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Wind Power

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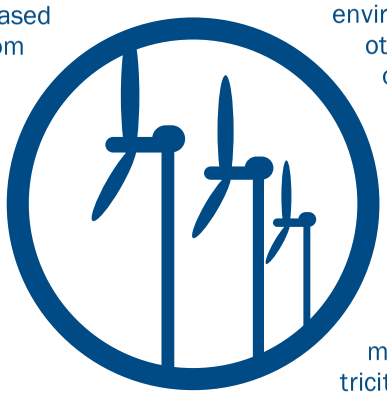
Wind Power in Massachusetts

Wind resources can be used with both large wind turbines for utility applications and with small wind turbines for on-site generation. As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from class 1 (the lowest) to class 7 (the highest). In general, wind power class 3 or higher can be useful for generating wind power with large (utility-scale) turbines, and small turbines can be used at any wind speed. Class 4 and above are considered good resources.



WIND POWER CLASS	50m (164 ft) WIND POWER* W/m^2	SPEED m/s †	SPEED mph
	0	0	0
1	200	5.6	12.5
2	300	6.4	14.3
3	400	7.0	15.7
4	500	7.5	16.8
5	600	8.0	17.9
6	800	8.8	19.7
7	2000	11.9	26.6

RIDGE CREST ESTIMATES (LOCAL RELIEF > 1000 FT)
* Wind Power Density - watts per square meter
† meters per second

According to analysis conducted by the US Department of Energy, Massachusetts has excellent wind resources in parts of the state. Areas of highest wind energy potential (class 5 and 6) are the outer coastal areas such as Cape Cod and Nantucket Island. The primary areas of good onshore wind energy resources (class 3 and 4) are the exposed hilltops, ridge crests, and mountain summits in the western part of the state.

Onshore Potential

Though siting decisions regarding individual wind facilities are up to state and local officials, DOE has estimated that approximately 16% of the land area in Massachusetts may be suitable for wind power development. Where did these estimates come from? First, they excluded the land which has a wind power class of 2 or less-the nonusable resources. Then, they excluded land with urban development or land that is environmentally sensitive. Assuming there may be other land-use conflicts as well, they subtracted out 50% of forest land, 30% of farmland, and 10% of rangeland, resulting in about 16% of the state of Massachusetts having good winds and being available for development.

According to these estimates, if all of the onshore wind energy potential was developed with utility-scale wind turbines, the power produced each year could equal 33,000,000 megawatt-hours - or 70% of the entire state's electricity consumption. The American Wind Energy Association has estimated the potential to be 28,000,000 megawatt hours.

Coastal and Offshore Potential

As mentioned above, the highest wind potential areas for Massachusetts are the outer coastal areas such as Cape Cod and Nantucket Island, and their offshore areas. Offshore potential tends to be higher due to a lack of local roughness features such as vegetation and buildings which can reduce the wind power potential at some land based sites. The US DOE has had monitoring stations set up along the Northeast coast at Nantucket Island and Provincetown, Massachusetts; Montauk Point, New York; and Block Island, Rhode Island. The areas around outer Cape Cod and Nantucket Island have been found to have class 6 wind resources. *(see back for current state of wind power in New England)*

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Current and Proposed Wind Projects in New England

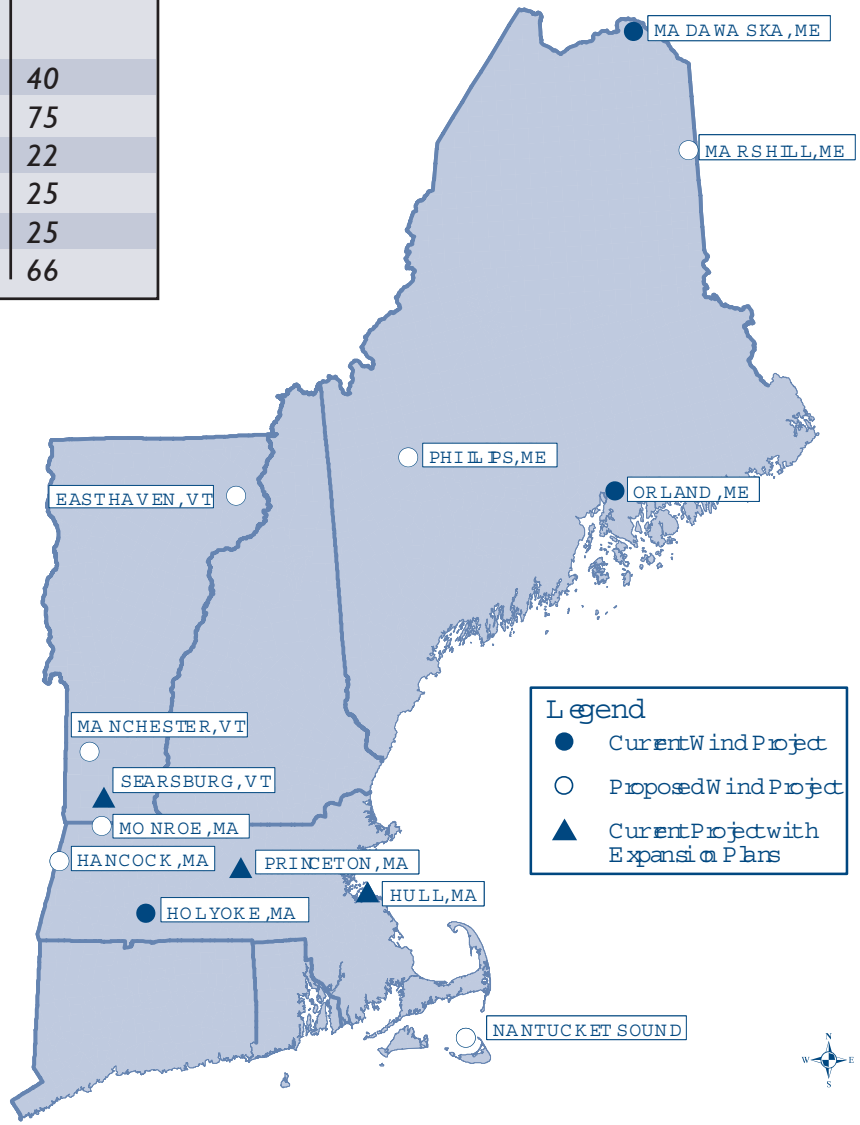
Existing Wind Projects

Location	Size (in Megawatts)	Number of towers	Facility Area (acres)	Height of tower (feet)	Length of Rotor (feet)
Holyoke, MA	0.25	1	< 1	80	40
Hull, MA	0.66	1	< 1	164	75
Princeton, MA	0.32	8	16	100	22
Madawaska, ME	0.05	1	< 1	100	25
Orland, ME	0.05	1	< 1	100	25
Searsburg, VT	6.0	11	35	131	66

Proposed Expansion of Existing Wind Projects

Location	Added Capacity (in Megawatts)
Hull, MA	1.5-5.0
Princeton, MA	3
Searsburg, VT	30-40

Proposed Wind Projects

Location	Size (in Megawatts)
Hancock, MA	13.5
Monroe, MA	28.8
Nantucket Sound, MA	420
Mars Hill, ME	40-50
Phillips, ME	52
Manchester, VT	9
East Haven, VT	6

Current and Proposed Wind Projects in New England