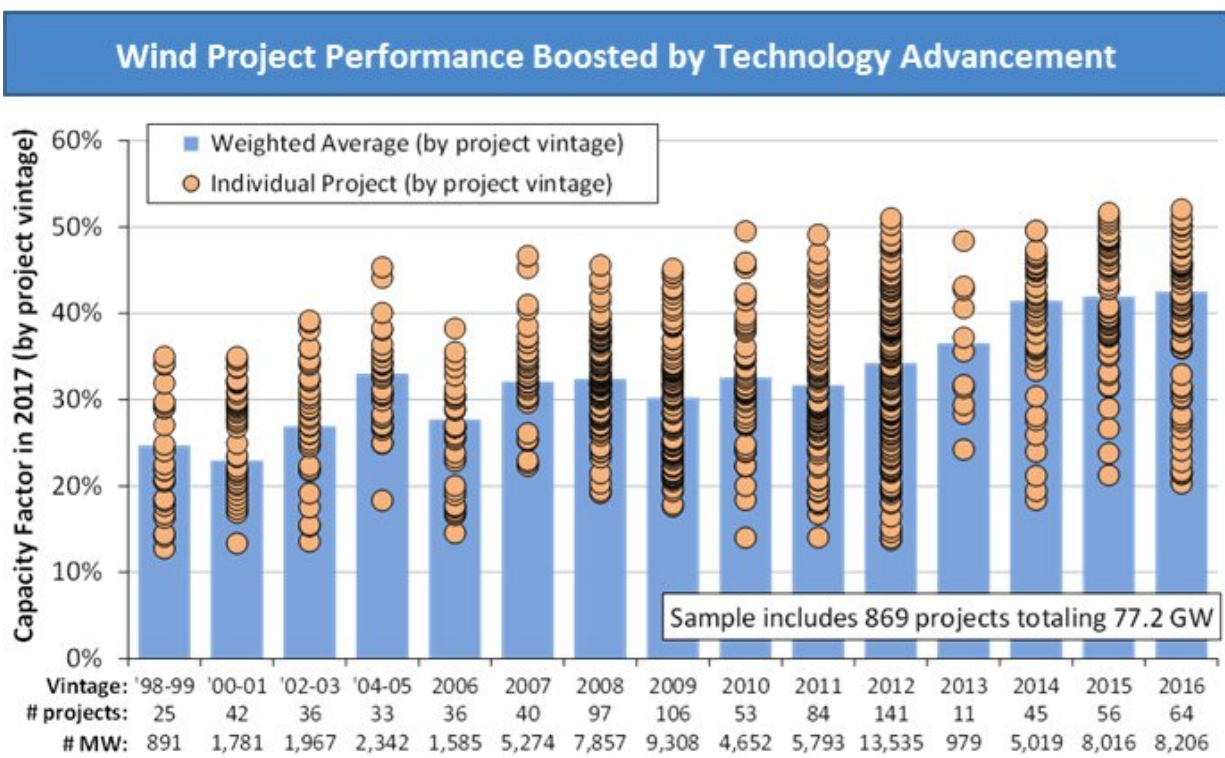


Report confirms wind technology advancements continue to drive down wind energy prices

August 23 2018, by Julie Chao



Wind Project Performance Boosted by Technology Advancement. Credit: Berkeley Lab

Wind energy pricing remains attractive, according to an annual report released by the U.S. Department of Energy and prepared by Lawrence

Berkeley National Laboratory (Berkeley Lab). At an average of around 2 cents per kilowatt-hour (kWh), prices offered by newly built wind projects in the United States are being driven lower by technology advancements and cost reductions.

"Wind [energy](#) prices—particularly in the central United States, and supported by federal tax incentives—remain at all-time lows, with utilities and corporate buyers selecting wind as a low-cost option," said Berkeley Lab Senior Scientist Ryan Wiser of the [Electricity Markets & Policy Group](#).

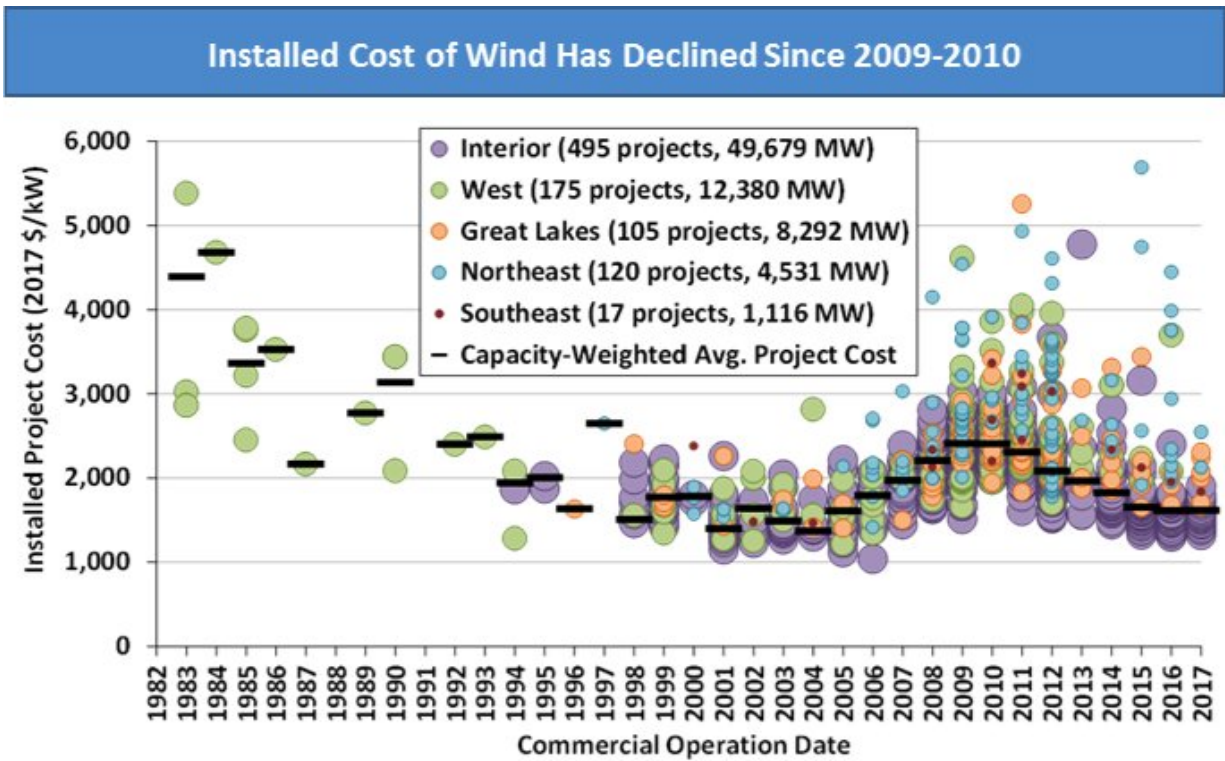
Key findings from the U.S. Department of Energy's "[Wind Technologies Market Report](#)" include:

- Wind power capacity additions continued at a rapid pace in 2017. Nationwide, [wind power capacity](#) additions equaled 7,017 megawatts (MW) in 2017, with \$11 billion invested in new plants. Wind power constituted 25 percent of all U.S. generation capacity additions in 2017. Wind energy contributed 6.3 percent of the nation's electricity supply, more than 10 percent of total electricity generation in 14 states, and more than 30 percent in four of those [states](#) (Iowa, Kansas, Oklahoma, and South Dakota).
- Bigger turbines are enhancing wind project performance. The average generating capacity of newly installed wind turbines in the United States in 2017 was 2.32 MW, up 8 percent from the previous year and 224 percent since 1998-1999. The average rotor diameter in 2017 was 113 meters, a 4 percent increase over the previous year and a 135 percent boost over 1998-1999, while the average hub height in 2017 was 86 meters, up 4 percent from the previous year and 54 percent since 1998-1999. Permit applications to the Federal Aviation Administration suggest that still-taller turbines are on the way. Increased rotor diameters, in

particular, have begun to dramatically increase wind project capacity factors. The average 2017 capacity factor among projects built from 2014 through 2016 was 42 percent, compared to an average of 31.5 percent among projects built from 2004 to 2011, and 23.5 percent among projects built from 1998 to 2001.

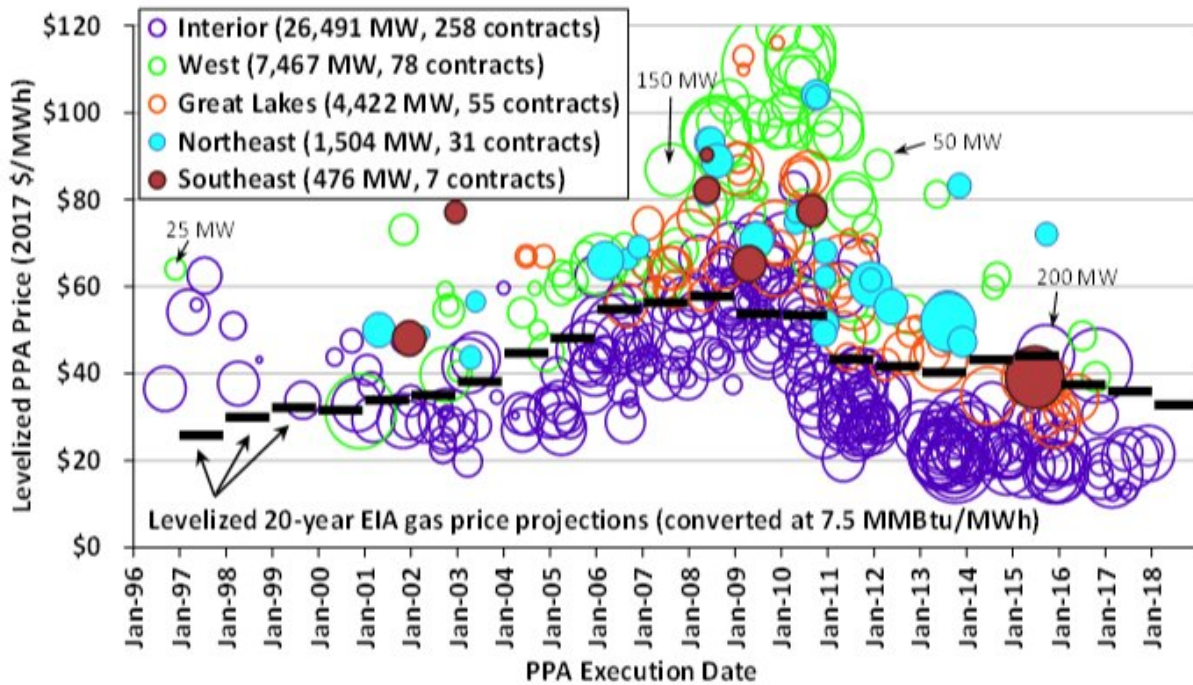
- Low wind turbine pricing continues to push down installed project costs. Wind turbine equipment prices have fallen to \$750-\$950/kilowatt (kW), and these declines are pushing down project-level costs. The average installed cost of wind projects in 2017 was \$1,610/kW, down \$795/kW from the peak in 2009 and 2010.
- Wind energy prices remain low. Lower installed [project](#) costs, along with improvements in [capacity](#) factors, are enabling aggressive wind power pricing. After topping out at 7 cents per kWh in 2009, the average levelized long-term price from [wind power](#) sales agreements has dropped to around 2 cents per kWh—though this nationwide average is dominated by projects that hail from the lowest-priced region, in the central United States. Recently signed [wind energy](#) contracts compare favorably to projections of the fuel costs of gas-fired generation. These low prices have spurred demand for wind energy from both traditional electric utilities and nonutility purchasers, such as corporations, universities, and municipalities.
- The domestic supply chain for [wind](#) equipment is diverse. Wind sector employment reached a new high of 105,500 full-time workers at the end of 2017. For [wind projects](#) recently installed in the United States, domestically manufactured content is highest for nacelle assembly (more than 90 percent), towers (70 to 90 percent), and blades and hubs (50 to 70 percent). It is much lower (less than 20 percent) for most components internal to the turbine. Although there have been a number of manufacturing plant closures over the last decade, each of the three largest turbine suppliers serving the U.S. market—Vestas, General

Electric Co., and Siemens Gamesa—has one or more domestic manufacturing facilities in operation.



Installed Cost of Wind Has Declined Since 2009-2010 Credit: Berkeley Lab

Wind Prices Remain Low, Competitive with Cost of Operating Gas Plants



Wind Prices Remain Low, Competitive with Cost of Operating Gas Plants
 Credit: Berkeley Lab

Provided by Lawrence Berkeley National Laboratory

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