

Renewable Energy Fact Sheet: What You Should Know About Installing On-site Renewable Energy for Your Massachusetts Business

An increasing number of businesses in the Commonwealth are taking an interest in renewable energy. Reasons include wanting to cut energy costs, reduce dependence on fossil fuels, minimize greenhouse gas emissions, stay competitive, and be a responsible neighbor within their community. The Office of Technical Assistance and Technology (OTA) is committed to helping businesses achieve these goals. This fact sheet addresses some of the most common questions regarding renewable energy systems in Massachusetts.

State Financial Incentives

The Renewable Energy Trust (RET), which is currently housed in the Massachusetts Clean Energy Center (CEC), provides funding for renewable energy projects in Massachusetts through the following programs:

- Commonwealth Solar II ¹ provides rebates for commercial solar photovoltaic (PV) projects up to 10 kilowatts (kW) in capacity. The Host Customer (and project site) must be a customer of an investor-owned electric distribution utility that pays into the Renewable Energy Trust.
- Commonwealth Wind ² provides rebate, grant, and loan funding for wind energy projects of all sizes. Funding is available for residential, commercial, industrial, and public facilities that are customers of investor-owned electric distribution utilities or Municipal Light Plant Departments that pay into the Renewable Energy Trust. There are three initiatives in the program:



Photo Courtesy MassEnergy

Fresh Hair Solar Hot Water



Photo Courtesy Jiminy Peak

Jiminy Peak Wind Turbine

- o Micro Wind Initiative - provides rebates for the installation of wind projects - located at residential, commercial, industrial, institutional, and public facilities - with capacity <100 kW. Eligible systems are supported through a hybrid incentive structure consisting of installation and production rebates.
- o Community-Scale Wind Initiative - awards grants for qualifying wind projects with a nameplate capacity ≥ 100 kW. MassCEC provides financial and technical support through a competitive feasibility and design & construction grant award process. Public entities may apply for a free site assessment.
- o Commercial Wind Initiative - assists commercial wind development projects (land-based projects that are >2 MW and cannot be net metered) by providing funding for feasibility studies and development activities.
- Commonwealth Hydropower ³ - provides grant funding for the upgrade of existing hydropower facilities to increase their energy output, and the development of new “conduit”-type facilities. Facilities must meet, or be working to meet, the requirements for qualification for the Massachusetts Renewable Portfolio Standard. MassCEC anticipates issuing another solicitation for this program in the second half of 2010.

Sponsors of biomass projects are encouraged to contact Amy Barad of MassCEC (617-315-9355) to discuss funding options until a program for this technology is developed. There are also a number of state tax incentives ⁴ available from Massachusetts that are not limited to projects producing electricity. Finally, incentives for solar thermal projects are available as a “custom” measure through the natural gas energy efficiency programs offered by the following natural gas companies – Bay State Gas, Berkshire Gas, National Grid, New England Gas Company, NSTAR, and Fitchburg Gas and Electric (Unitil). Information on these incentives is accessed through the Mass Save ⁵ program.

Implementation of Renewable Energy Systems

- ◆ Implementing energy efficiency measures should **always** precede any renewable energy project.
 - Energy efficiency is often a prerequisite for renewable energy funding, can result in energy savings comparable to renewable energy, and often has a payback of 2 years or less.
 - Most renewable energy projects will have at least a 4-5 year payback after funding incentives.
- ◆ For businesses not wanting to incur capital costs, a number of renewable energy system integrators offer third party ownership and operation of equipment through a power purchase agreement (PPA).
 - With a PPA, integrators install, own and operate the system, and the host facility purchases the power generated through a contract with the integrator.
- ◆ Renewable energy systems that generate electricity require approval from your utility to connect a distributed generation project to their distribution system. ⁶
 - Being connected to the grid assures that your facility will receive power when the renewable energy system is not operating.

Federal Financial Incentives

Tax incentives ⁷, grants, and loans are also available from the federal government for renewable energy projects. A combination of tax credits and accelerated depreciation can fund significant portions of some types of renewables projects (such as solar) and are a common source of funding. The American Recovery and Reinvestment Act of 2009 allows taxpayers eligible for the Business Investment Tax Credit to receive a grant from the U.S. Treasury Department ⁸ instead of taking the Business ITC for new installations. In addition, companies meeting the definition of a small, rural business are eligible for grants and guaranteed loans from the USDA ⁹ for most types of renewable energy projects. All federal funding is subject to periodic reappropriations or expiration; therefore, future funding could be expanded or possibly reduced or eliminated.

Other Financial Considerations

In addition to providing energy and reducing expenses for electricity or fuel, a renewable energy system can be a source of revenue in the form of renewable energy certificates (RECs) and net metering –

Renewable energy certificates (RECs) - represent the positive environmental attributes associated with the generation of clean renewable energy. One REC is created for every 1 MWh (or 1000 kWh) of electricity generated by a renewable energy system. Renewable energy generators typically sell their RECs by entering into contracts with a buyer, or by selling them to aggregators who in turn resell them.

To promote the installation of small (≤ 2 MW) on-site solar PV systems, the Massachusetts Department of Energy Resources (DOER) has created the Solar Carve-Out program ¹⁰. It is a market-based incentive program to create a smooth transition from upfront, rebate-only incentives (such as the Commonwealth Solar program) to production-based, market-priced RECs.

Net Metering ¹¹ – when an eligible on-site renewable energy system generates more electricity than the host facility uses, the electric meter runs backward and the facility's account gets net metering credits for net excess generation at the end of their monthly billing period. There are several categories of net metering facilities in Massachusetts. "Class I" facilities are defined as systems up to 60 kW in capacity. "Class II" facilities are generally defined as systems greater than 60 kW and up to one megawatt (MW) in capacity that generate electricity from agricultural products, solar energy or wind energy. "Class III" facilities are generally defined as systems greater than 1 MW and up to 2 MW in capacity that generate electricity from agricultural products, solar energy or wind energy. All net-metered facilities must be behind a customer's meter, and customers need to comply with their utility's net metering requirements.



Bixby Intl. Corp. Solar (PV)

Photo Courtesy of Bixby Intl. Corp.

The keys to successful renewable energy projects are top-level management commitment and appropriately selecting a renewable energy technology based on your area's natural resources and your business's demand for energy. The following provides points to consider when evaluating the use of renewable technologies in Massachusetts.

Wind ¹²

Where sufficient wind resources exist ^{13 14} wind turbines can have among the best payback of any renewable energy source and have the potential to produce very large amounts of electricity. Ideal locations have average wind speeds of at least 6.5 m/s (14.5 mph), 24/7 operations, and are not in close proximity to an airport. There should also be enough land area so that the turbine is a sufficient distance from buildings, property lines, and residences. Note that environmental protection issues ¹⁵ and local zoning bylaws ¹⁶ can impact the viability of a wind turbine project.

“Jiminy Peak’s wind turbine helps our company stay ahead of our competition by providing safe, stable, and consistent renewable energy”.
- Jim Van Dyke, Jiminy Peak, 1.5 MW wind

“Alternative energy solutions offer valuable economic and environmental benefits to small and large companies alike.”
- Dean Cycon, Dean’s Beans Organic Coffee Co., 10 kW solar (PV)

Solar ¹⁷

Solar energy can be used to produce electricity, heat, or hot water. As solar energy is a relatively diffuse resource, these systems have the potential to take up a considerable amount of space. For example, on average, about 100 square feet of panels are required for each kW of power generated, resulting in 3-5 lb per square foot of additional live roof load. Ideal sites for solar projects have high energy use (or charges) around mid-day, particularly in summer. They also have large amounts of low-cost, structurally sound, obstruction-free space that will allow panels to receive direct sunlight between 9am and 4pm with little to no shading. Usually this is a flat or south-facing rooftop that will not need replacement soon or that will be replaced in conjunction with the solar installation. Tools are available to estimate the energy production and cost savings of solar photovoltaic systems ¹⁸.

Biomass ¹⁹

Biomass (e.g., wood) and biofuels (liquid fuels derived from agricultural products) can be good energy sources for businesses with significant heating needs. Businesses that already produce biobased waste streams can most directly benefit, though these fuels are also readily procured throughout the Commonwealth. Biobased projects require significant space for equipment and fuel storage. Biomass and biofuels projects can incorporate combined heat and power, often improving system economics and environmental benefits.



View of Wood-Fired Boiler at Seaman Paper

Photo Courtesy of Seaman Paper

Small Hydroelectric

Businesses that own an existing dam at their facility may benefit from on-site hydroelectric generation. Dam owners are already required to properly maintain dams. Therefore, adding, refurbishing, or upgrading a hydroelectric system in conjunction with dam repair can be cost effective. Actual energy production is based on the dam water flow rate (which can be seasonal), and height, but a few hundred kilowatts is typical. Not all hydropower projects are associated with dams; some are located in non-ecological systems, e.g., in conduits, or within wastewater treatment systems. Installing on-site hydroelectric generation requires licensing from the Federal Energy Regulatory Commission (FERC), which can be a lengthy process unless FERC’s advice for expediting the process ²⁰ is followed.



Riverdale Mills Hydropower

Photo Courtesy Riverdale Mills

References

1. <http://www.commonwealthsolar.org/>
2. <http://masscec.com/index.cfm?pid=11044>
3. http://www.masstech.org/Grants_and_Awards/comm_hydro_09/hydro_09.html
4. <http://tinyurl.com/DOER-State-tax-incentives>
5. <http://www.masssave.com/business/new-construction-and-equipment/find-incentives/>
6. <http://sites.google.com/site/massdgc/Home>
7. <http://www.dsireusa.org/incentives/index.cfm?state=us&re=1&EE=0>
8. <http://www.treas.gov/recovery/1603.shtml>
9. <http://www.rurdev.usda.gov/rbs/farmland>
10. <http://tinyurl.com/DOER-solar-carve-out-site>
11. <http://sites.google.com/site/massdgc/Home/net-metering-in-ma>
12. <http://tinyurl.com/DOER-wind-site>
13. <http://maps.massgis.state.ma.us/wind/>
14. <http://tinyurl.com/DOER-locating-wind-sites>
15. http://maps.massgis.state.ma.us/wind/wind_guidelines.htm
16. <http://tinyurl.com/DOER-zoning-bylaws>
17. <http://tinyurl.com/DOER-solar-site>
18. <http://www.nrel.gov/redc/pvwatts/>
19. <http://tinyurl.com/DOER-biomass-site>
20. <http://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact.asp>

The Office of Technical Assistance and Technology (OTA) provides a range of non-regulatory assistance services to help businesses cut costs, improve chemical use efficiency, and reduce environmental impact in Massachusetts. For further information about renewable energy or about OTA's technical assistance services, contact:

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