Technology Innovation

The Outlook for Wind Technology Innovation: What Do the World's Foremost Experts Foresee?

On-Demand Content

Solo-Presenter(s)

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Presentation Description: Wind energy costs have declined rapidly in recent years—far faster than many previously anticipated. In 2015, we conducted a global expert elicitation survey that demonstrated that substantial cost reductions were likely, for both onshore and offshore wind. Here, five years later, we report on an updated survey of 140 global wind experts, again seeking insight into the possible magnitude of future cost reductions and the uncertainties and drivers of those reductions. Importantly, we will report perspectives on how these cost trajectories might be reached in terms of capital and operating costs, energy output, design life, and cost of financing. We will summarize expert views on turbine size and site conditions for onshore and offshore wind, as well as tradeoffs between fixed-bottom and floating foundations for offshore installations. And, we will highlight expert perspectives on approaches to increase the grid-system value of wind, including through hybridization. The last five years has been a period of extraordinary cost reduction. Further scientific, engineering, manufacturing and commercial innovations are possible. Now is an opportune time to take stock of the state of industry, and assess opportunities for additional technology evolution and cost declines, which will influence wind's future role in electricity supply and the ease of energy-sector decarbonisation.

Learning Objectives:

- Demonstrate that, despite the steep reductions in onshore and offshore wind costs in recent years, there remain tremendous opportunities for significant continued cost declines. Importantly, these LCOE reductions are expected to be driven by multiple advancements, leading to lower CapEx and OpEx, higher energy output, and extended project lifetimes.
- Describe the importance of turbine scaling and related innovations in driving costs lower. Global wind experts anticipate strong growth in turbine size, albeit with a number of factors ultimately constraining continued increases in nameplate rating, hub heights, and rotor diameters.

- List the factors likely to influence wind turbine and plant design beyond the levelized cost of energy. The value of wind energy to the power grid is becoming increasingly important, and will increasingly motivate design and operational choices—whether hybridization with storage or PV, provision of grid-services beyond energy, or self-curtailment to extend design lives. We will report how global experts view these options, and which are likely to become more prevalent.