

A large wind turbine silhouette is the central focus, set against a vibrant sunset sky. The sky transitions from a deep orange near the horizon to a dark blue at the top. A thin crescent moon is visible in the upper left quadrant. The turbine's tower and nacelle are dark, with a small red light visible on the nacelle. The blades are spread out, and power lines are visible in the background.

2010 WIND TECHNOLOGIES MARKET REPORT

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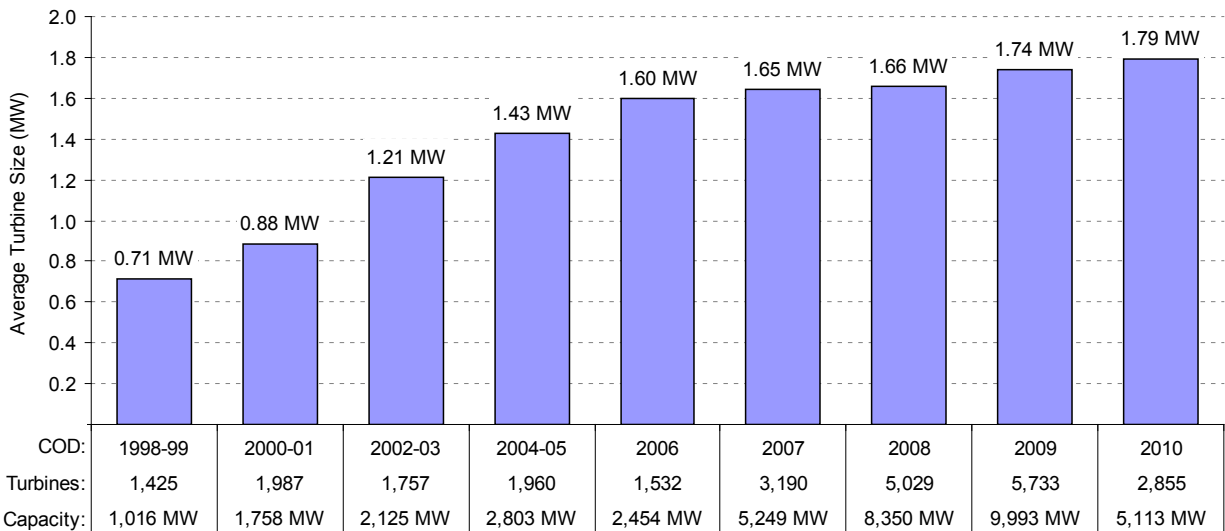
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The Average Nameplate Capacity, Hub Height, and Rotor Diameter of Installed Wind Turbines Increased

The average nameplate capacity of wind turbines installed in the United States in 2010 increased to roughly 1.79 MW (Figure 16), up from 1.74 MW in 2009 and 1.66 MW in 2008.³² Since 1998-99, average turbine nameplate capacity has increased by 151%, but growth in this metric has slowed in recent years due to the dominance of GE's 1.5 MW turbine and as a result of the logistical challenges associated with transporting larger turbines to project sites.³³



Source: AWEA project database

Figure 16. Average Turbine Nameplate Capacity Installed During Period

Table 5 shows how the distribution of turbine nameplate capacity has shifted over time: nearly 27% of all turbines installed in 2010 had a nameplate capacity larger than 2.0 MW, compared to almost 25% in 2009, 19% in 2008, 16% in both 2007 and 2006, and just 0.1% or less in years prior to 2006. GE's 1.5/1.6 MW wind turbine remained by far the nation's most-popular turbine in 2010, with 1,679 units installed (1,432 of the 1.5 MW version, and 247 of the 1.6 MW version), equating to 50% of all wind power capacity installed in 2010.³⁴

³² Modest differences exist between these figures and those presented by AWEA (2011a) for the reasons discussed in footnote 2.

³³ Figure 16 (as well as a number of the other figures and tables included in this report) combines data into both one- or two-year periods in order to avoid distortions related to small sample size in the PTC lapse years of 2000, 2002, and 2004; though not a PTC lapse year, 1998 is grouped with 1999 due to the small sample of 1998 projects.

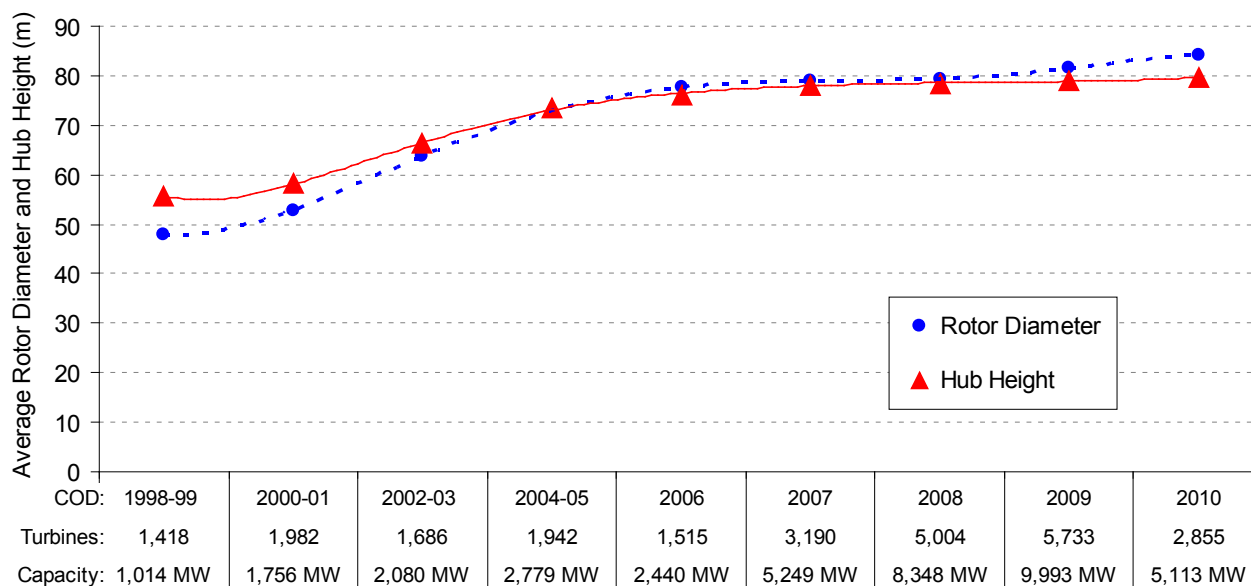
³⁴ A number of *existing* GE 1.5 MW turbines installed in earlier years were also upgraded to 1.6 MW in 2010, but data on how many or which turbines were upgraded are not publicly available, and so this change in nameplate capacity is not reflected in the data presented in this report.

Table 5. Size Distribution of Number of Turbines over Time

Years:	1998-99	2000-01	2002-03	2004-05	2006	2007	2008	2009	2010	
# MW:	1,016	1,758	2,125	2,803	2,454	5,249	8,350	9,993	5,113	
# turbines:	1,425	1,987	1,757	1,960	1,536	3,190	5,029	5,733	2,855	
Turbine Size Range (MW)	<0.5	1.3%	0.4%	0.5%	1.8%	0.7%	0.0%	0.5%	0.2%	0.1%
	0.51-1.0	98.5%	73.9%	43.4%	18.5%	10.7%	11.2%	10.3%	4.6%	0.2%
	1.01-1.5	0.0%	25.4%	43.5%	56.0%	54.0%	49.2%	53.5%	49.4%	52.8%
	1.51-2.0	0.3%	0.4%	12.5%	23.6%	18.4%	23.1%	16.3%	21.1%	20.2%
	2.01-2.5	0.0%	0.0%	0.0%	0.1%	16.2%	15.2%	16.8%	23.2%	24.1%
2.51-3.0	0.0%	0.0%	0.1%	0.0%	0.0%	1.3%	2.5%	1.4%	2.5%	

Source: AWEA project database

In addition to nameplate capacity ratings, average hub heights and rotor diameters have also scaled with time. The average hub height of wind turbines installed in the United States in 2010 was 79.8 meters (Figure 17), up from 78.9 meters for projects installed in 2009 and 78.5 meters for projects installed in 2008. Since 1998-99, the average turbine hub height has increased by 43% (or 24.1 meters), though year-on-year growth has slowed in the more recent years. Average rotor diameters have increased at a more rapid pace: the average rotor diameter of wind turbines installed in the United States in 2010 was 84.3 meters (Figure 17), up from 81.6 meters in 2009 and 79.3 meters in 2008. Since 1998-99, the average rotor diameter has increased by 76% (or 36.4 meters). Although the vast majority of turbines installed in 2010 (99.2% of total capacity) and all of the turbines installed in 2009 had hub heights no greater than 80 meters, 17 turbines installed in 2010 (totaling 38.5 MW) had hub heights of 100 meters. With respect to rotor diameters, less than 6% of the new wind capacity installed in 2009 involved turbines with diameters of at least 95 meters, and only one turbine (equaling 0.02% of newly installed capacity) was 100 meters or larger (101 meters). In 2010, however, those percentages grew substantially, with 18% of new capacity involving rotor diameters of at least 95 meters and 10% of new capacity at 100 meters or larger.



Source: Berkeley Lab

Figure 17. Average Rotor Diameter and Hub Height Installed During Period