

Town of Duxbury
Alternative Energy Committee

Community Scale Wind Facilities Bylaw
Overview



“A Bridge to a Cleaner Future”

Why Wind?

- **Saves the Town money-** *The Alternative Energy Committee is proposing this by-law as one method to fulfill our primary mission of “Saving the Town money on energy cost”.*
- **Reduces our carbon footprint-** *This bylaw is an approach to both reduce the town’s energy costs as well as carbon footprint by enabling the construction of a community scale wind turbine on publicly owned land. The facility will supply clean, inexpensive power to municipal departments within the Town. (Schools, Town Hall, Pool, Library, Golf Course, Police and Fire Stations etc).*

Wind Facility Economics

- Development Costs - \$1,500,000
- Annual Clean Energy Credits - \$69,000
- Annual Energy Savings - \$237,000
- Annual Operating Costs – (\$40,000)
- Payback – 6.3 years

Sample Wind Turbine Economics

Development Costs

\$1,500,000

		Annual*	Savings or Credit	
Annual Savings		Savings or Credit (kW-hrs)	(per kW-hr)	
Energy Savings		1,156,320	\$0.180	\$208,000
Renewable Energy Credits		1,156,320	\$0.045	\$52,000
Renewable Energy Production Incentive		1,156,320	\$0.015	\$17,000
Annual Operating Costs				
Insurance				-\$18,000
Maintenance				-\$22,000
Net Annual Benefit				\$237,000
Annual Return on Cost				16%
Simple Payback Period (years)				6.33

Notes * Based on energy savings of a 660 kW turbine with a 20% capacity factor.

8760 hrs/ yr x 660 kW x 20% = 1,156,320 kW-hr/year

Proforma excludes possible design & construction grant funding

Clean Green Energy

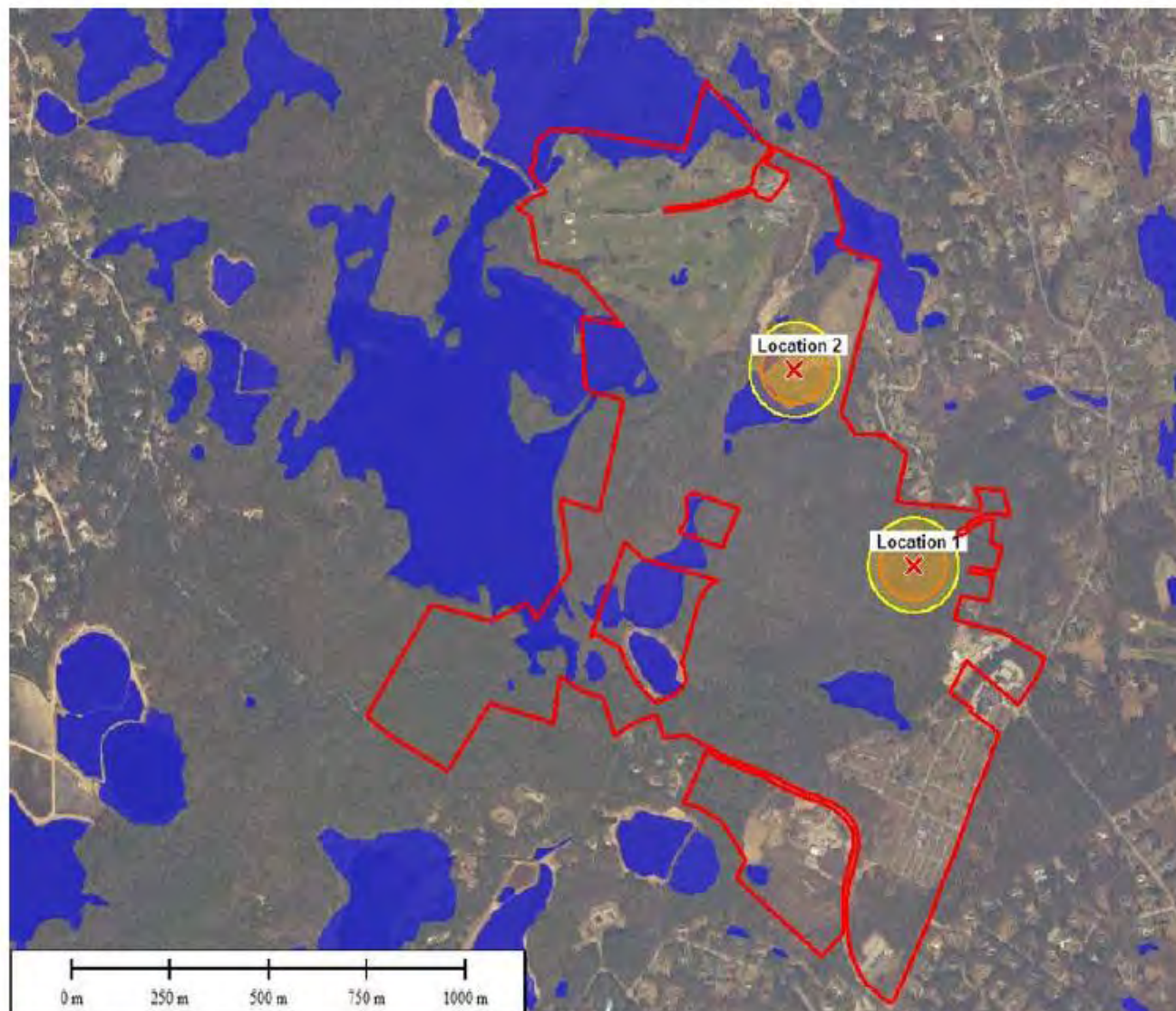
- A 660 kW wind turbine will displace 1,300 tons of carbon dioxide per year
- Over 20 years, to produce same power would require burning 17,000 tons of coal
- A line of 10 ton trucks 7 miles long

Bylaw Highlights

- Community Scale Wind Facilities – To generate power for use at municipally owned facilities
- Location limited to publicly owned land overlay, exclusive of dunes protection and wetlands protection districts
- No higher than 250 feet
- **Not “As of Right”**. Any project would require a special permit from the ZBA

Site Assessment Survey

- AEC successfully applied to Mass Renewable Energy Trust for a grant to conduct a site survey
- The survey studied 6 sites in Duxbury for community scale wind facility development potential
- Concluded that site between DPW and North Hill Golf Course was desirable location
- This determination entitles Duxbury to apply for a grant for the next study phase, a comprehensive feasibility study

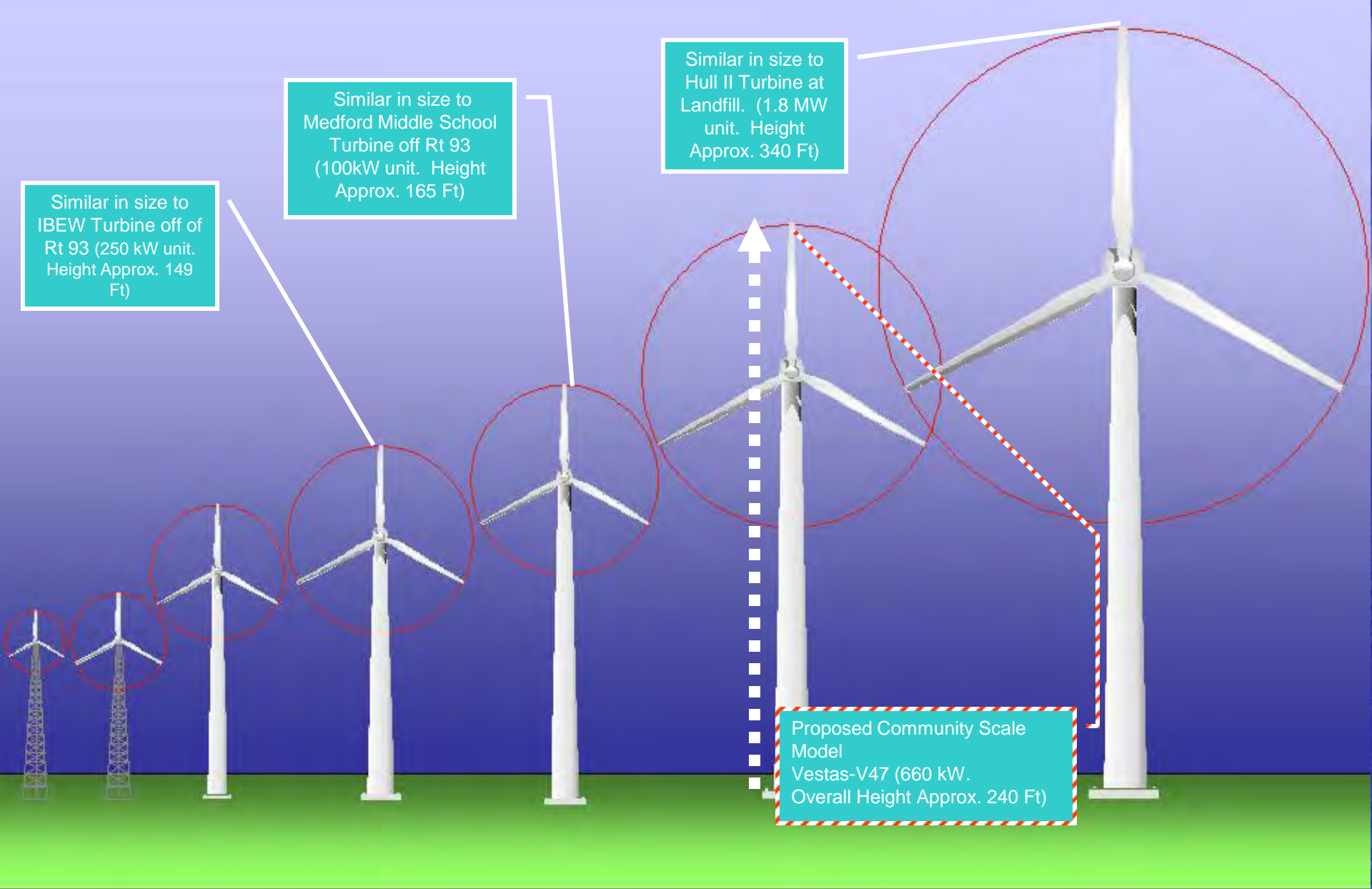


-  National Wetlands Inventory
-  76-m MTH x 1.1 Property Boundary Setback
-  76-m MTH x 1.5 Safety Setback from Site Use Areas and Facilities
-  Potential Turbine Location
-  Site Boundaries

Projection: Massachusetts Mainland State Plane, Meters, NAD83
Data Layer Source: Office of Geographic and Environmental Information (MassGIS)



Figure 18. Site 3 – Potential Turbine Locations



RELATIVE SCALE OF LOCAL AREA WIND TURBINES

(Vestas V47- 660kW)

(Vestas V80- 1.8MW)

Next Steps : 2-3 year process

- Comprehensive feasibility analysis including 12 month meteorological tower study
- Grant application for Design & Construction funding
- Pre-development design and engineering
- Application to ZBA for special permit
- Structure development financing
- Construction of wind turbine