

## South Carolina tests the waters of offshore wind farm

Aug. 23--South Carolina's entry into the high-stakes race to build an offshore wind farm began quietly this year when crews placed two strings of yellow buoys off the Grand Strand.

Packed with weather instruments, these buoys will measure wind speeds to identify a sweet spot, a place close enough to shore so crews can more easily build and maintain a wind farm, but far enough into a powerful belt of winds that regularly blows off the coast -- winds strong enough to spin massive rotors on towers taller than the Statue of Liberty.

The data from these buoys has begun to trickle into a lab at Coastal Carolina University, a partner in the wind power project with Santee Cooper and the South Carolina Energy Office.

So far, the buoy project has cost \$430,000, with Santee Cooper chipping in \$229,000 and the rest coming from a U.S. Department of Energy grant.

If the buoys find that sweet spot, Santee Cooper says that in a few months it plans to spend another \$500,000 to \$1 million to build a larger platform to gather more wind-speed data at taller heights. With that information in hand, Santee Cooper then would seek financing and government permits for an 80-megawatt wind farm with generators capable of powering 40,000 homes.

Santee Cooper officials say the project positions South Carolina as a leader in the rapidly emerging offshore wind industry, a business that's expected to create thousands of new jobs while capturing enormous amounts of locally generated electricity. But is South Carolina doing enough?

A review of offshore wind plans in other states shows that South Carolina's effort remains modest at best. More ambitious projects in the Northeast and Mid-Atlantic are rapidly gaining steam and have strong political muscle -- support that South Carolina lacks, industry experts and government officials say.

If South Carolina wants to be a player in the emerging wind-power industry, it needs to move quickly to recruit wind-power manufacturers and build an ocean-based wind farm of its own.

Offshore wind power is coming, said John Clark, head of the state Energy Office. "The question is, how soon it will happen in South Carolina compared to other places?"

The state's commitment to wind power looks particularly puny when compared with the more than \$100 million that South Carolina government and business groups have poured into hydrogen fuel cells, or the more than \$245 million that Santee Cooper already has spent on its ambitious plans to build a \$1.2 billion coal plant in a rural area along the Great Pee Dee River.

Santee Cooper says that even if all its studies show offshore wind is a financially viable energy source, the utility doesn't expect to have any turbines spinning for four years or more.

"We are not racing to build the first offshore wind turbines," Lonnie Carter, president and chief executive officer of Santee Cooper, said in a speech in March to unveil the buoy project. "... This is a marathon, and we will consider each step forward very carefully."

As the debate swirls about the state's future energy needs, one thing has become clear: South Carolina is a lousy place to build a large wind farm.

On land, that is.

Three years ago, the Energy Office hired a consultant to map wind speeds across the state.

Using existing weather data and sophisticated computer-modeling techniques, researchers estimated that wind speeds average less than 10 mph on state soil -- too low to efficiently turn

today's huge wind turbines.

But it's an entirely different story just off the Carolina coast.

Head east in a boat, and you'll soon feel winds pick up, and the farther you go offshore, the stronger the breeze. These winds form a powerful belt of potential energy, the equivalent of a giant offshore oil reserve. The Department of Energy thinks wind farms off South Carolina could generate 5,000 megawatts in 22 years, the equivalent of about four new nuclear reactors or eight coal plants.

This reservoir of wind is about 20 miles offshore from Charleston Harbor but dips closer to the coast south of Pawleys Island near Winyah Bay. Just a few miles off the bay, winds average 17 to 19 mph, according to the latest wind-speed computer models. That's as good as or better than some windy areas in the West and Great Plains.

South Carolina has another advantage: Its coastal waters are relatively shallow, said Paul Gayes, director of Coastal Carolina's Center for Marine and Wetland Studies. In California, you'll find yourself in deep water just 500 feet offshore, but South Carolina's waters have a gradual slope toward the continental shelf, he said. Depths are less than 60 feet for 15 miles or more.

That makes it easier and less expensive to build wind turbine platforms, he said. "So the question is, how far (offshore) do you go?"

Other states moving fast The East Coast's offshore-wind belt stretches from Charleston to Maine, and many states are racing to harvest this energy, with the 420-megawatt Cape Wind project off Cape Cod, Mass., leading the pack.

Earlier this year, Cape Wind cleared state and local regulatory hurdles despite opposition from U.S. Sen. Ted Kennedy and other well-heeled residents near Cape Cod who said the towers would be eyesores and threaten fishing grounds.

The billion-dollar project still needs permission from the U.S. Department of Interior, which under the Obama administration has signaled strong support for renewable energy. Should the project's leaders get that approval, they hope to have turbines spinning within two years.

Elsewhere, a consortium in New Jersey is pushing hard into the offshore-wind arena with a 350-megawatt project 16 to 20 miles offshore. Another group is working on a 450-megawatt project 11 miles off Delaware. And in Rhode Island, Gov. Donald Carcieri has been particularly energetic in his campaign to build a wind farm off Block Island by 2012, frequently touting the catchphrase, "Spin, baby, spin," at public events.

"Once the first one gets done, then you'll see things take off," said Nick Rigas, director of Clemson University's Restoration Institute. Rigas also is a vice president for EcoEnergy and led efforts to build more than 3,000 megawatts of wind power in Arizona and the Midwest.

Rigas said Denmark, a country with the same size population as South Carolina, is a model of how the wind-power industry can transform an economy.

Denmark began its offshore-wind push in the late 1980s partly because of concerns over emissions from coal-fired power plants.

Today, Denmark gets 20 percent of its energy from wind, and its wind-power industry, led by Vestas and other equipment manufacturers, is the world's largest.

"They took a U.S. technology that we abandoned and took it to new heights," Rigas said.

Rigas predicts wind-manufacturing hubs soon will spring up along the East Coast, creating thousands of jobs in manufacturing and marine-equipment industries. South Carolina has another advantage here: General Electric, the largest supplier of wind turbines in the United States, makes them in its plant in Greenville. Several of GE's suppliers also have built factories nearby.

"There's a cluster, so the key is to build on that cluster. And what better place is there than Charleston or Georgetown, where you could build these components, put them on ships and send them across the world?"

But Rigas said the state still lacks a strong strategic and political emphasis on this potential

economic windfall.

"The industry is going to start emerging in the next five years," he said. "Once that window closes, the opportunity will be lost."

South Carolina's project Santee Cooper's relationship with coal runs deep. Its coal-fired generators burn 9 million tons a year, enough to fill a coal train stretching from Charleston to New York. Santee Cooper's relationship with wind has more shallow roots.

Two years ago, the state-owned utility put up a wind monitor near Georgetown and found winds weren't strong enough to justify a land-based wind farm.

On March 9, in a news conference in downtown Georgetown, officials with Santee Cooper, Coastal Carolina and the state Energy Office unveiled their buoy plan. This site-specific data will help validate (or invalidate) the state's offshore-wind-map estimates.

"We're about to find out if Palmetto winds can do the job," Carter, the Santee Cooper president and CEO, said in his speech.

Carter took a measured approach about wind power, telling the audience that Santee Cooper's primary goal was to study the issue. Building an offshore wind farm won't be easy, even if the data says the winds are strong enough. He cited the lack of state and federal guidelines and the need for in-depth studies on fish, birds and other wildlife.

"Another consideration is cost," he said. "Wind energy is not free. The machinery to harness wind is expensive to build and to maintain in the rough ocean conditions."

And there's the matter of building transmission lines from the platforms to the coast.

"We anticipate that some people will oppose the installation of offshore wind turbines," he added. "Please know that if we progress to the point of a wind farm proposal, the public will be involved and all voices will be heard and considered."

It's understandable that Carter would be concerned about public reaction, considering the agency's experience with its plan to build a new coal plant. The Pee Dee plan generated widespread opposition and legal challenges from critics who say coal plants contribute to global warming and pollute rivers and streams with mercury, a potent neurotoxin. Some of Santee Cooper's biggest customers, the state's rural electric co-ops, are threatening to buy power from another utility because of the Pee Dee plan.

Some argue that Santee Cooper's full-court press to build the coal plant has put the agency in a potentially difficult leadership position -- that the more the agency pushes for a large offshore wind project, the less viable the coal-plant option becomes.

Santee Cooper officials disagree, saying they need a more robust and consistent source of power by 2013 and that the Pee Dee plant is the best bet to fill the state's needs by then.

Leading the charge One of the biggest hurdles for offshore wind projects has been their appearance.

Offshore wind turbines are gigantic and getting bigger. A single General Electric wind turbine can generate 3.6 megawatts, enough to power 1,700 homes. Today's larger turbines stand nearly 400 feet above the water. From tip to tip, a rotor can be as long as a football field. A GE executive recently told state officials that building a wind turbine was like putting an M-1 tank on a pole.

Santee Cooper is looking at sites 1 1/2 to 6 miles offshore. For the most part, wind turbines vanish into the horizon and haze when they're 15 to 20 miles offshore.

Why not bypass that issue and look farther offshore, where the winds are stronger anyhow?

Marc Tye, Santee Cooper's vice president of conservation and renewable energy, said it will cost more to build and service a wind farm that's far away from shore and that it will be more expensive to bring that electricity back.

At this point, though, he's unsure how much the project will cost no matter where it goes, estimating

that an 80-megawatt wind farm could cost anywhere from \$300 million to \$500 million.

Tye said that in addition to an in-depth analysis of a wind farm's costs, the utility needs to better understand how a wind farm will affect Santee Cooper's electric grid on days when winds are low. Studies also need to be done on how turbines would hold up in a hurricane and the geology of the seabed where a wind farm might be located. All this will take years to accomplish, he said.

Still, Tye said the agency's board "is dead serious" about exploring wind power's potential.

As researchers with Coastal Carolina and Santee Cooper study the data collected by their buoys off the Grand Strand, state officials and grass-roots groups hope the wind-power movement will gain more momentum.

The state Energy Office hopes to land a major federal grant. The State Ports Authority has set aside more than 20 acres for an unidentified "alternative-energy project" at its terminal complex at the former Charleston Naval Base, and some say Charleston's waterfront would be a perfect place for a wind manufacturer to set up shop.

"South Carolina spends \$20 billion a year on energy, and we don't produce any fuel in South Carolina," said Clark of the state's Energy Office. "We'd like to keep more of that money here."

But Delaware, New Jersey, Massachusetts and other states are further along, he said. "The green revolution in the nation and the world is coming, whether we in South Carolina do anything or not. So the question is, do we get on the crest on the wave and reap the benefits, or do we move along at a slower pace and be resistant?"

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