

WINDS OF CHANGE

Offshore wind and ocean planning

By Chris Cortina, Catherine McCall, Chelsie Papiez and Gwynne Schultz

Imagine it is the year 2020 and Maryland's population has grown by 12.5 percent over the past decade to nearly 6.4 million people. The average Maryland power plant is now 40 years old. Where are new electricity sources and infrastructure going to come from to meet the demands of the growing population?

In 2006, Maryland set a Renewable Portfolio Standard requiring 20 percent of the State's electricity to be generated from renewable sources by 2022. Current land-based technologies would allow Maryland to meet just 36 percent of this goal. However, just off the Atlantic coast, the U.S. Department of Energy indicates Maryland has "outstanding" wind energy potential that rivals or exceeds Midwest land-based wind resources. Harnessing some of this wind energy using turbines could help fill Maryland's remaining renewable energy shortfall.

How turbines work

Wind turbines placed in the ocean minimize land use and view-shed impacts while maximizing efficient energy generation. Offshore wind turbines can be fixed or floating. Strong steady offshore winds move the turbines, generating electricity.

Typically constructed in a grid pattern, offshore turbines are connected to the onshore electricity grid by underwater cables. Electricity produced from offshore wind would feed into the onshore energy grid that serves Maryland businesses and residents.

Researchers from the University of Delaware analyzed hypothetical power output from five-megawatt offshore turbines similar to the one shown here off the coast of Belgium →



Hans Hillevaert

Off of Maryland's coast, wind turbines would be located in waters less than 100 feet deep in high wind areas close to the onshore electric grid, while avoiding shipping lanes and natural resources. Offshore wind developers and transmission companies are interested in distances that are 8 to 15 nautical miles from shore.

The Maryland Department of Natural Resources (DNR) will be involved in the environmental review of the various phases of wind facility siting and construction, transmission line siting and possible long-term impact studies.

Offshore planning

In Europe, more than 828 offshore wind turbines are currently being used to generate more than 2,000 megawatts of power, enough to power 800,000 homes. Here, the future development of offshore wind facilities in the ocean will add to what is already an increasingly busy place. We mine sand for our beaches, ship goods along the coast and fish commercially and recreationally.

Cold water corals, dolphins, fish, horseshoe crabs, whales, and water birds call the ocean and its sea floor home. New and increasing numbers of ocean uses – such as offshore wind energy – are challenging us to think about our ocean space in a more innovative and collaborative way.

To ensure the protection of Maryland's critical ocean resources and the coastal economies that depend on them, DNR has begun an ocean mapping and planning effort.

This Marine Spatial Planning (MSP) process examines human activities in the ocean over space and time to help determine how best to achieve ecological, economic and social objectives. The process is helping Maryland evaluate where offshore wind energy may be most compatible with existing uses and natural resources.

The Coastal Atlas

The first step in the planning process was to gather ocean resource and human use data through collaborative efforts with the Nature Conservancy and the Maryland

Energy Administration. Then, working with Towson University Center for GIS, Maryland launched the online, interactive Coastal Atlas mapping tool that provides access to this data for stakeholders, decision-makers and the public.

Maryland is using the data collected and displayed in the Coastal Atlas, along with stakeholder feedback, to identify sites that may be most suitable for offshore wind energy development.

DNR has engaged citizens in the process through Coastal Atlas previews, in-person and virtual open houses, interviews, presentations to DNR advisory groups and mapping meetings.

A great diversity of interests and uses of the ocean were represented by attendees including: recreational and commercial fishermen; business/industry representatives (including offshore wind developers); elected officials; non-profit organizations; academics and students; federal, state and local government representatives; and concerned citizens.

The most common concerns expressed by the stakeholders included visual impacts of offshore wind turbines and impacts to fisheries and other natural resources.

Where are we headed?

Maryland is at the beginning of a multi-year process to facilitate the deployment of offshore wind energy off our Atlantic Coast. In April, DNR representatives joined other State and Federal agencies for the first meeting of the Department of Interior's Bureau of Ocean Energy Management's (BOEM) Offshore Wind Task Force. This process provides Maryland an opportunity to make recommendations about preferred sites for offshore wind.

From finding the best location for renewable energy projects to locating sand resources needed for beach replenishment to helping local communities identify areas vulnerable to sea level rise and erosion – the Coastal Atlas assists users in identifying potential conflicts so that they can then be avoided early in the planning process.



Not alone in its efforts to map, plan and influence the decisions made regarding the uses and resources that lie off of our Atlantic Coast, Maryland is joining other states in the Mid-Atlantic engaged in similar efforts to evaluate offshore wind energy projects. Moving forward, Maryland will work with New York, New Jersey, Delaware and Virginia through the Mid-Atlantic Regional Council on the Ocean to develop common siting protocols and to address research and data gaps.

Using the tools and techniques that DNR has already developed, Maryland is positioned to be proactive in its ocean planning efforts – to engage stakeholders, to represent the interests of those who use the ocean resources, and to evaluate and improve the data and tools informing the State's recommendations. ■

Feedback received from the spring meetings are used to guide and inform Maryland actions about wind energy planning.

Access to the online Virtual Open House and public comment database is available at www.dnr.maryland.gov/ccp/coastal_resources/oceanplanning

Stakeholders are invited to submit comments and questions throughout this process to oceanplanning@dnr.state.md.us. Visit the Maryland Coastal Atlas at www.dnr.maryland.gov/ccp/coastalatlus

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