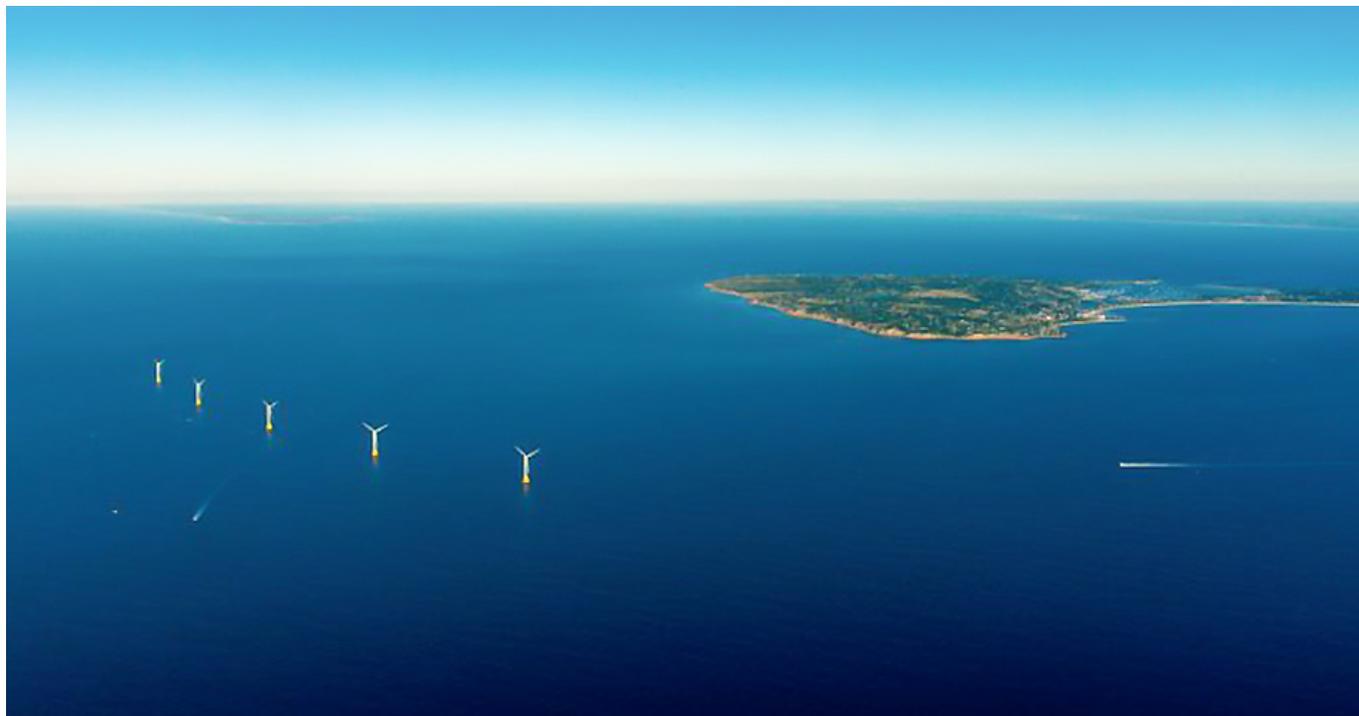


THE TRANSFORMATION OF THE ENERGY SECTOR

OFFSHORE WIND

DOE, N.Y. drill down on lowering industry costs

Saqib Rahim, E&E reporter • Published: Monday, September 10, 2018



A new public-private consortium aims to reduce the cost of offshore wind in the United States. The Block Island wind farm is pictured. Deepwater Wind

Over the last decade, Europe has turned one of the most expensive technologies for power generation — offshore wind — into a commercial technology that may be on the brink of going subsidy-free.

Now, a new public-private effort in the United States is going to attempt the same trick, but with a distinctly American spin.

In June, the U.S. Department of Energy selected New York to lead a national "consortium" whose mandate is to cut the cost of offshore wind in the United States. The group, starting with an endowment of \$41 million, will have a board made up of representatives from the public, private and research sectors. They'll have wide discretion in funding the technology research and development — catered to the United States' unique conditions — that they judge to have the best potential for reducing cost across the industry.

"We're trying to foster this kind of collaboration that doesn't necessarily happen organically," said Alana Duerr, offshore wind lead for the Wind Energy Technologies Office at DOE. "As a department, we're always making sure that we're investing in technologies and investing in research that will bring down the cost so that it can be economically viable without subsidies."

The New York State Energy Research and Development Authority (NYSERDA) won the award in a competitive solicitation that DOE announced in December. Both agencies will guide the program in its initial, four-year phase. They're currently hammering out the details of exactly how the program will be designed, with a goal of launching the program by the end of this year.

It's also an indication that at least some in the White House see the U.S. offshore wind industry as close to maturity — and thus ripe for a public-private collaboration that gets it out of subsidy territory.

The consortium will start with a 50-50 cost share between federal and state governments; the eventual goal is to make it financially independent. And its research and development scope runs widely, from high-risk research to near-term technology that could be operating on wind turbines off U.S. coasts in the next five to 10 years.

One of the program's advisers is the Carbon Trust, a London-based environmental consultancy that has helped administer a similar effort in Europe. The Offshore Wind Accelerator, formed in 2008 by the Carbon Trust, the U.K. government and five offshore-wind builders, claims its R&D portfolio has helped the industry emerge as a major renewable-energy provider in Europe.

The idea for the cooperative "accelerator" might not have been intuitive back then: Why would five companies, each trying to slash the others' throats in the marketplace, work together on technology? Megan Smith, a senior manager at the Carbon Trust, said they realized their fortunes were bound together.

"There are two ways to look at it. Yes, they're all competitors, or you can see they're actually all on the same team, trying to reduce the cost, therefore increase the market, at the expense of other generation types," Smith said. "If we do not reduce the cost, there is not going to be a market there for anyone to partake in."

How to reduce cost was another matter entirely. An offshore wind turbine contains 8,000 parts, from beefy steel turbines to highly machined gearboxes and electromagnets. The turbines are made onshore, which can be expensive in its own right, but then they're shipped out to sea and installed by highly specialized ships and crews.

The menu of cost-reduction options was staggering. And so the accelerator's directors targeted four key areas that they thought would have the most impact: the foundations that connect turbines to the seabed; the vessels that move engineers out to sea; installing the cables that get power to shore; and studying wind resources and how they're affected by having many turbines grouped together. A fifth research area, electrical systems, has since been added; together, these areas account for 70 percent of the levelized cost of electricity from an offshore windmill.

Conservatively, the Carbon Trust estimates, this work has reduced the levelized cost of electricity from offshore wind by at least 10 percent since the accelerator's founding a decade ago. Smith points to its work on foundations, the gigantic steel structures that hold the machine up. Research funded by the accelerator looked at soil in the seabed and found that the towers could be made less conservatively — becoming lighter towers that use less steel.

Smith thinks this has played no small role in Europe's emergence as the world leader in offshore wind. As of year-end 2017, Europe had 16 gigawatts of offshore wind built (for reference, the United States has 30 megawatts). Last year, DONG Energy (which has since changed its name to Ørsted A/S) won a German auction with a project it claimed would require no subsidy, as it penciled out through electricity sales alone.

But where Europe learned its lessons over a decade, Smith believes the United States can ramp up even faster. "In the U.S., the aim is very, very high deployment, very quickly," she said. "I think there's a huge opportunity in the U.S. to have a real, tangible, impressive impact."

Wind's terroir

Of course, it's not as simple as importing the machines made in Europe.

Late in the Obama administration, DOE and the Interior Department grappled with the question of how to scale up the U.S. offshore wind industry. What they found was that American waves, wind and soil all differed from Europe's in important ways. In the United States, the water gets deeper closer to shore than in Europe, where it can stay shallow a fair way out. The soil was weaker in some places, which mattered for how you locked the turbine in and where you put the cable. And unlike the North Sea, the Atlantic has hurricanes — blustering menaces that could beat up a wind turbine if it weren't designed right.

Each nuance implied cost. But for all the idiosyncrasies of the U.S. market, the departments concluded in a 2016 report, there was significant room to reduce costs through R&D. By 2030, levelized costs of electricity could potentially be reduced by half, they said.

So last December, Energy Secretary Rick Perry issued a funding announcement for a consortium meant to find these cost reductions and attack them ruthlessly. The consortium design wasn't an accident. It was meant to foster communication between the smartest people in offshore wind — whether in industry, academia or government labs — and define the technology challenges that could profit the whole industry.

As Mark Torpey, director of technology and business innovation at NYSERDA, put it, the mission is "to invest the money smartly in things that really will reduce the cost, end of the day, for consumers, and focus in on those research projects to get the job done."

NYSERDA's job is technically to advance R&D that will benefit offshore wind everywhere in the United States, including off the West Coast, where a fairly young technology, floating turbines, is considered more suitable. But Torpey can't help but express a bit of parochialism. He points out that New York has a goal of deploying 2.4 GW of offshore wind by 2030. If project costs were to come down just 9 to 10 percent, he said, "roughly speaking, it's about \$100 million a year savings to New Yorkers."

How, exactly, to get those savings? That's one of the many questions that DOE and NYSERDA are still working out in the program's design. For now, Torpey and others said, there are some rough guidelines.

There will be a board of directors, of some 20 to 30 people, representing technology expertise from the public, private and research sectors. This board will decide what projects to pursue.

Three priority themes have already been set by DOE: improving wind turbine systems; getting better at measuring wind resources and studying sites; and improving the technology used for operations, for maintenance and in the supply chain. But the aim is also to stay dynamic: to stay on top of new issues that arise in the industry, pivoting where necessary.

Beyond that, many other parameters are still being finalized. The consortium will fund a mix of short- and long-term R&D, but the precise balance remains to be seen. The one unifying characteristic, Torpey said, is that cutting cost will be the organization's "North Star."

Advertisement

The essential news for energy & environment professionals

© 1996-2018 Environment & Energy Publishing, LLC [Privacy and Data Practices Policy](#) [Site Map](#) [Contact Us](#)