



National Renewable Energy Laboratory
 Innovation for Our Energy Future

**Estimates of Windy¹ Land Area and Wind
 Energy Potential by State for Areas >= 30%
 Capacity Factor at 80m**

February 4, 2010



These estimates show, for each of the 48 contiguous states and the entire United States, the windy land area with a gross capacity factor (without losses) of 30% and greater at 80-m height above ground and the wind energy potential from development of the “available” windy land area after exclusions. The “Installed Capacity” shows the potential megawatts (MW) of rated capacity that could be installed on the available windy land area, and the “Annual Generation” shows annual wind energy generation in gigawatt-hours (GWh) that could be produced from the installed capacity. AWS Truewind, LLC developed the wind resource data for windNavigator® (<http://navigator.awstruewind.com>) with a spatial resolution of 200 m. NREL produced the estimates of windy land area and windy energy potential, including filtering the estimates to exclude areas unlikely to be developed such as wilderness areas, parks, urban areas, and water features (see Wind Resource Exclusion Table for more detail).

State	Windy Land Area >= 30% Gross Capacity Factor at 80m					Wind Energy Potential	
	Total (km ²)	Excluded ² (km ²)	Available (km ²)	Available % of State	% of Total Windy Land Excluded	Installed Capacity ³ (MW)	Annual Generation (GWh)
Alabama	80.4	56.7	23.6	0.02%	70.6%	118.2	333
Arizona	4,545.0	2,364.1	2,180.8	0.74%	52.0%	10,904.1	30,616
Arkansas	4,663.2	2,823.2	1,840.1	1.34%	60.5%	9,200.3	26,906
California	26,901.3	20,079.2	6,822.0	1.67%	74.6%	34,110.2	105,646
Colorado	95,830.4	18,386.5	77,443.9	28.73%	19.2%	387,219.5	1,288,490
Connecticut	31.4	26.1	5.3	0.04%	83.1%	26.5	73
Delaware	36.6	34.7	1.9	0.04%	94.8%	9.5	26
Florida	9.6	9.5	0.1	0.00%	99.2%	0.4	1
Georgia	281.3	255.3	26.0	0.02%	90.7%	130.1	380
Idaho	13,420.4	9,805.3	3,615.1	1.67%	73.1%	18,075.6	52,118
Illinois	70,763.6	20,787.1	49,976.4	34.25%	29.4%	249,882.1	763,529
Indiana	46,255.2	16,609.7	29,645.5	31.63%	35.9%	148,227.5	443,912
Iowa	134,900.1	20,757.3	114,142.8	78.32%	15.4%	570,714.2	2,026,340
Kansas	211,861.3	21,387.1	190,474.2	89.38%	10.1%	952,370.9	3,646,590
Kentucky	48.7	36.6	12.1	0.01%	75.1%	60.6	173
Louisiana	125.5	43.6	82.0	0.07%	34.7%	409.8	1,100
Maine	6,026.5	3,776.2	2,250.2	2.69%	62.7%	11,251.2	33,779
Maryland	567.7	271.1	296.6	1.18%	47.8%	1,482.9	4,269



National Renewable Energy Laboratory
Innovation for Our Energy Future

**Estimates of Windy¹ Land Area and Wind
Energy Potential by State for Areas >= 30%
Capacity Factor at 80m**

February 4, 2010



These estimates show, for each of the 48 contiguous states and the entire United States, the windy land area with a gross capacity factor (without losses) of 30% and greater at 80-m height above ground and the wind energy potential from development of the “available” windy land area after exclusions. The “Installed Capacity” shows the potential megawatts (MW) of rated capacity that could be installed on the available windy land area, and the “Annual Generation” shows annual wind energy generation in gigawatt-hours (GWh) that could be produced from the installed capacity. AWS Truewind, LLC developed the wind resource data for windNavigator® (<http://navigator.awstruewind.com>) with a spatial resolution of 200 m. NREL produced the estimates of windy land area and windy energy potential, including filtering the estimates to exclude areas unlikely to be developed such as wilderness areas, parks, urban areas, and water features (see Wind Resource Exclusion Table for more detail).

State	Windy Land Area >= 30% Gross Capacity Factor at 80m					Wind Energy Potential	
	Total (km ²)	Excluded ² (km ²)	Available (km ²)	Available % of State	% of Total Windy Land Excluded	Installed Capacity ³ (MW)	Annual Generation (GWh)
Massachusetts	1,709.0	1,503.4	205.6	0.99%	88.0%	1,028.0	3,323
Michigan	19,761.3	7,952.9	11,808.5	7.85%	40.2%	59,042.3	169,221
Minnesota	121,884.7	24,030.6	97,854.1	44.83%	19.7%	489,270.6	1,679,480
Mississippi	0.0	0.0	0.0	0.00%	N/A	0.0	0
Missouri	69,676.8	14,805.8	54,871.0	30.39%	21.2%	274,355.1	810,619
Montana	232,768.6	43,967.7	188,800.9	49.60%	18.9%	944,004.4	3,228,620
Nebraska	199,627.8	16,028.0	183,599.7	91.64%	8.0%	917,998.7	3,540,370
Nevada	5,873.6	4,424.2	1,449.4	0.51%	75.3%	7,247.1	20,823
New Hampshire	1,663.8	1,236.8	427.1	1.78%	74.3%	2,135.4	6,706
New Jersey	280.8	254.5	26.4	0.14%	90.6%	131.8	373
New Mexico	111,445.8	13,029.1	98,416.7	31.25%	11.7%	492,083.3	1,644,970
New York	17,705.8	12,549.6	5,156.3	4.10%	70.9%	25,781.3	74,695
North Carolina	1,155.6	994.1	161.5	0.13%	86.0%	807.7	2,395
North Dakota	182,374.6	28,335.4	154,039.2	84.25%	15.5%	770,195.8	2,983,750
Ohio	17,189.9	6,205.9	10,983.9	10.28%	36.1%	54,919.7	151,881
Oklahoma	123,243.6	19,879.2	103,364.4	57.10%	16.1%	516,822.1	1,788,910
Oregon	17,109.8	11,689.7	5,420.1	2.16%	68.3%	27,100.3	80,855
Pennsylvania	2,123.5	1,462.1	661.4	0.56%	68.9%	3,307.2	9,673



National Renewable Energy Laboratory
Innovation for Our Energy Future

**Estimates of Windy¹ Land Area and Wind
Energy Potential by State for Areas >= 30%
Capacity Factor at 80m**

February 4, 2010



These estimates show, for each of the 48 contiguous states and the entire United States, the windy land area with a gross capacity factor (without losses) of 30% and greater at 80-m height above ground and the wind energy potential from development of the “available” windy land area after exclusions. The “Installed Capacity” shows the potential megawatts (MW) of rated capacity that could be installed on the available windy land area, and the “Annual Generation” shows annual wind energy generation in gigawatt-hours (GWh) that could be produced from the installed capacity. AWS Truewind, LLC developed the wind resource data for windNavigator® (<http://navigator.awstruewind.com>) with a spatial resolution of 200 m. NREL produced the estimates of windy land area and windy energy potential, including filtering the estimates to exclude areas unlikely to be developed such as wilderness areas, parks, urban areas, and water features (see Wind Resource Exclusion Table for more detail).

State	Windy Land Area >= 30% Gross Capacity Factor at 80m					Wind Energy Potential	
	Total (km ²)	Excluded ² (km ²)	Available (km ²)	Available % of State	% of Total Windy Land Excluded	Installed Capacity ³ (MW)	Annual Generation (GWh)
Rhode Island	74.0	64.7	9.3	0.35%	87.4%	46.6	153
South Carolina	102.8	65.8	37.0	0.05%	64.0%	185.0	504
South Dakota	193,828.3	17,345.8	176,482.5	88.36%	8.9%	882,412.4	3,411,690
Tennessee	359.9	298.1	61.9	0.06%	82.8%	309.3	900
Texas	435,638.6	55,332.7	380,305.9	55.54%	12.7%	1,901,529.7	6,527,850
Utah	5,273.6	2,652.8	2,620.7	1.19%	50.3%	13,103.7	37,104
Vermont	2,569.6	1,979.8	589.7	2.39%	77.0%	2,948.7	9,163
Virginia	1,567.2	1,208.5	358.7	0.35%	77.1%	1,793.3	5,395
Washington	11,932.6	8,236.9	3,695.7	2.12%	69.0%	18,478.5	55,550
West Virginia	1,495.2	1,118.6	376.6	0.60%	74.8%	1,883.2	5,820
Wisconsin	30,228.8	9,477.3	20,751.4	14.29%	31.4%	103,757.1	300,136
Wyoming	146,166.2	35,751.7	110,414.5	43.58%	24.5%	552,072.6	1,944,340
US 48 Total	2,571,180	479,391	2,091,789	26.89%	18.6%	10,458,945	36,919,551

¹ NREL’s wind potential estimates were based on maps produced by AWS Truewind using the MesoMap® system.

² Excluded lands include protected lands (national parks, wilderness, etc.), incompatible land use (urban, airports, wetland, and water features), and other considerations. See Table 1 for full listing.

³ Assumes 5 MW/km² of installed nameplate capacity