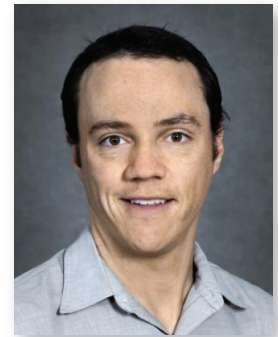


Estimating the Value of Offshore Wind Along the United States' Eastern Coast

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With Guest Lecturer Dr. Andrew Mills

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Abstract

Offshore wind power development in the United States is challenged, in part, by an unclear understanding of the value that offshore wind provides within an overall electricity portfolio. We develop a rigorous method to estimate the value provided by offshore wind projects, focusing on economic but also including environmental impacts. Seasonal and diurnal profiles of wind resources vary by location, including whether plants are onshore or offshore. These location-specific profiles impact the value of wind in terms of the types of other generation it displaces, its contribution to meeting peak demand, its ability to reduce emissions, and the local price of electricity and renewable energy credit (RECs). We estimate value using real historical weather patterns at thousands of potential offshore wind sites and wholesale and REC market outcomes. In effect, the work asks: What would have been the economic value of offshore wind projects along the East Coast over the 2007 to 2016 timeframe? We then also highlight factors that might drive these values up or down in the future for potential offshore wind projects. Knowing the primary drivers for the value of offshore wind, and how that value varies geographically and over time, an analyst can support wind developers and policymakers, and may help inform DOE on its offshore wind technology cost targets as well as the early-stage R&D investments necessary to reach them. This lecture expands on this research to provide more context on how the characteristics of wind energy affect its economic value in wholesale markets, along with recent trends in wind technology cost and performance.

Biography

Dr. Andrew Mills is a Research Scientist in the Electricity Markets and Policy Group at Lawrence Berkeley National Laboratory. He conducts research on the integration of variable generation into the electric power system, evaluating the costs, benefits, and institutional needs of renewable energy transmission and other supporting infrastructure. Previously, Dr. Mills worked with All Cell Technologies, a battery technology start-up company.

He has published his research in IEEE Transactions on Sustainable Energy, IEEE Journal of Photovoltaics, Wind Energy, and Energy Policy among other journals. He was a contributing author to the IPCC Contribution of Working Group III to the Fifth Assessment Report and Special Report on Renewable Energy Sources and Climate Change Mitigation.

Dr. Mills earned his Ph.D. in Energy and Resources from UC Berkeley, and his B.S. in Mechanical Engineering from the Illinois Institute of Technology.

