Considerations for Municipalities Considering Wind Projects

Why Wind?

Municipalities can garner numerous environmental and economic benefits from developing wind energy projects. Producing electricity with wind power is less environmentally degrading and consumptive of natural resources than burning fossil fuels. Often compatible with existing land uses, wind facilities do not directly emit greenhouse gases, and according to the National Renewable Energy Laboratory (2009), 1 megawatt (MW) of wind power capacity can offset emissions from 460 passenger vehicles and yield nearly 1.3 million gallons of annual water savings.

Wind energy projects can also reduce costs for communities and provide other economic benefits. Electricity generated from wind can displace grid-based electricity and provide a buffer against volatility in fossil fuel prices. In addition, wind energy projects can create local jobs, supplement municipal tax revenues, and enhance local and regional energy independence.

Some Things to Consider

Although wind energy projects can yield many benefits, investing in wind power is a big decision and municipalities have a number of considerations to bear in mind - starting with whether or not a wind turbine is the right type of energy project for the community.

1. ***Public engagement and siting***. The processes involved in local, state, and federal review for potential wind projects are important considerations for host communities. Ideally, community-based discussions about siting should begin *before* potential wind projects are formally proposed. To ensure that community members are informed of progress of proposed wind projects from start to finish, municipalities should involve a diverse array of stakeholder groups early on and commit to a transparent process for addressing any and all questions raised. Generally, the earlier and more robust a municipality's public education and engagement process is, the better the chances for adoption of policies and protocols necessary for a successful and responsibly sited and operated wind project.

A 2010 survey of local officials by the American Planning Association provides additional insight on public engagement and siting for wind projects. It indicates that having a good local ordinance for wind energy is important to the success of wind projects, even if this means writing a new set of regulations. The survey also finds that the wind siting process should engage and inform local stakeholders, such as by providing accurate, meaningful information about the operation of turbines and demonstrating the economic benefits of wind energy. Providing fact sheets and online postings, and inviting wind energy developers to give community presentations may help with the dissemination of information. DOER recommends that municipalities adopt local wind energy bylaws to address issues such as flicker and sound, and to identify appropriate wind energy sites. DOER has developed two model bylaws for

communities' use. Local development and adoption of a bylaw is a good starting place for the local outreach and communication process around wind power.

2. ***Flicker***. Shadow flicker is the fluctuation in sunlight intensity caused by the rotation of turbine blades. Although studies have not shown that shadow flicker is harmful to human health, some people have reported headaches or dizziness, and some report that they simply find flicker annoying. Massachusetts state government has not set limits on allowable flicker, but several states and municipalities have adopted a limit of 30 hours per year on residences or occupied buildings (New England Wind Energy Education Project 2011). The extent to which a wind turbine causes flicker depends on seasonal and weather conditions, geographic features, and the characteristics of the turbine. Project planners can predict the location and timing of shadow flicker for potential projects using software and can mitigate flicker through siting or operational curtailments. Municipalities can also work to mitigate the issue using plantings and other strategies.

3. ***Sound***. The sound produced by wind turbines may be another area of concern for host communities. The movement of rotating turbine blades generates sound. Generally, the Massachusetts Department of Environmental Protection (MassDEP) noise policy limits noise level increases from sources to 10 decibels (dB) over ambient sound levels. Local bylaws may also regulate noise from wind energy facilities. Atmospheric conditions, background noise, topography, and the position of the listener influence turbine sound and perception of that sound. Project planners can minimize wind turbine sound and its impacts through consideration of potential turbine locations and use of quieter technologies.

4. ***Economics***. Municipalities will want to consider economic costs and benefits when looking to develop wind energy projects, taking into account expenses associated with permitting, designing, building, and maintaining a project, while recognizing that generation equipment is often a large capital expense. Municipalities should consider the risks and uncertainties associated with operating a wind project, including fluctuating electricity prices, variability of electricity production, and potential maintenance costs. On the other hand, municipalities can garner economic benefits from selling power and Renewable Energy Certificates, offsetting municipal energy use, and increasing employment within the community. Strength of wind resources and cost of land may have important implications for a project's economic viability.

Additional Information/Assistance

As municipalities and other public entities seeking to develop wind capacity continue to gather information on this endeavor, they should be careful to ensure that the information is reliable and applicable to their particular situations. The Commonwealth, through DOER, MassDEP, and the Massachusetts Clean Energy Center, can help clarify points of confusion and provide helpful resources. A more complete guide on making informed decisions related to land-based wind energy is available online.