

# CLEAN ENERGY RESULTS

Quarterly Report to the  
Massachusetts Department of Energy Resources  
Covering January 1 - March 31, 2012



Solar Construction at Canton Landfill (6.7mw)

April 2012

Massachusetts Department of Environmental Protection

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## BACKGROUND

The Clean Energy Results Program, established in July 2011 and launched in November 2011, is a first-of-its-kind partnership between the Massachusetts Department of Environmental Protection (MassDEP) and the Massachusetts Department of Energy Resources (DOER). This innovative new program builds on MassDEP's unique regulatory expertise and authority to support DOER in advancing the permitting and development of renewable energy and energy efficiency projects throughout Massachusetts.

Accomplishments this quarter include achieving and exceeding the program's goal of increasing renewable energy generation at participating Energy Leader drinking water and wastewater utilities by 50% (actual increase was 76%, 26% above goal and eight months ahead of schedule). Highlights also include MassDEP permitting additional clean energy on landfill projects that bring the total permitted since program inception to 48.9 megawatts, or 98% of the 50 megawatt goal set through the Clean Energy Results Program for siting clean energy on environmentally challenged property.

## **PROGRAM DEVELOPMENT ACHIEVEMENTS**

During this second reporting period MassDEP continued to expand its efforts under the Clean Energy Results Program. The high-level management team (consisting of senior officials from DOER, the Massachusetts Clean Energy Center (MassCEC), and MassDEP) continued to meet bi-weekly to ensure agency clean energy work across the three agencies is fully aligned.

### **Internal Cross-Agency Training**

A comprehensive capacity-building program was developed this quarter to ensure designated agency clean energy staff has comprehensive, up-to-date expertise in the areas of clean energy and energy efficiency. This training program ensures MassDEP is fully aligned with DOER and MassCEC in communicating the Commonwealth's clean energy goals, policies, and programs to the public.

During this reporting period MassDEP led efforts to design training to provide staff from all three agencies with fundamental literacy in key program areas. Those areas include: roles of each agency, clean energy technologies, energy efficiency, financial and technical support for siting clean energy technology, and associated environmental regulatory issues.

Staff worked with DOER to coordinate all logistical training components, including webinar, videotaping, and room reservations. The first session of training was kicked-off by the MassDEP and DOER Commissioners on March 29<sup>th</sup>, 2012.

### **Database**

MassDEP, DOER, and EEA IT advanced development of the new MassDEP-DOER Clean Energy Results Database this quarter. This new database will eliminate the need for over three different databases and spreadsheets to track information from MassDEP and DOER agency programs. It will enable streamlined inter-agency sharing of information on activities and outcomes that will save significant staff resources (and paper/electronic resources) that were previously required to manage separate databases. It also ensures that information being tracked by MassDEP and DOER is consistent across programs and agencies.

During this reporting period, the Clean Energy Results Database was expanded from a "mini-project" with a "mini-scope" and moved into the standard project development process by EEA IT. Under the direction of a newly assigned IT Project Manager a team of data architects worked several hours a week with MassDEP and DOER staff to develop draft business requirements documents and map out objectives, scope, workflows and timelines.

The newly developed database will be tested by internal user groups within the next reporting period, with anticipated roll-out late summer 2012.

## Mapping

During this quarter MassDEP Geographic Information Systems (GIS) staff performed several activities in support of DOER and MassCEC mapping efforts. A GIS subgroup was formed and met to ensure consistency of data and mapping priorities between all three agencies. Meetings were held and work was done to iron out data sources and conveyance of data so that MassDEP could augment its Clean Energy Map of the Month for use by all three agencies. Several other maps were produced for MassDEP and DOER conferences, presentations and other venues.

Clean Energy GIS Maps Produced This Quarter	
Map Name	Description
Statewide Renewable Energy Map	Renewable energy sites within the Commonwealth (updated several times this quarter)
Closed Landfills	Landfill clean energy projects
Public Utility Providers	Gas, electric, and cable providers
Statewide Water Utility Projects	Wastewater and drinking water facilities use clean and efficient sources of energy
Thermal Wells	Geo-thermal wells from well drillers database
Alternative fuels	Renewable energy fueling stations
AARA Recovery Funding	ARRA/DOER funded sites
Mean Wind Speeds	Wind currents
Solar Presentation	Solar installation and incentives
Wave Energy	Tidal Speed

### Program Development Accomplishments:

- Comprehensive capacity-building program developed and launched to train MassDEP, DOER and MassCEC staff
- Clean Energy Results Database Business Requirements developed
- 10 clean energy maps produced by MassDEP GIS staff

## MEASURABLE PROGRAM PROGRESS

During this second reporting period, the Clean Energy Results Program continued to make significant progress towards meeting the clean energy and energy efficiency goals set by MassDEP and DOER in key program areas at the launch of the program (described below).

### Environmentally Challenged Property

MassDEP continues to bolster its efforts to encourage new clean and efficient sources of energy at environmentally challenged property. During this reporting period MassDEP permitted an additional three megawatts of clean energy on closed landfills bringing the total permitted since program inception to 48.9 megawatts. This represents 98% permitted towards the CERP goal of achieving 50 megawatts of new clean energy at closed landfills, underutilized contaminated sites (i.e. brownfields), and federal Superfund sites by 2020. Technical assistance was provided to 17 other landfill, brownfield, and superfund projects this quarter that (if constructed) would total an additional 36 megawatts of clean energy production. Five solar PV projects and one wind turbine were under construction at closed landfills at the end of this quarter.

Important steps were taken this quarter to promote green remediation at contaminated sites. MassDEP's energy contractor completed a technical and feasibility study at the Baird McGuire Superfund site in Holbrook focused on MassDEP entering into a Power Purchase Agreement (PPA) to finance solar energy to off-set costs associated with the energy-intensive groundwater pump and treat system. If MassDEP moves forward with this project, it could achieve an estimated return on investment of 10%, and a discount of electricity for MassDEP (the host) between 9-35%. If implemented this pilot would reduce the total carbon dioxide emissions associated with the remedial system by 12%.

This quarter MassDEP met with several clean energy developers to discuss liability concerns associated with reuse of contaminated property for clean energy. MassDEP also launched a comprehensive training initiative in conjunction with the Licensed Site Professional Association (LSPA) targeting over 1,000 hazardous waste site cleanup professionals.

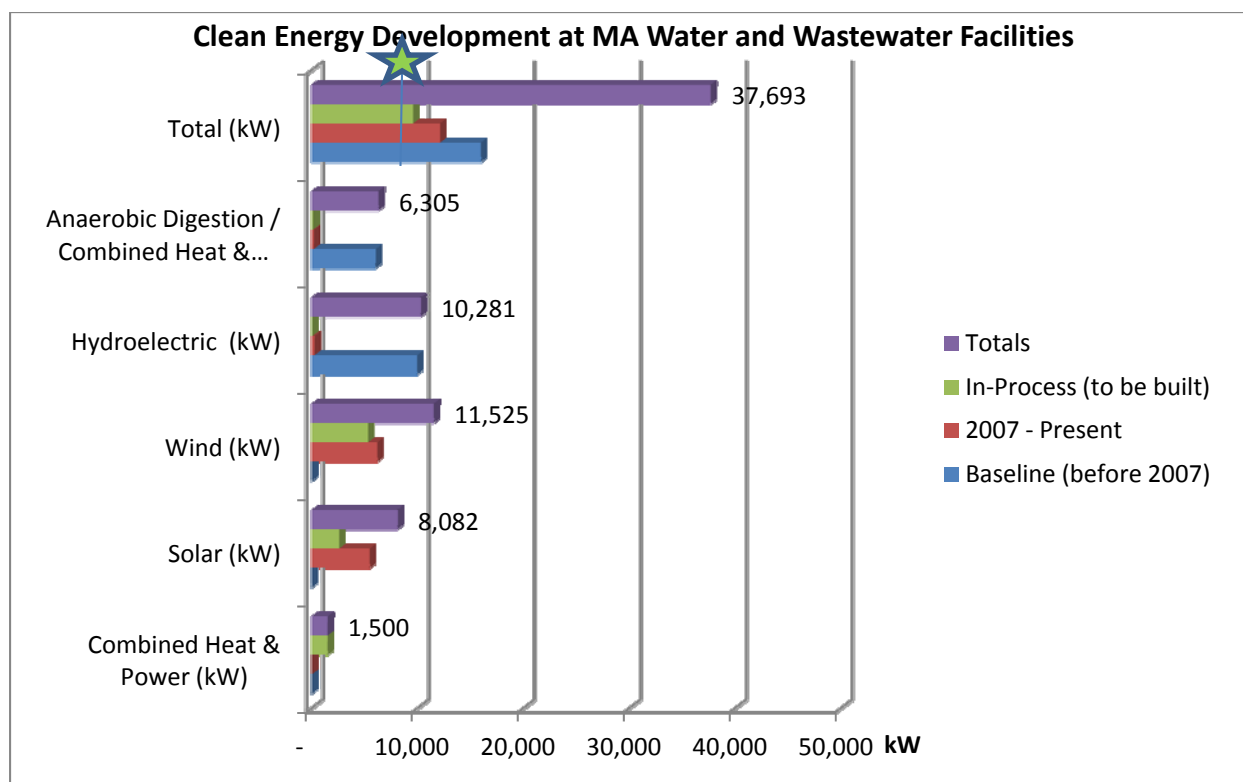
#### Environmentally Challenged Property Highlights:

- Advanced a total of 19 clean energy/energy efficiency projects on environmentally challenged land with the potential for up to 38 megawatts of new clean energy production
- Approved post-closure use permits for 2 solar on closed landfill projects in this quarter totaling 3 megawatts. This brings the total permitted megawatts to 48.9 (or 98% permitted towards the 50 megawatt installation goal)
- Provided technical assistance to an additional 12 landfill projects (post-closure use and landfill gas) with potential for 20+ megawatts future energy production
- Completed the technical and feasibility study for a first-of-its-kind green remediation pilot at the Baird McGuire Superfund site in Holbrook
- Assisted 5 brownfield and superfund clean energy projects, including the 7.5 megawatt Shaffer Landfill in Billerica/Iron Horse Park Superfund solar PV project
- Launched a comprehensive CERP outreach initiative targeted at 1,000 hazardous waste site cleanup professionals (Licensed Site Professionals)

## Clean Energy Potential at Water and Wastewater Utilities

Massachusetts is a national leader in promoting energy efficiency and clean energy development at drinking water and wastewater treatment plants, reducing energy costs at facilities and providing significant greenhouse gas emission reductions. Over the past four years, over 12 megawatts of new clean energy power has been installed at drinking water and wastewater facilities across the Commonwealth, and an additional nine megawatts of new clean energy is slated for development over the next year. Goals established under the Clean Energy Results Program build off of the success and partnerships MassDEP has established in this area.

During this reporting period, MassDEP has taken steps towards the larger program goal of achieving zero-net energy at 20% of Massachusetts’s drinking water and wastewater treatment facilities by 2020. MassDEP just released its intended use plan for the State Revolving Fund (SRF), and that plan calls for funding \$90.7 million in energy efficiency and renewable energy facilities in 71 communities, or almost 22% of total SRF funding for the year. This quarter, MassDEP met and exceeded its goal of increasing the use of renewable energy at drinking water and wastewater treatment facilities participating in the Energy Leaders Programs. As the table below illustrates, 12 megawatts has been constructed at these facilities which represents a 76% increase using the benchmark of 2007. This exceeds original program goal of 50% by 26%, and this was done eight months ahead of schedule.



	CHP (kW)	Solar (kW)	Wind (kW)	Hydro (kW)	AD / CHP (kW)	Total (kW)
<b>Installed (before 2007)</b>	-	15	-	9,960	6,000	<b>15,975</b>
<b>Installed (between 2007 – 2011)</b>	-	5,475	6,200	262	195	<b>12,132</b>
<b>In-Process (to be built)</b>	1,500	2,592	5,325	59	110	<b>9,586</b>
<b>Totals (kW)</b>	<b>1,500</b>	<b>8,082</b>	<b>11,525</b>	<b>10,281</b>	<b>6,305</b>	<b>37,693</b>

During this reporting period, MassDEP also initiated and led an interagency discussion with DOER, EEA, MassCEC, and EPA about advancing “in-line/conduit” hydropower at water and wastewater facilities. MassDEP drafted a plan to evaluate the feasibility and benefit of recovering excess hydraulic energy contained in gravity and pressurized pumping systems at public water suppliers and publicly-owned treatment works facilities in Massachusetts. As a result of this meeting, MassCEC has agreed to fund a consultant study to evaluate the extent of potential “conduit” hydropower applications at Massachusetts’ drinking water and wastewater facilities. A draft scope of work for this MassCEC - funded study has been developed by MassDEP.

MassDEP held an Energy Leaders Forum in New Bedford attended by facility representatives, state and federal officials, and energy providers.

#### **Water and Wastewater Utilities Highlights:**

- 43 projects assisted with potential for 3+ megawatts of new clean energy generation
- Achieved and exceeded CERP goal of increasing renewable energy generation at participating “Energy Leader” drinking water and wastewater treatment facilities by 50% (goal was exceeded by 26% and achieved 8 months ahead of schedule)
- New SRF funding for \$90.7 million in energy efficiency and renewable energy
- Held Energy Leaders Forum at New Bedford’s Wastewater Treatment Plant with 30 facility representatives, state and federal agencies, and energy providers
- Developed scope of work for a new In-Conduit Hydropower Project Study for drinking water and wastewater facilities (MassCEC funding support)



## **Organic Waste Diversion & Anaerobic Digestion/Combined Heat and Power**

MassDEP continues to work closely with its state partners through the Massachusetts Organics Task Force and other forums to tackle regulatory and financial barriers to diverting source-separated organics and siting anaerobic digestion projects. During this reporting period, MassDEP continued to ramp up its efforts to increase energy production from anaerobic digestion and combined heat and power as an important way to achieve both clean energy and solid waste goals. This work was just highlighted in a front page Boston Globe story, with one commenter stating that “this is clearly one of the most ambitious plans of its kind in the country.”

The public comment period for MassDEP’s package of draft regulation amendments establishing clear permit pathways for anaerobic digestion facilities (as well as facilities that recycle and compost material that has been diverted from the solid waste stream) closed on January 23, 2012. MassDEP has reviewed the comments and is developing a final regulation package that will be ready for higher level review later this spring and issued in final form this summer. Specific issues being addressed include the limits on the amount of organic materials that facilities will be allowed to accept, and what level of incoming contamination (non-organic material) and post-processing residual levels will be allowed.

During this reporting period, MassDEP (with assistance from the Organics Sub-Committee) drafted an Organics Action Plan that identifies collection and other infrastructure barriers to development of organic waste diversion. The plan lays out a series of actions that MassDEP and other stakeholders will pursue in order to advance the diversion of organics and foster the development of anaerobic digestion capacity. MassDEP is also using its Organics Subcommittee to assist in the development of the regulatory framework that would result in the banning of disposal of organic materials in landfills and incinerators in Massachusetts. MassDEP met with subcommittee members twice during the reporting period and plans on meeting monthly through fall 2012.

A comprehensive matrix of existing organic diversion and anaerobic digestion funding (developed by MassCEC, DOER, MassDEP, and others) was posted this quarter on MassDEP’s website ([http://www.mass.gov/dep/energy/funding\\_organics.htm](http://www.mass.gov/dep/energy/funding_organics.htm)). A low-interest Recycling Loan Fund Program was established to provide additional financial assistance for organics collection and processing companies, with a maximum loan amount to \$500,000. The Recycling Works Program was also launched to provide technical assistance for food waste diversion to businesses and institutional entities with specific projects in the Devens and Worcester areas.

During this reporting period MassDEP also made progress on studies of anaerobic digestion and combined heat and power potential on public land. MassDEP has partnered with MassCEC, DOER, and the Massachusetts Department of Food and Agriculture to work with DCAM to target appropriate and suitable state-owned land for siting stand-alone anaerobic digestion demonstration projects, with the goal of having three projects up and running by 2015. The original list of 60 sites has been narrowed down to approximately a dozen. MassDEP now plans on reaching out to the host agency along with DCAM to further investigate the sites and meet its target of having several RFP’s issued by year’s end to solicit proposals to build AD facilities on state land.

MassDEP also studied public wastewater treatment facilities this reporting period to assess the potential for increased anaerobic digestion at these facilities. A preliminary draft report has been developed and MassDEP is on track to complete the report within the next reporting period.

#### **Organic Waste Diversion and Anaerobic Digestion/Combined Heat and Power Highlights:**

- Received and addressing public comments on draft regulations to streamline permitting for anaerobic digestion and other organic waste diversion facilities (final regulations expected later in 2012)
- Advanced 7 organics diversion and anaerobic digestion projects (farms, wastewater treatment plants, and other locations)
- Established low-interest Recycling Loan Fund rates for organics collection and processing companies, and raised the maximum loan amount to \$500,000
- Launched Recycling Works Program providing technical assistance for food waste diversion to businesses and institutional entities with specific projects in the Devens and Worcester areas
- Substantially completed a comprehensive study of stand-alone anaerobic digestion/combined heat and power potential on public lands (goal nearly achieved)
- Completed draft of comprehensive study of anaerobic digestion/combined heat and power at state and local wastewater treatment facilities
- Surveyed state agencies including colleges, universities, hospitals and correction facilities to determine the amount of organic waste generated and diverted to establish a baseline for further assistance
- Completed draft fatal flaw analysis for an anaerobic digestion facility at the Hamilton Landfill through a Sustainable Materials Recovery Grant
- Established a grant agreement with the Town of Lexington to assist in issuance of an RFP for anaerobic digestion at the former landfill
- Provided technical assistance to DOER in querying AQ Reports for CHP candidate facilities

## Potential Public Nuisance/Health Impacts from Wind Turbines

In January, 2012, the Independent Expert Science Panel, convened by MassDEP and the Massachusetts Department of Public Health (MDPH), submitted its final report *Wind Turbines and Health Impacts* to the agencies. This 126-page report reflects the work of the seven member panel of medical and scientific experts who were asked to review the scientific literature and information submitted by the public and to prepare the report, which began in July 2011. In addition, two members of the panel, Drs. Manwell and Mills, also submitted a supplemental report, *A Brief Review of Wind Power in Denmark, Germany, Sweden, Vermont and Maine: Possible Lessons for Massachusetts*.

Upon receipt of the reports, MassDEP issued a press release that contained a summary of the results of the study, announced the availability of the report on the agency's website and initiated a process to receive oral and written comments on the report. Due to the extensive interest in the report MassDEP Commissioner Kenneth Kimmell, members of the independent panel, and project manager Susan Santos held a briefing session for the media. In order to solicit public feedback on the Report, three 3-hour public meetings were held in Boston, Bourne and Lee, Massachusetts in February. MassDEP and MDPH senior leadership attended the meetings and provided information on the purpose of the meeting (i.e., to hear comments on the report and people's experience with living near wind turbines). Each meeting was well attended with approximately a total of 106 people providing oral comments. Written comments were accepted until March 19, 2012. In addition, MassDEP staff participated in several other public forums to present the Report's findings and conclusions to the public.

MassDEP is currently in receipt of approximately 500 sets of comments and numerous reports and other information submitted during the comment period. This material is estimated to exceed a total of 1000 pages of information for review and consideration. The subjects covered in the comments submitted include: specific comments on the panel's assessment methodology and report content; numerous challenging questions regarding the panel's findings and conclusions; detailed comments on noise measurement, alternative best practices; and recommended next steps.

With respect to next steps, MassDEP has assembled a 7-member team of engineers, researchers and legal staff who are actively reviewing and summarizing the comments received. They will also generate a list of the most helpful suggestions to assist with next steps. MassDEP will also meet with MDPH and members of the panel to receive their feedback on the summary of comments. MassDEP will prepare a general response to comments document and proposed next steps with input from MDPH, EEA and DOER.

In addition to the work related to the Independent Health Panel Report, MassDEP continues to provide technical assistance to municipalities and other partners to help interpret the agency's noise policy and applicable regulations. During this reporting period MassDEP assisted the MassCEC in development of a scope and methodology for an acoustic monitoring study of operating turbines that the agencies plan to jointly undertake. In addition, staff from MassDEP's Southeast Regional Office conducted noise monitoring of the Wind Turbine #1 at the Town of Falmouth Wastewater Treatment Plant. This effort involved a significant commitment of time by regional staff, including sampling conducted between

midnight and three a.m., to measure and analyze noise levels from that turbine. MassDEP expects to make the results of that sampling effort public later in the spring.

#### **Wind Highlights:**

- 126-page report of the Independent Expert Science Panel submitted to MassDEP and MDPH
- Briefing session and 3 public meetings held (each meeting were attended by 100+ people)
- Presentation at other public forums, including in the Town of Fairhaven and the Massachusetts Wind Working Group
- Review commenced of 360 written comments and 100 oral comments (an estimated 1,000 pages of information)
- Coordinated with MassCEC to develop a protocol for acoustic survey of operating wind projects
- Noise monitoring performed of Wind Turbine #1 in Falmouth by MassDEP Southeast Regional staff
- Acoustic specialist position funded by MassCEC advertised for one-year consulting assignment (*Vacancy Announcement is closed and applications under review*)
- Technical assistance provided to projects to help interpret noise policy and applicable

## Clean Energy at Other MassDEP Regulated Sites

MassDEP made substantial progress promoting clean energy and energy efficiency in several other key program areas during this reporting period. Guidance for siting wind and solar projects on public water supply lands was revised this quarter based on conversations between MassDEP and EEA on related Article 97 issues.

MassDEP is supporting clean energy development by making changes to its regulations, and writing new regulations, that reflect the agency's increasing experience with these types of projects. As part of the current regulatory reform effort, the following are examples of regulation changes that are being developed: The Wetlands regulations (310 CMR 10.00) are being modified to create clear categorical standards for renewable energy projects (wind, solar, tidal, hydro, etc.); the three sets of regulations pertaining to the Chapter 91 Public Waterfront Act (310 CMR 9.00), Water Quality Certifications (314 CMR 9.00), and the Wetlands Protection Act (310 CMR 10.00) are all being modified to contain improved mechanisms for reviewing/approving new energy technologies; and the Solid Waste regulations (310 CMR 19.000) will be changed to convert the current requirement for a site-specific landfill Post Closure Use Permit for solar PV to a streamlined "permit-by-rule." MassDEP hopes to have proposed draft regulations for these changes out for public comment in July or August 2012, with final regulations in place by the end of calendar year 2012.

In addition, since 2008, the Department has helped to establish the policy and regulatory framework for harnessing the potential of offshore energy development through its participation in interagency committees working on the Ocean Management Plan and its regulations. The Department is currently making changes to its own regulations (Wetlands Protection Act, Waterways and Water Quality Certification) to reflect the Ocean Management Plan. To support clean energy technology developers, these three regulations may be revised to provide for a more straightforward permitting process for the testing of new water-dependent renewable energy technologies. More information on MassDEP's regulatory review and streamlining efforts specific to the Clean Energy Results Program will be provided next quarter.

### Other Reporting Period Highlights:

- Revised "Siting Wind and Solar Projects in Public Water Supply Lands" Guidance to reflect language addressing Article 97 discussions with EEA
- Developing draft regulation changes for a variety of program areas (including wetlands, coastal development, and solid waste landfills) that will simplify and streamline the siting of renewable energy projects

## Clean Energy Support Teams

Outreach was a major focus for MassDEP under the Clean Energy Results Program during this quarter. Clean Energy Support Teams were established to provide project proponents and other parties with a range of MassDEP expertise on the environmental and regulatory aspects of clean energy projects. In order to streamline MassDEP responses and outreach, Clean Energy Support Team “leads” were assigned in each bureau, office and region and subject matter experts (with specific regulatory and scientific expertise) was identified. A tracking system was established to record outreach efforts by team members which will be integrated into the Clean Energy Database once developed.

The Clean Energy Support Team leads met four times this quarter to outline roles and responsibilities and create outreach plans that identify needs for written materials. A business card specific to these teams was produced by MassDEP which has been distributed at conferences and other venues this quarter. Teams evaluated the need and timing for outreach material over the upcoming year. Priorities include:

- Handouts to support future Renewable Energy at Closed Landfills workshops;
- Outreach materials on converting food waste and other organic materials to renewable energy (including case studies of examples in North America);
- Guidance to address perceived issues related to siting solar PV projects;
- Revised noise guidance for wind turbines; and
- Liability guidance for clean energy developers interested in siting on contaminated land regulated under state and federal cleanup programs.

Outreach was conducted at over 15 conferences and workshops across the Commonwealth and future outreach opportunities were identified.

### Other Reporting Period Highlights:

- 7 (4 regional and 3 Boston) Clean Energy Support Teams were established
- Outreach tracking system developed that will be integrated into Clean Energy Results Database
- Over 15 presentations given related to Clean Energy Results Program and support teams (including Mass Health Officer Association, Massachusetts Municipal Energy Group, MA Water Resource Commission, Northeast Municipal Recycling Council, NE Electricity Restructuring Roundtable)
- Future outreach opportunities were identified at an additional 12 associations and organizations throughout Massachusetts
- Business cards and CERP information materials were developed and were distributed at events reaching 800+ attendees and potential renewable energy project proponents
- Draft CERP outreach plans were developed incorporating input from regional MassDEP and Green Communities Program staff which outlined priority outreach activities for the year and associated materials to be developed.
- An Anaerobic Digester workshop with representatives from industry, state and federal government was planned to share current information on advancements in the technology. The workshop will be held on May 8<sup>th</sup> and current enrollment is 60+.