the growth of wind power was helped by a federal stimulus package that extended a tax credit and provided other investment incentives for the industry. According to the association, wind projects account for more than a third of all the new electric generation installed in recent years, while over the last six years, domestic wind turbine production has grown twelvefold, to more than 400 facilities in 43 states. A recent study found that in 2012 the industry would support 78,000 jobs, but that number could fall to 41,000 in 2013 without an extension of the production tax credit.

Wind and solar companies are telling Congress that [they cannot be truly competitive and keep creating jobs without a few more years of government support](#).

But the lobbying by the wind and solar industries comes at a time when there is little enthusiasm for alternative-energy subsidies in Washington.

Overall concerns about the deficit are making lawmakers more skeptical about any new tax breaks for business in general. And taxpayer losses of more than half a billion dollars on [Solyndra](#), a bankrupt maker of solar modules that defaulted on a federal loan, has tarnished the image of renewable power in particular. Solyndra was financed under a now-expired program, part of the 2009 [stimulus package](#), that provided government loan guarantees for clean-energy projects, some of which administration officials expected to be risky.

But wind and solar companies argue that the tax breaks they are seeking are different. The tax credits can be taken only by businesses that are already up and running, so taxpayers are less likely to be stuck subsidizing a failing company, proponents say.

## Trade Case Against China

In any case, development of a wind power industry within the United States has been overshadowed by far faster growth elsewhere, especially in China, where the government has heavily promoted the growth of turbine manufacturers.

In late May 2012, the United States Commerce Department ruled that Chinese manufacturers of towers for wind turbines [got unfair subsidies and must pay duties](#) of 13.7 to 26 percent, in a preliminary decision in a case [brought by four American manufacturers of the towers](#).

The decision, the third trade case decided in 2012 in favor of American wind and solar manufacturers, will be followed by another on whether Chinese manufacturers engaged in “dumping” the towers below their cost in the United States. Earlier in May, the Commerce Department said [China was dumping solar panels](#) in the American market and imposed duties of 31 percent on the imports, adding to earlier duties imposed under a department ruling that China unfairly subsidized its solar manufacturers.

American tower manufacturers have a parallel dumping case pending against Vietnamese tower makers, although they did not accuse the Vietnamese manufacturers of receiving unfair subsidies.

### **Wind’s Promise and Problems**

The development of wind power has two main problems. First, the wind does not blow all the time, so there must be backup power plants (often fueled by natural gas) ready to turn on instantly if the wind slackens.

One state that offers a potential solution is Hawaii, where its officials want 70 percent of energy needs to be met by renewable sources like the wind, sun or biomass by 2030. At a 30-megawatt wind farm in Oahu, where the wind supply is gusty and erratic, the plan is to install a 15-megawatt battery to smooth out the flow.

The Hawaii installation is designed to succeed at a crucial but obscure function: frequency regulation. The battery system can also be used for arbitrage, storing energy at times when prices are low and delivering it when prices are high.

The second problem with wind is that it sometimes blows the hardest in remote plains, far from cities that need the energy. In Texas, the leading state for wind power production (followed by Iowa and California), the wind is strongest on the mesas and high plains of West Texas, hundreds of miles from big cities like Dallas and Houston. Building transmission lines is expensive and difficult.

The idea of building wind farms offshore, in the sea, is gaining momentum. Putting turbines in the water is expensive, but the advantage is that the wind blows much harder off the coasts, and unlike wind over the continent, which often blows hardest at night, offshore breezes can be strong in the afternoon, matching the time when people are using the most electricity. Offshore turbines can also be located close to the power-hungry populations along the coasts, eliminating the need for new overland transmission lines. And if the turbines are built far enough from shore, they do not significantly alter the view — a major objection from many local opponents.

The lure of Atlantic wind is very strong. The Atlantic Ocean is relatively shallow, even tens of miles from shore, unlike the Pacific, where the sea floor drops away steeply. Construction is also difficult on the Great Lakes because their waters are deep and they freeze, raising the prospect of moving ice sheets that could damage a tower.

Nearly all of the East Coast governors, Republican and Democratic, have spoken enthusiastically about coastal wind and have fought proposals for transmission lines from the other likely wind source, the Great Plains.

Europe has already ventured into offshore wind territory — there are wind turbines off the coasts of Denmark, Britain and seven other European countries. China's first offshore wind farm is a 102-megawatt venture near Shanghai, with more in the pipeline.

In the United States, at least half a dozen offshore wind projects have been proposed in the shallow waters off the East Coast and the Great Lakes. But the projects face many hurdles. The proposal to build Cape Wind farm off Cape Cod stalled for nine years before the federal government approved it in 2010. The project pitted coastal Indian tribes, business interest and homeowners against the developer and proponents of alternative energy.

### **Cape Wind Project**

Cape Wind envisions turbines, each taller than the Statue of Liberty, stretching 25 miles in an area of Nantucket Sound called Horseshoe Shoal. The project would be about 5 miles off the coastline. It obtained a federal permit from the Interior Department in April 2010, setting it up to be the nation's first offshore wind farm.

The proposed project, whose cost is likely to exceed \$1 billion, [got its final government permit](#) in January 2011. [The next hurdle was selling the power](#). Initially, Cape Wind announced it had a deal to sell half the electricity to National Grid for a price beginning at 20.7 cents per kilowatt-hour, approaching double the national average retail rate. Massachusetts state regulators turned that down, but in November 2010, the state [accepted a contract](#) with National Grid at a price beginning at 18.7 cents a kilowatt-hour.

A spokesman for Cape Wind said that the company was negotiating with several utilities to sell the other half of the output and could not get loans to build the whole project until more of it was purchased.

Hurdles have also included lawsuits. Opponents of the wind farm have argued that the venture is too expensive and would interfere with local fishermen and wildlife, intrude on the sacred rituals and submerged burial grounds of two local Indian tribes and destroy the view.

Proponents of the project, which include major environmental organizations like the Sierra Club and Greenpeace, point to a study by Charles River Associates, a consulting firm hired by Cape Wind's developers, suggesting that the project could save New England ratepayers \$4.6 billion in energy costs over 25 years. They also say that the project has undergone two separate environmental impact analyses, neither of which found significant downsides.

### **Next: The Atlantic Wind Connection**

In October 2010, Google and [Good Energies](#), an investment firm specializing in renewable energy, each agreed to take 37.5 percent of the equity portion of a project known as the Atlantic Wind Connection. The project would create a 350-mile underwater spine that could remove some critical obstacles to wind power development.

The system's backbone cable, with a capacity of 6,000 megawatts, equal to the output of five large nuclear reactors, would run in shallow trenches on the seabed in federal waters 15 to 20 miles offshore, from northern New Jersey to Norfolk, Va. The notion would be to harvest energy from turbines in an area where the wind is strong, but the hulking towers would barely be visible.

[Trans-Elect](#), the Maryland-based transmission-line company that proposed the venture, said it hoped to begin construction in 2013. The company estimated that construction would cost \$5 billion, plus financing and permit fees. The \$1.8 billion first phase, a 150-mile stretch from northern New Jersey to Rehoboth Beach, Del., could go into service by early 2016, it said. The rest would not be completed until 2021 at the earliest.

Even before any wind farms were built, the cable would channel existing supplies of electricity from southern Virginia, where it is cheap, to northern New Jersey, where it is costly, bypassing one of the most congested parts of the North American electric grid while lowering energy costs for northern customers.

Generating electricity from offshore wind is far more expensive than relying on [coal](#), [natural gas](#) or even onshore wind. But energy experts anticipate a growing demand for the offshore turbines to meet state requirements for greater reliance on local renewable energy as a clean alternative to fossil fuels.

Industry experts called the Atlantic Wind Connection plan promising, but warned that as a first-of-a-kind effort, it was bound to face bureaucratic delays and could run into unforeseen challenges, from technology problems to cost overruns. While several undersea electrical cables exist off the Atlantic Coast already, none has ever picked up power from generators along the way.

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