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U.S. Leads World in Wind-Power Growth

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As Earth Day approaches, a new report finds that the United States is on track to breeze past Germany within two years as the world leader in installed capacity to spin the wind into electricity.

Globally, wind-power capacity rose 27 percent in 2007 to 94,100 megawatts, according to the report from the Washington D.C.-based Worldwatch Institute.

The U.S. led the charge with a record-breaking 5,244-megawatt increase for a total of 16,818 megawatts—enough to power 4.5 million U.S. homes.

And the potential in the U.S. is far greater, according to Janet Sawin, director of the Worldwatch Institute's energy and climate change program and author of the new report.

"Wind resources in just three U.S. states could, theoretically, meet all of our nation's electricity needs," she said in an email.

Technologically and economically, researchers believe wind could account for 20 percent of U.S. electricity by 2030.

Global Growth

Wind power is not without its critics.

Earlier this month, Governor Martin O'Malley of Maryland banned commercial wind turbines from state-owned land out of concern they would mar the landscape.

A proposed large-scale wind farm off the coast of Massachusetts' Cape Cod has been hobbled in controversy for years. And some environmental groups raise concerns that wind farms pose a risk to birds and bats.

(Read related story: "Plan for World's Largest Wind Farm Generates Controversy" [October 31, 2005].)

Despite the opposition, however, the U.S. is on track to have more wind turbines in the ground than anywhere else in the world.

Germany currently leads the world in installed capacity—22,247 megawatts, or about 24 percent of global capacity—but added just 1,667 megawatts in 2007, according to the new report.

Rising turbine prices and a dwindling supply of windy sites contributed to the country's slowdown. Nevertheless, wind still accounts for 7 percent of Germany's energy generation.

If the U.S. votes to extend a tax credit for renewable energy, the country will likely pass Germany in installed capacity within two years, Sawin said.

The tax credit is set to expire this year, but an extension appears to have wide support in the U.S. Congress, she noted.

"The key will be to do so soon enough that the wind industry does not lose momentum," Sawin said.

Europe as a whole accounts for 60 percent of global installed capacity. Spain led the continent in new installations, now with a total of 15,145 megawatts installed.

China added 3,449 megawatts of capacity in 2007 for an estimated 6,050 total megawatts.

Energy analysts said the growth is substantial, but wind still makes up only about one percent of the global mix. Other renewable energy sources like solar and geothermal make up even less.

"But if such rapid growth rates continue, which is likely, their contribution to the global energy mix will soon be significant," Sawin said.

Michael Carboy is a an analyst at Signal Hill, a financial services firm in San Francisco, California, that specializes in alternative energy companies.

He expects wind will make up about 12 percent of the global energy mix by 2025.

He attributed the energy's growth to "substantial operational credibility" among utility companies.

Hurdles Ahead?

However, as wind power continues to grow and gain market share, the energy industry will need to cope with the inherent fluctuation in wind.

"It's not like running a gas turbine or a coal plant where you turn the thing on and you set the speedometer to 100 percent and it runs at 100 percent," he said. "It varies."

Jeff Deyette is an energy analyst with the Union of Concerned Scientists in Washington, D.C.

He agreed that integrating wind into the electricity grid presents some technical hurdles, but they are not insurmountable with practices like day-ahead wind forecasts, he said.

A bigger hurdle, he noted, is the lack of transmission lines between some of the windiest regions of the world to the most populated cities where electricity demand is highest.

"If you're looking ahead to what challenges the wind industry is going to be facing in the next five to ten years, transmission is certainly at the top of anybody's list," he said.

Sawin noted that a similar challenge was met several decades ago when hydropower became a major part of the U.S. energy program.

"Also, many of the world's best wind resources are offshore and not that far from large urban areas," she said.

No Magic Bullet

Despite the current growth of wind power, the technology "is not going to be the proverbial knight in shining armor that's going to save us, the penguins, and the polar bears," Carboy, of Signal Hill, said.

(Read related story: "Most Polar Bears Gone By 2050, Studies Say" [September 10, 2007].)

Combatting global climate change requires a mix of clean energy sources such as wind, solar, geothermal, and tidal power, he noted.

Nor should one technology be relied on solely, Deyette said.

"Wind can supply a significant chunk of our energy resources," he said. "At a minimum the research shows it could supply up to 20 percent by 2030. So we should strive toward that goal."