

New study finds price of wind energy in US at an all-time low; competitiveness of wind has improved

August 19 2014, by Allan Chen



Wind energy pricing is at an all-time low, according to a new report released by the U.S. Department of Energy and prepared by Lawrence Berkeley National Laboratory (Berkeley Lab). The prices offered by

wind projects to utility purchasers averaged just \$25/MWh for projects negotiating contracts in 2013, spurring demand for wind energy.

"Wind energy prices—particularly in the central United States— are at an all-time low, with utilities selecting wind as the low cost option," Berkeley Lab Staff Scientist Ryan Wiser said. "This is especially notable because, enabled by technology advancements, wind projects have increasingly been built in lower wind speed areas."

Key findings from the U.S. Department of Energy's latest "Wind Technologies Market Report" include:

- **Wind is a credible source of new generation in the United States.** Though wind power additions slowed in 2013, with just 1.1 gigawatts (GW) added, wind power has comprised 33% of all new U.S. electric capacity additions since 2007. Wind power currently contributes more than 4% of the nation's electricity supply, more than 12% of total electricity generation in nine states, and more than 25% in two states.
- **Turbine scaling is boosting wind project performance.** Since 1998-99, the average nameplate capacity of [wind turbines](#) installed in the United States has increased by 162% (to 1.87 MW in 2013), the average turbine hub height has increased by 45% (to 80 meters), and the average rotor diameter has increased by 103% (to 97 meters). This substantial scaling has enabled wind project developers to economically build projects in lower wind-speed sites, and is driving capacity factors higher for projects located in given wind resource regimes. Moreover, turbines originally designed for lower wind speeds are now regularly employed in higher wind speed sites, further boosting expected capacity factors.
- **Low wind turbine pricing continues to push down installed project costs.** Wind turbine prices have fallen 20 to 40% from

their highs back in 2008, and these declines are pushing project-level costs down. Based on the small sample of 2013 wind projects, installed costs averaged \$1,630/kW last year, down more than \$600/kW from the apparent peak in 2009 and 2010. Among a larger sample of projects currently under construction, average costs are \$1,750/kW.

- **Wind energy prices have reached all-time lows, improving the relative competitiveness of wind.** Lower wind turbine prices and installed project costs, along with improvements in expected capacity factors, are enabling aggressive wind power pricing. After topping out at nearly \$70/MWh in 2009, the average levelized long-term price from wind power sales agreements signed in 2013 fell to around \$25/MWh. This level is lower than the previous lows set back in the 2000-2005 period, which is notable given that wind projects have increasingly been sited in lower wind-speed areas. Wind energy prices are generally lowest in the central portion of the country. The continued decline in average wind prices, along with a bit of a rebound in wholesale power prices, put wind back at the bottom of the range of nationwide wholesale power prices in 2013. Wind energy contracts executed in 2013 also compare very favorably to a range of projections of the fuel costs of gas-fired generation extending out through 2040.
- **The manufacturing supply chain has experienced substantial growing pains in recent years, but a growing percentage of the equipment used in U.S. wind projects has been sourced domestically since 2006-2007.** The profitability of turbine suppliers rebounded in 2013, after a number of years in decline. Five of the 10 turbine suppliers with the largest share of the U.S. market have one or more manufacturing facilities in the United States. Nonetheless, more domestic wind manufacturing facilities closed in 2013 than opened. Additionally, the entire wind energy sector employed 50,500 full-

time workers in the United States at the end of 2013, a deep reduction from the 80,700 jobs reported for 2012. Despite these challenges, trade data show that a decreasing percentage of the equipment used in wind projects has been imported, when focusing on selected trade categories. When presented as a fraction of total equipment-related wind turbine costs, the combined import share of selected wind equipment tracked by trade codes (i.e., blades, towers, generators, gearboxes, and wind-powered generating sets) is estimated to have declined from nearly 80% in 2006–2007 to approximately 30% in 2012–2013; the overall import fraction is higher when considering equipment not tracked in [wind](#)-specific trade codes. Domestic content has increased and is high for blades, towers, and nacelle assembly; domestic content is considerably lower for much of the equipment internal to the nacelle.

- **Looking ahead, projections are for solid growth in 2014 and 2015, with uncertain prospects in 2016 and beyond.** The availability of federal incentives for [wind projects](#) that began construction at the end of 2013 has helped restart the domestic market, with significant new builds anticipated in 2014 and 2015. However, as noted by Mark Bolinger, Research Scientist at Berkeley Lab, "Projections for 2016 and beyond are much less certain. Despite the attractive price of [wind energy](#), federal policy uncertainty—in concert with continued low natural gas prices and modest electricity demand growth—may put a damper on medium-term market growth."

More information: The full report ("2013 Wind Technologies Market Report"), a presentation slide deck that summarizes the report, and an Excel workbook that contains much of the data presented in the report, can all be downloaded from: emp.lbl.gov/publications/2013-...logies-market-report

Provided by Lawrence Berkeley National Laboratory

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