

# Communities See Green in the Wind

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**O**n a quiet day in the summer of 2004, a group drove out to a field in Bourne, Massachusetts to erect a pole. This unassuming structure was the result of an effort by community leaders, a state agency, and wind experts to explore the development of a municipally owned and operated wind turbine in the town. The pole, a meteorological tower that measures local wind conditions, will help the community document the wind power available at the site and determine whether constructing a wind turbine makes economic sense.

For the past year and a half, cities and towns across Massachusetts have been working with the Massachusetts Technology Collaborative (MTC) to explore the potential for installing wind turbines on municipal land. This joint effort, the Community Wind Collaborative, aims to increase the number of renewable energy generating projects in the state while simultaneously increasing public acceptance of wind energy. The program is taking a unique approach to testing the hypothesis that small pockets of one or two turbines per community will a) be easier to site and, b) receive more public support than large wind farms.

## How Does the Community Wind Collaborative Work?

Established by MTC and funded through the Renewable Energy Trust, the Community Wind Collaborative provides information, guidance, and site-specific technical services to help municipalities make an educated decision about whether developing a wind energy project makes sense on their land. The careful process of community deliberation and investigation has already proven to be an effective way to educate the public



**A meteorological tower goes up in Falmouth, MA. This tower was erected in April 2004 and is currently collecting wind data for the site.**

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about viable renewable energy options.

The collaborative offers a structured, eight-phase process that systematically takes a community through the various phases of wind energy development. This process is flexible to allow for each community's unique needs.

Once a community decides to go on to the next phase, MTC in many cases provides and pays for technical services appropriate to the next phase (the community needs to provide some case-specific in-kind support, such as an elec-

trical hook-up for a wind monitoring tower). Assuming that a community proceeds through the various phases, the consultants that provide the technical services will develop a feasibility study and business plan for the community. The city or town can then understand the expected economic benefits of a wind turbine and can choose an appropriate model for owning the turbine. Should a community decide to proceed to construction, MTC may provide financial incentives or other financial assistance.

## The Eight Phases of a Community Wind Project

1. Project Conceptions and Potential Site Selection
2. Wind Measurements and Monitoring
3. Planning and Development Study and Feasibility Analysis
4. Community Review and Ownership Decision
5. Project Pre-Construction
6. Project Marketing and Financing
7. Procurement and Installation
8. Management, Operation and Maintenance

To help communities decide whether it is worthwhile to participate in the Community Wind Collaborative, MTC created a wind atlas based on computer models of wind speeds. Communities use these maps to target good wind sites that coincide with municipal land. MTC has contracted with the University of Massachusetts' Renewable Energy Research Lab to construct wind-monitoring towers and to analyze the resulting data. It is expected that by spring 2005, nine communities will have reached this phase of the process. The community decides whether it wants to actually construct a turbine or turbines, and determines whether it will own it itself, work with a private developer, or use a hybrid ownership structure.

### How Do Communities Build Local Support?

The idea of exploring municipal wind often arises from interested citizens. Many communities form committees to explore renewable energy development, recycling, green buildings, and other aspects of sustainable development. These committees typically work in tandem with a town's board of selectmen or a city's elected officials. They are given a mandate to explore wind energy development for municipal use. These partnerships are critical in establishing local support for wind.

Even after getting involved with the Community Wind Collaborative, these committees play the leading role in building local support. They hold public meet-



**An NRG data logger is installed at the meteorological tower in Falmouth, MA. Data from the tower is collected through the logger and aggregated once a month by a community representative.**

ings to educate fellow citizens and determine the level of interest. MTC requires that this sort of community education be part of the process, but encourages the committee to decide what form that education should take. When requested, MTC staff and outreach consultants can also provide information, materials, and presentations.

### Why Focus on Municipal Land?

In creating this program, MTC asked many community representatives about wind turbine siting and community support and concluded that wind turbines with the potential for local ownership and/or benefit would be better received in a community than those driven strictly by private development. This approach has several added benefits. First, many communities have expressed interest in distributed generation applications where the energy could be used on-site at a municipal facility. Such on-site use often

improves the overall financial profile for a project. Second, in areas where this is not possible, many communities feel that public stewardship of these structures on municipal land has a real benefit to taxpayers. Third, using municipal land for a municipal project avoids lease payments to a landowner.

The financial side of a community-scale wind project is crucial. Even the most committed environmentalists and renewable energy advocates want their communities to secure a meaningful financial return from developing a wind turbine. Therefore, the Community Wind Collaborative has a strong focus on proving the economic viability of individual turbines within a town.

### How Long Does it Take to Build a Turbine?

Exploration to installation normally takes at least two years. Once a community has determined a viable site for exploration,

a meteorological tower is constructed to measure the wind for 12 months. While the wind data is being collected, other parts of a planning and development study can be conducted to determine the feasibility of a wind energy generation system. Once a feasibility study is complete and a financial analysis has been conducted, the community is at a point to make a decision as to how it would like to move forward. After a community decides to build a turbine, it can take a little over a year for studies, financing, procurement, and construction to occur. No community in our Community Wind Collaborative has reached this point in the process yet, but it is expected that in 2005 several will decide to construct turbines. The extensive exploration process is essential to determining the viability of wind power at specific municipal locations.

### What Are the Economics of a Community Wind Project?

Given construction costs and the amount of wind available in most parts of New England, it is currently difficult for wind projects of one or two turbines to be financially successful. In general, installing more than one turbine at a site increases the opportunity for an acceptable financial return, as does use of the power on-site. A strong wind resource (at least 14.5 mph) is also critical to projects of any size, ownership structure, or financing arrangement. Even if favorable conditions like good wind and low construction costs are present, financial support from MTC beyond initial feasibility costs may be necessary to make some projects practical.

MTC has committed funds for the Community Wind Collaborative because this program has so many potential bene-

fits. MTC was the first agency in the country to develop a program that targets municipal development of wind projects of one or a few turbines. The MTC Board has so far authorized \$4 million for the Community Wind Collaborative. Although MTC is only able to fund municipalities within Massachusetts that are served by multi-community investor-owned utilities, it is expected that other states and regions will watch this model in action and be able to draw different components from it.

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