

**BEFORE THE WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

In the Matter of the

Inquiry on Regulatory Treatment for
Renewable Energy Resources

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Docket No. UE-100849

**Exhibit B to Joint
Comments of Renewable
Northwest Project, NW Energy
Coalition, Climate Solutions,
Cascade Chapter of the Sierra
Club, and the Washington
Environmental Council**

Wind Cost and Performance Trends

Adam Schumaker, Intern—Renewable Northwest Project
July 13, 2010

Despite a significant decline in wind project installed costs since the 1980's, the cost of developing wind power has been increasing in recent years due to multiple factors (Figure 1). The capacity-weighted average installed cost of wind power increased by 11%, to \$1,915/kW, in 2008 from a capacity-weighted average cost of \$1,725/kW in 2007¹. Installed project costs continued to increase in 2009 despite a decreased demand for wind turbines resulting from the global economic turndown². This decreased demand has lowered turbine costs; with an expected 15% drop in turbine costs projected for the second half of 2010 compared to the second half of 2008³. However, due to the multi-year nature of wind power development, it will not be possible to observe the effects of lower turbine costs on overall installed project costs until 2011 or later. Although the cost of turbines has fallen recently, turbine costs have historically risen with demand and are affected by high material and energy prices during periods of strong economic growth⁴.

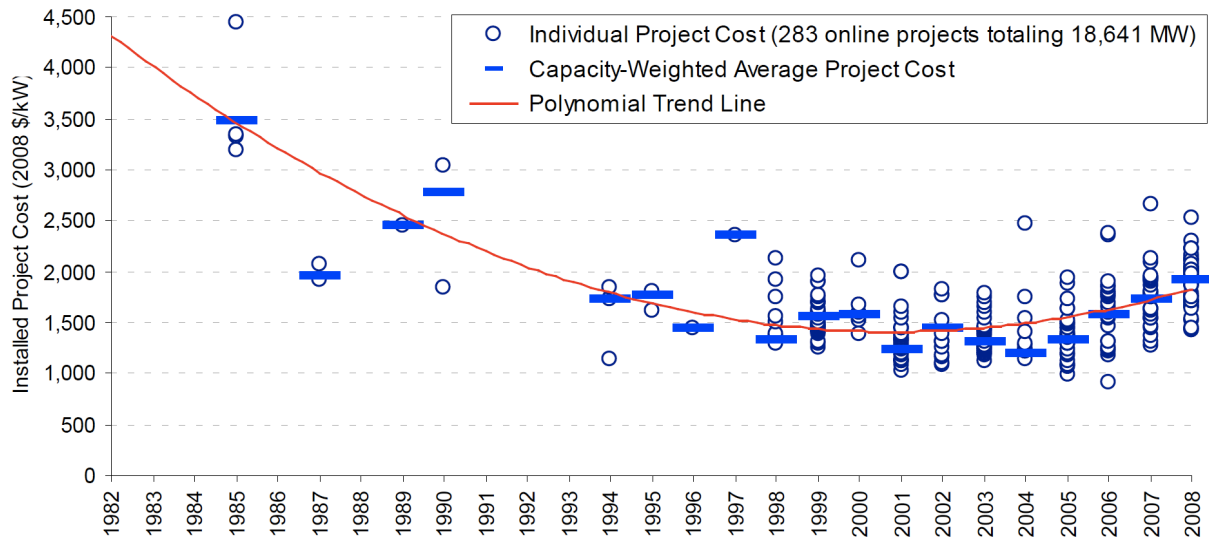


Figure 1. Installed Wind Project Costs Over Time. *2008 Wind Technologies Report*, p. 34.

Wind power technology has advanced considerably since the beginning of the utility scale wind industry; with average capacity factors increasing from 22% for projects installed prior to 1998, to 35-37% for projects installed between 2004-2007⁵. However, in recent years, the average capacity factor of installed projects appears to have reached a plateau. The average capacity factors for projects installed in 2006

¹ Wisner, Ryan and Bolinger, Mark. 2008 Wind Technologies Report. Lawrence Berkeley National Lab (LBNL). July, 2008. (p. 33)

² Wisner, Ryan. Personal Communication. July 13, 2010.

³ Ibid.

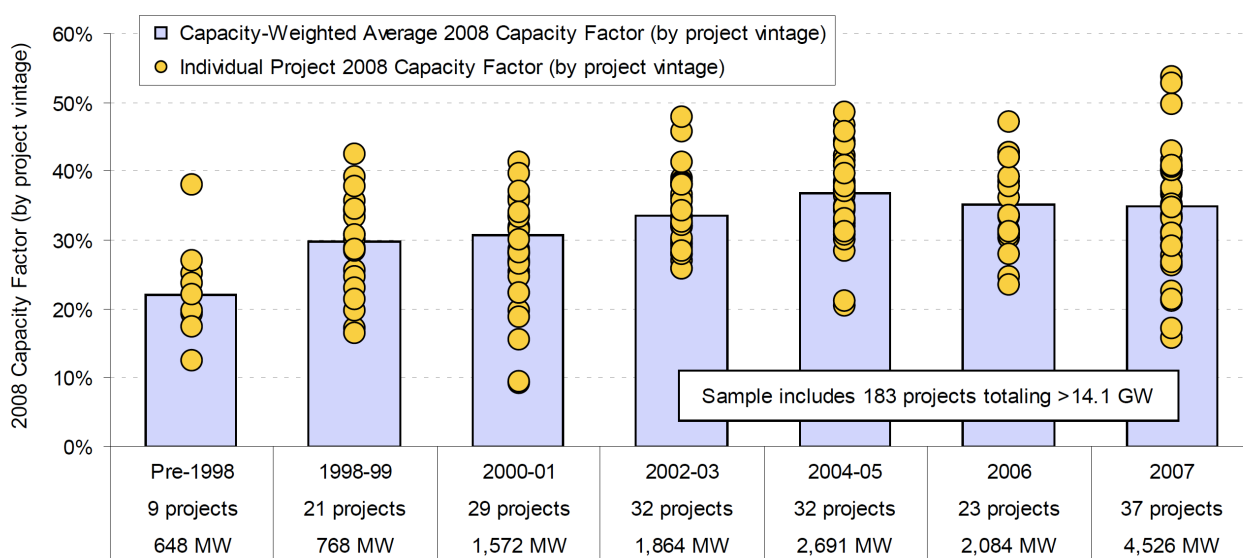
⁴ Wisner, Ryan and Bolinger, Mark. 2008 Wind Technologies Report. Lawrence Berkeley National Lab (LBNL). July, 2008. (p. 35)

⁵ Ibid.

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and 2007 have actually been lower than the average capacity factor for projects installed in 2005 (Figure 2). Projects included in the Lawrence Berkeley National Lab (LBNL) database, which accounts for 84% of the nationwide installed wind capacity at the end of 2007, demonstrated average capacity factors of 36.9%, 35.2%, and 35.0% for projects installed in 2004-2005, 2006, and 2007, respectively⁶. At the same time, the upper end of individual project capacity factors has increased, indicating improvement in wind power technology and/or siting. The overall decrease of average capacity factor in the presence of improved technology highlights significant confounding variables, such as wind turbine curtailment and transmission constraints, which have had an increasing negative effect on wind power production⁷.



Source: Berkeley Lab database

Figure 2. 2008 Project Capacity Factors by Commercial Operation Date. *2008 Wind Technologies Report*, p. 34.

When considering the future development of wind power projects, it is important to account for the trends listed above. The past few years have shown that the production of wind power projects will not necessarily improve with the availability of improved technology. Also, the general trend for installed wind project costs has been increasing in recent years and is affected significantly by demand. These trends, coupled with a current low cost for wind turbines, suggest that near term investment in wind power will be more economically advantageous than postponed investment. With an economic recovery and possible climate legislation on the horizon, demand for land, transmission, and turbines could likely reinstitute the trend of climbing costs for wind power development.

⁶ Wisner, Ryan and Bolinger, Mark. 2008 Wind Technologies Report. Lawrence Berkeley National Lab (LBNL). July, 2008. (p. 37)

⁷ Ibid.