The World’s Leading Experts Opine on Future Wind Energy Costs and Cost Drivers


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About the Survey

This poster presents the results of an expert elicitation survey of 163 of the world’s foremost wind energy experts, aimed at better understanding future wind energy costs and technology advancement possibilities.

The survey, which may be the largest single elicitation ever performed on an energy technology in terms of expert participation, was conducted as part of IEA Wind Task 26 on the Cost of Wind Energy and led by Ryan Wiser from Lawrence Berkeley Laboratory.

Survey participants

A total of 163 responses came from a broad cross-section of the wind sector.

Respondents were able to identify multiple wind applications, geographies, and types of expertise.

The median respondent dedicated 49 minutes to completing the survey, with the 25th-to-75th percentile range from 29 to 99 minutes.

Median Turbine Stats in 2030

Experts predict greater scaling in rotor swept area than in turbine capacity leading to a reduction in specific power, at least globally, also yielding higher capacity factors.

For fixed-bottom offshore wind expected turbine capacity ratings and hub heights grow significantly in order to minimize CapEx, but specific power is expected to remain roughly at recent levels.

Main Results - Significant LCOE Reduction expected

Expert survey results show an expectation of continued reductions in the levelized cost of wind energy (LCOE). Across all three wind applications, the LCOE is anticipated to decline by 24%–30% in 2030 and by 35%–41% in 2050, relative to 2014 baseline values in the “best guess” scenario, focusing on the median value of expert responses.

Equipment manufacturers sometimes expect less LCOE reduction, especially in near term for fixed-bottom offshore; respondents who only expressed knowledge of offshore wind (not also onshore) tend to be more aggressive on LCOE reduction

Main drivers of Cost Reduction

The largest cost reduction drivers are CapEx and capacity factors improvements for onshore wind and CapEx and financing cost improvements for fixed-bottom offshore while reductions in floating are expected to be driven by higher capacity factors.

The median-scenario LCOE forecast has an implicit learning rate of 14%–18% which is consistent with longterm single factor learning rates from other research studies.

Further Reading

The full report on the expert survey and complementary material including a webinar is available online:

https://emp.lbl.gov/publications/forecasting-wind-energy-costs-and

Onshore wind is expected to remain less expensive than offshore—and fixed-bottom offshore less expensive than floating.

However, there are greater absolute reductions and more uncertainty in the LCOE of offshore wind compared with onshore wind, and a narrowing gap between fixed-bottom and floating offshore, with especially sizable anticipated reductions in the LCOE of floating offshore wind between 2020 and 2030.

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