

## More Than 120,000 Acres of Offshore North Carolina Up for Lease

As part of President Barack Obama's Climate Action Plan to create American jobs, develop domestic clean energy sources, and cut carbon pollution, U.S. Secretary of the Interior Sally Jewell and Bureau of Ocean Energy Management (BOEM) Director Abigail Ross Hopper recently announced a proposed lease sale for 122,405 acres offshore North Carolina for commercial wind-energy leasing.

The proposed lease is for the Kitty Hawk Wind Energy Area, which BOEM identified in consultation with members of its North Carolina Intergovernmental Renewable Energy Task Force. The task force includes membership from federal, state, tribal, and local government partners. In addition, BOEM considered information gathered through outreach with stakeholders.

"This is an important and exciting milestone in our ongoing efforts to tap the vast wind-energy resources along the Atlantic Coast," Jewell said. "The proposed lease sale is the result of thoughtful collaboration at all levels to identify areas offshore North Carolina with great wind-energy potential, while minimizing conflicts with other important uses. We will continue to work with the North Carolina Renewable Energy Task Force, local communities, and key stakeholders as we move forward with harnessing clean-energy resources, generating jobs, and stimulating local economies."

The area proposed for leasing is the same as the Kitty Hawk Wind Energy Area (WEA) that BOEM announced on August 11, 2014. This WEA begins about 24 nautical miles from shore and extends about 25.7 nautical miles in a general southeast direction.



Its seaward extent ranges from 13.5 nautical miles in the north to 0.6 of a nautical mile in the south. It contains 21.5 outer continental shelf blocks. BOEM also announced the Wilmington East and Wilmington West WEAs, which, due to their proximity and shared attributes, have been coupled with the planning and leasing process for the South Carolina Call Areas.

A "Proposed Sale Notice (PSN) and Request for Interest (RFI) for Commercial Leasing for Wind Power on the Outer Continental Shelf Offshore North Carolina" was published in the Federal Register August 16, and includes a 60-day public comment period ending October 17.

This document provides detailed information concerning the area available for leasing, the proposed lease provisions and conditions, auction details (e.g., criteria for evaluating competing bids and award procedures), and lease execution. It includes

an RFI to assess whether there has been a change in competitive interest in the area since the publication of the North Carolina Call for Information and Nominations ("Call") in 2012.

"This is a great day for North Carolina and our country as we continue to make progress on diversifying our nation's energy portfolio," Hopper said. "With the completion of a successful lease sale, North Carolina will move closer to obtaining substantial contributions to the region's energy supply from offshore wind. Additionally, such supply will assist local governments in achieving their renewable energy goals."

In order to participate in the lease sale, potential bidders whom BOEM has determined are qualified to hold an OCS lease for commercial wind offshore North Carolina must submit a response to this notice by the end of the 60-day comment period, affirming their continued interest in the area being offered for leasing.

Companies interested in participating in the lease sale that have not been qualified by BOEM must submit the required qualification materials by the end of the 60-day comment period for this notice. Companies planning to submit a qualification package are encouraged to submit as early as possible during the comment period to ensure adequate time for processing. The PSN provides additional information about qualification requirements.

To be eligible to participate in the lease sale, each company must have been notified by BOEM that it is legally, technically, and financially qualified by the time the final sale notice is published.

If BOEM determines that competi-

itive interest in the proposed lease area still exists, BOEM will proceed with the competitive process. If BOEM determines competitive interest in the proposed lease area no longer exists because only one potential lessee is interested in the area, BOEM may proceed with the non-competitive process and negotiate the terms of the lease directly with the interested company.

Comments received electronically or postmarked by October 17 will be available to the public and considered before the publication of the final sale notice, which will announce the time and date of the lease sale.

The announcement builds on BOEM's work to foster offshore renewable energy development through a

collaborative state-federal process to identify WEAs and hold competitive lease sales. BOEM has awarded 11 commercial offshore wind leases, including nine through the competitive lease sale process (two offshore New Jersey, two in an area offshore Rhode Island-Massachusetts, another two offshore Massachusetts, two offshore Maryland and one offshore Virginia). These lease sales have generated about \$16 million in winning bids for more than a million acres in federal waters. ↴

*Source: U.S. Department of the Interior*

For more information, go to [www.doi.gov](http://www.doi.gov)

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## **NREL Study Provides Clean-Energy Insights in the Eastern Power Grid**

A new study from the United States Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) used high-performance computing capabilities and innovative visualization tools to model, in unprecedented detail, how the power grid of the eastern United States could operationally accommodate higher levels of wind and solar photovoltaic generation. The analysis considered scenarios of up to 30 percent annual penetration of wind and solar.

Whereas previous studies have investigated operations in one-hour intervals, NREL's Eastern Renewable Generation Integration Study (ERGIS) analyzed a year of operations at five-minute intervals, the same real-time interval used by grid operators for scheduling resources.

"By modeling the power system in depth and detail, NREL has helped reset the conversation about how far we can go operationally with wind and solar in one of the largest power systems in the world," said the Energy Department's Charlton Clark, a DOE program manager for the study. "Releasing

the production cost model, underlying data, and visualization tools alongside the final report reflects our commitment to giving power system planners, operators, regulators, and others the tools to anticipate and plan for operational and other important changes that may be needed in some cleaner energy futures."

### **HIGH-RESOLUTION MODEL**

For the study, NREL produced a high-resolution model of the entire Eastern Interconnection, including Canada, an important power-trading partner with the United States. NREL modeled more than 5,600 electricity generators and more than 60,000 transmission lines in a power system that spans from Florida to Maine and portions of Canada and as far west as New Mexico.

ERGIS considered four hypothetical scenarios to analyze how the Eastern Interconnection might function in 2026, when the power system could have significantly less power generation from fossil fuels.

The scenarios vary according to how wind, solar, and natural gas are used to replace the fossil-fuel generators. The scenarios also differ according to the amount of new transmission lines that are assumed. Simulations occur in a modeling framework that mirrors the security constrained unit commitment (SCUC) and economic dispatch (SCED) process used by system operators. The SCUC and SCED determine the operation of the power system according to a variety of constraints, including marginal costs and defined operating reserve requirements. The capital costs, land use and siting, market design, gas pipeline, and other factors that would need to be addressed under the scenarios were not considered. This study also did not look at all aspects of reliability considered by system planners and operators, including system dynamics and AC power flow.

"Our work provides power-system operators and regulators insights into how the Eastern Interconnection might operate in future scenarios with

more wind and solar energy,” said Aaron Bloom, NREL project leader for the ERGIS study. “More importantly, we are sharing our data and tools so that others can conduct their own analysis.”

Among other findings, ERGIS shows that as wind and solar power generation increase:

**The operation of traditional power sources (such as coal, natural gas, and hydropower) changes** — Turning up or down more quickly to accommodate seasonal and daily variations of wind and solar in order to maintain the balance between demand and supply. In addition, traditional generators would likely operate for shorter periods of time as wind and solar resources meet more of the demand for electricity.

**Flows of power across the Eastern Interconnection change more rapidly and more frequently.** During periods of high wind and solar generation (for example, 40 percent or more of daily load), model regions trade frequently and in large volumes according to new net load patterns.

**Regulatory changes, market-design innovation, and flexible operating procedures are important to achieving higher levels of wind and solar.** Looking at a year of operations at a five-minute level, ERGIS shows

that the power system can meet loads with variable resources — like wind and solar — in a variety of extreme conditions. However, technical feasibility depends on other transmission and generation operators providing the necessary ramping, energy, and capacity services; wholesale market design changes; and various capital expenditures, all of which will have financial and other implications that may need to be addressed and were outside of this study.

### ANALYSIS FAST FACTS

- The maximum penetration of wind and solar was 60 percent over a five-minute interval.
- The maximum annual curtailment of wind and solar was 6.2 percent.
- Wind and solar generation result in a 30-percent reduction in generation and commitment from coal and natural gas plants in the high wind and solar scenarios.
- Over the baseline scenario, CO<sub>2</sub> emissions were reduced by up to 33 percent annually in the high wind and solar scenarios.

### PEREGRINE SUPERCOMPUTER

NREL developed new modeling and analytical approaches that were

executed using Peregrine, the lab’s ultra-efficient supercomputer. Peregrine has a peak performance of 2.25 petaflops (2.25 million billion calculations per second). That combination of computing power and innovative modeling techniques enabled NREL to remove simplifying assumptions included in other power-systems models, increase fidelity of the modeled results, and reduce the processing time for ERGIS calculations from 19 months on a desktop computer to 19 days. The ERGIS team also took advantage of additional resources in NREL’s Energy Systems Integration Facility.

“We developed visualization tools that allow us to see how energy moves through the grid in space and time, and through those tools we could see patterns and events that weren’t visible in the static data points and plots,” Bloom said.

This study was funded by the Energy Department’s Office of Energy Efficiency and Renewable (EERE) and the Office of Electricity Delivery and Reliability (OE). ↴

Source: NREL

For more information, go to [www.nrel.gov](http://www.nrel.gov)

## Business Network for Offshore Wind Opens Office in New Jersey

On the sixth anniversary of Gov. Chris Christie’s signing the Offshore Wind Economic Development Act, the Business Network for Offshore Wind, a leader in building the U.S. offshore-wind supply chain, announced the opening of its Woodbridge, New Jersey, office.

“By expanding to New Jersey, which has the potential to provide more than 4 GW of offshore wind power, the Network can continue building a U.S. offshore wind-supply chain, generate additional job opportunities for members and strengthen the emerging U.S. offshore wind industry,” said Ex-

ecutive Director Liz Burdock.

“New Jersey has a world-class wind resource far off the shore that can deliver clean, reliable power right where we need it, and the most potential for Atlantic states with current BOEM offshore wind leases,” said Doug O’Malley with Environment New Jersey.

Four months after the Bureau of Ocean Energy Management announced New Jersey’s 344,000 acres of two wind-energy areas, RES Americas, Inc. and U.S. Wind Inc. bid nearly \$2 million in November for the offshore leases. Now, after a

transfer of the lease this spring, Dong Energy, the world’s largest owner of offshore wind, announced plans to construct Ocean Wind, a 1,000-MW wind farm 10 miles off Atlantic City. Additionally, Fishermen’s Energy again won a competitive Department of Energy grant as it moves closer to construction of six turbines off Atlantic City as a ready-made demonstration project.

“Ecology & Environment is a strong supporter of offshore wind development in the United States and is excited that the Business Network is expanding its capable reach into New

Jersey,” said Kris Ohleth with Ecology & Environment. “We have seen the positive influence the Network has had in Maryland and look forward to their support in New Jersey. We look forward to working with them to cultivate our state’s supply chain and offshore wind development.”

Matthew Greller, who was involved in passing the New Jersey Offshore Wind Economic Development Act in 2010, will be the New Jersey director of the Business Network for

Offshore Wind. Greller also serves as Of Counsel with Cleantech Law Partners, a boutique law firm specializing in the renewable energy field. Ross Tyler, formally director of Clean Energy for the Maryland Energy Administration, will continue to lead the Maryland Network Office.

The Business Network for Offshore Wind is a 501(c)(3) organization dedicated to creating jobs, strengthening the economy, and improving quality of life through offshore wind. The

Network is focused on delivering education, creating partnerships, and advancing the industry. All proceeds are used to support the industry by helping the Network continue education, develop tools, and networks necessary to create a U.S. offshore-wind supply chain. ↵

*Source: Business Network for Offshore Wind*

For more information, go to [www.bizmdosw.org](http://www.bizmdosw.org)

## Thai Wind Investments Come to Fruition

Modern Energy Management (MEM) worked with Gunkul Engineering, a leading Thai renewable electricity producer, to bring three wind projects to financial close. The three wind farms would contribute 170 MW to the grid — nearly doubling Thailand’s total wind-energy capacity.

MEM, a specialist in delivering project lifecycle certainty to renewable energy developers, financiers, and investors, served as the owner’s representative on the 60-MW Wayu, 60-MW Greenovation, and 50-MW Korat Wind projects. The firm is now acting as owner’s engineer for construction on the Wayu project and will fill the same role on the Korat Wind project.

Over the next two decades, Thailand’s energy consumption will increase by 75 percent. At the same time, however, much of its current energy infrastructure is to be decommissioned, while its natural gas reserves are expected to run out by 2021.

Faced with these energy supply-and-demand challenges, Thailand is aiming to secure 25 percent of its energy from renewable sources by 2036. As part of these efforts, the country has dramatically increased its wind-power capacity over the past five years — from 5.6 MW in 2010 to 234.5 MW in 2015.

However, in order to realize its goals, Thailand must make the most of its available wind resources and take ad-

vantage of the latest technology.

Since all three projects are in medium- to low-wind-speed areas, the wind farms use innovative new IEC Wind Class 3 turbines, which are specially designed to maximize efficiency and output in limited wind regimes. By combining a larger rotor with the ability to select from a range of taller tower heights, these low wind turbines boost performance and will ensure that each project is optimized to maximize generation.

MEM’s work on each of these projects demonstrates the advantages of enlisting an independent partner with experience and expertise in new and emerging markets to deliver investment-grade projects, instill investor confidence, and bring projects to financial close.

As part of its work on the three projects, MEM offered contract advisory services, served on project tenders, and provided project management services related to the financial close process. The Wayu project is expected to be complete by the end of 2016, while the Greenovation and Korat Wind projects are set to be commissioned by the end of 2017 and 2018, respectively.

“These projects illustrate how cutting-edge technology continues to be embraced in Thailand and the wider Asian market,” said James Munro, project manager at Modern Energy

Management. “Incorporating the latest low wind turbines ensures that these wind farms will be able to maximize energy generation even in low wind conditions. In turn, they will deliver long-term, steady returns to project investors.”

“Our success in completing the financing of these flagship projects shows that Thai wind is truly an investment-grade prospect,” said Janpon Ngamaroonchote, vice president of Strategic Planning and Investment at Gunkul Engineering. “Modern Energy Management’s understanding of the market in Thailand, along with its international experience helping to secure financing for early utility-scale developments has been a significant asset — and we look forward to continuing our work with the team throughout construction.”

Since 2013, MEM’s team has delivered specialist work in more than 20 countries and has been involved in Thai wind since the development of the first utility-scale wind projects. The firm helps to unlock significant financial and operational performance in emerging markets, and has a growing presence across Asia and Africa. ↵

*Source: Modern Energy Management*

For more information, go to [modernenergy.co.th](http://modernenergy.co.th)