

Wind power's payoff in Denmark

IT'S A GLOBAL LEADER IN THE TECHNOLOGY, AND TURBINES ARE A COMMON SIGHT, BUT CRITICISM AND CHALLENGES PERSIST

BY MARK HARRINGTON
 Newsday Staff Writer

NYSTED, Denmark - Well beyond the entrance to the harbor in this remote village on the southeastern shores of Denmark, the array of wind turbines looms like a band of synchronized swimmers, giant arms spinning soundlessly as a gentle wind rakes the coast.

At the Rogeriet Restaurant on a recent September afternoon, Lars-Bo Hilker sits at an outdoor table sipping a beer and gazing off into the distance. He comes here once a week, he says, and the turbines have become a welcome fixture in the view, particularly considering the alternative. "It's better than nuclear," he says.

A block away, at the Nysted Sail Club, Jorgen Elgaard uses a four-letter word to express his opinion of the 72 turbines erected four years ago. At night, the red blinking lights atop the windmills turn the waterscape beyond the harbor into a disco, he says - and the power comes at a premium he thinks is too steep - in Europe a few cents more a kilowatt-hour. "You'll get mad looking at all those red flashing lights," Elgaard says.

As new initiatives in offshore wind power gain momentum around the globe, including the first in U.S. waters proposed off the coast of Long Island and in Asia, the situation in Denmark provides an insightful window into the potential as well as the challenges of powering up with wind. The 40 turbines proposed off Long Island's South Shore by decade's end pale in comparison to the two hundred that line the Danish coasts, and the thousands that span the countryside. But many of the arguments, for and against, are the same,

if less fervently voiced here.

Dedication to its goal

General acceptance of wind farms, and a thriving market for wind-energy equipment around the world, has pushed Denmark to forerunner status in the global market.

Indeed, some days Denmark is choking on an abundance of wind power, so much so that it is forced to unload it at cost, or even at a loss, to neighboring countries. "On windy days and nights, we have too much electricity, and we can't get rid of it," said Henning Parbo, an economist at the western Denmark utility EnergiNet DK, an entity formerly known as Eltra. "It's known as the overflow problem."

Denmark embarked on an aggressive wind-farm program in the 1970s and 1980s, in part to help reduce its dependence on primarily coal-fired plants and address the global energy crisis. Today, it has 5,300 onshore wind turbines, with about 210 offshore.

With that capacity have come challenges. Wide and unpredictable fluctuations in wind patterns have kept those who maintain the grid forever on their toes because of a need to keep energy capacity constant, prompting criticism that the constant need for backup power from conventional plants defeats the goal of cutting emissions. Political pressures have led to a virtual moratorium on subsidies for turbines on land, and land-based turbine projects have ground to a halt as a result. But two new offshore projects, subsidized by price guarantees and payments even if the operators are forced to stop the turbines to stabilize the

electric grid, are certain to push the country closer to its goal of deriving nearly 40 percent of domestic power consumption from wind energy by 2025. In 2005, wind power contributed only 6 percent to domestic consumption.

But even as surplus wind supplies are sometimes sold at a loss, Danish citizens continue to pay a premium for wind power, and subsidies for new offshore initiatives have been "socialized" into the monthly electric bill.

"Who pays? The consumer pays, and we bring down the financial risk in order to get the lowest price" in bids to build the new wind farms, says Steffen Nielsen, head of section at the Danish Energy Authority's Ministry of Transport and Energy.

The wind-power industry wields vast political sway here, employing about 30,000 people and supplying about 40 percent of the world's wind turbines.

"It's a Danish industry, basically," said Peter Wenzel Kruse, a spokesman for Vestas Wind Systems, noting that most wind-equipment makers around the world use at least some parts made in Denmark. His company, which made turbines used in some of the earliest wind farms in California that saw mixed success in the 1970s and 1980s because of lower power outputs, large size and maintenance issues, is embarking on an effort to rejuvenate the image of wind turbines in the United States.

"The environment for wind power has never been better," Kruse said, noting unstable oil prices, global warming concerns and improved wind-turbine technology. "You've never had so many drivers at the same time."

Annoyance and acceptance

Here in Nysted, a village of cheddar-cheese-colored cottages and home to 1,200 people, turbines are generally accepted as part of the landscape. On a bus ride into town, visitors are presented with a jarring array of more than a dozen land-based turbines rising high above local farms and tree lines.

When the offshore-based turbines were first proposed early this decade, locals say, concerns were allayed because the eight rows of nine turbines 360 feet high were more than 6 miles from land.

"It wasn't supposed to be visible, so we didn't have a problem with it," said Helle Teper, who runs the local tourist office. "But when they built the [wind] farm, people became angry because we can see the farm."

Those concerns have subsided, Teper said: "The funny thing about the Danes is that when things are here we learn to live with them, and we learned to live with it." Her office now shares a building with a wind-farm museum, complete with a wind-tunnel simulator and tiny models of the turbines, sponsored by the three energy companies that own them: Energi E2, Dong Energy and Swedish Sydkraft. There are even boat tours out to the turbines, and a new array of as many as 92 turbines is scheduled to be built here before the end of the decade.

Sven Erik Hauberg, the harbor master at Nysted, said complaints about the wind farm have come from some German sailors, who cited a lack of information and who didn't know they could sail through instead of around it. Complaints also have come

from residents who are tired of the lights, he said, though the energy companies have promised to install new, less intense lighting.

The fishing industry here, Hauberg said, is somewhat limited, consisting primarily of eels, and also hasn't been affected. "Fishermen have never fished here because there are no fish," he says.

View from the beach

But Denmark is no Long Island, and Nysted is no Jones Beach. Over on the western coast, the city of Blavand, with its 80 turbines located eight miles from a mile-long stretch of public beach in a project known as Horns Rev, better approximates the environment of the Long Island project.

Blavand Strand is a picturesque stretch of beach on the North Sea, set against a backdrop of dunes and roads with thatched-roof cottages and a lighthouse. From nearly all points on the long, expansive beach, the turbines remained a looming, if distant, presence, though few of those visiting on a late September day seemed disturbed by it.

"It doesn't bother me. I like the view," said Tove Homilius of Grinsted, Denmark, walking the beach with her husband, Christian. She favors wind energy, she said, because of the potential for reducing greenhouse gases, though there are limits to her fondness. "I wouldn't want to live nearby one," she said of land-based turbines, which she said are noisy and obtrusive. "We find it better at sea," added Christian Homilius.

Struggle to balance the grid

Parbo, the economist at Energy Net D.K, the western Denmark utility, acknowledges that the ability to export excess energy, or draw from other countries to stabilize the grid, is critical to maintaining stability in

Denmark.

"We have to secure a balance every minute," given the intermittency of wind, he said. "If we didn't have that, we would be in very serious trouble within our system."

EnergiNet DK monitors about 4,000 megawatts on its system, with as much as 2,000 of that coming from wind power at its peak, Parbo said. "We have very high imbalances compared to the size of our system," he said, something that is "challenging" but not impossible "if you have the means to get rid of it." Asked about the 140 megawatts LIPA's proposed windmills would introduce on system that peaked out this summer at 5,788 megawatts, Parbo said, "It wouldn't worry me."

Has ecology benefited?

Parbo said he views the two new offshore wind farm initiatives here as primarily political ones. "It has simply been decided that we should have [more] offshore capacity within 10 years," he said. "I don't mind if it's built or not - if potential investors were faced with real costs. The problem is, they are handled outside the existing system" through government subsidies.

In Copenhagen, where the Danish Energy Authority offices are located on a harbor just miles from the Middelgrunden wind farm of 20 turbines, section head Nielsen was equivocal on the topic of whether wind farms have substantially reduced emissions.

"Wind power, fit into the system and utilized, obviously would prevent producing from fossil fuels, and yes, it mitigates climate change," he said. "But even though we produce full capacity of wind power, if there's demand for power in neighboring countries in the Scandinavian power market, fossil fuels will produce as well."

There have been other costs. Nielsen noted that in areas such as Horns Rev, where bottom trawling is no longer allowed around the turbines, fishermen have been compensated for their long-term losses. And though line fishing is allowed, he said the reduction of fishing overall within the Horns Rev wind farm has created a "kind of sanctuary" where certain fish thrive.

From a baseline study begun with the first large-scale offshore wind farm in 1999, Denmark has reached certain conclusions about the collective impact of the turbines over seven years. In Horns Rev, feeding activity of harbor porpoises, after initially declining, has now returned to pre-wind farm levels, Nielsen said. Seals in every location, he said, "we can almost definitely say seem not to be affected at all."

Investigators found that migrating birds "seem to avoid collision" with turbines, Nielsen said, though they have not been able yet to document whether habitat for the common scoter, a sea duck, has declined. Three years after construction, "a limited number of these birds have been observed inside the wind farm, so [whether] an actual re-habitation is ongoing is still an open question," Nielsen said.

Although investigators in Britain are looking into wind farms' possible interference with radar systems, Nielsen said no such interference has been detected or complained of in Denmark.

For a country that has aggressively pushed wind power, Denmark still considers itself new to the offshore sector, Nielsen said.

"The industry is just beginning to move offshore, and still there are lessons to be learned," he said.

MONDAY FOCUS

Wind energy capacity, global and local

Worldwide, installed wind power capacity has reached 59,322 megawatts, an increase of 25 percent over 2004.

The United States ranks third among countries in installed capacity: Germany is first and Spain, second. Fourth and fifth are India and Denmark, respectively.

LIPA's proposed offshore wind park would consist of 40 turbines expected to generate 140 megawatts of electricity - enough to power 44,000 homes at peak capacity.

SOURCES: GLOBAL WIND ENERGY COUNCIL, LIPA

The Danish model

The Nysted Offshore Wind Farm, located 100 miles southeast of Nyborg, Denmark, produces enough electricity to power 110,000 homes.

- Operational: 2003
- Location: 7 miles offshore
- Total area: 15 square miles
- Water depth: 20-30 feet
- Turbines: 72
- Hub heights: 225 feet above sea level
- Blade length: 131 feet
- Rotor diameter: 270 feet
- Connecting cables: Single 33-kilovolt connects all turbines to transformer station
- Cable to land: 132 kV, running from transformer station to land

Copyright 2006 Newsday Inc.