

UMASS CLEAN ENERGY EXTENSION

Quarterly Progress Report to MA Department of Energy Resources

Period ending March 31, 2018

Contacts: Dwayne Breger, Director, dbreger@umass.edu 413-545-8512
Prashant Shenoy, shenoy@cs.umass.edu, 413-577-0850

This Progress Report provides a summary of work accomplished by the UMass Clean Energy Extension (CEE) during the period January 1, 2018 to March 31, 2018.

During this reporting period, the Clean Energy Extension continued its support of the Mohawk Trail Woodlands Partnership (MTWP), advanced efforts in support of clean heating and cooling markets, made significant progress in support of the SMART solar-agriculture dual-use program, and continued working with Clean Energy Corps students engaged with Clean Energy Site Assessments (CESAs) a range of research and outreach activities. Some key highlights, further discussed below for this reporting period include:

- Advanced collaborations with farmers, developers, UMass Agricultural Extension, DOER, and Massachusetts Department of Agricultural Resource (MDAR) to develop tools and guidance for those considering dual-use PV system under the forthcoming SMART program.
- Drafted a series of seven fact sheet addressing various aspects of the dual-use solar-agriculture applications.
- Completed and delivered an *Energy Storage and Battery Test Facilities: National Benchmarking Report* for the Special Legislative Committee in coordination with MassCEC, DOER, and Representative Solomon Goldstein-Rose.
- Conducted four community site visits and associated energy analyses as part of Professor Ben Weil's Clean Energy Corps course.
- Supported one graduate student and four undergraduate students to assist with Community Choice Aggregation analysis, clean heating & cooling screening tool development, report writing, and independent research projects.
- Submitted a \$431,161 grant proposal to the U.S. Forest Service Wood Innovation Grant Application program entitled *Jump-Starting the Wood Fuel Supply Chain in Western Massachusetts* for a project focused on strategic expansion of wood energy markets.

- Secured approvals and conducted air emissions monitoring at two wood pellet boiler sites, and deployed mobile monitoring lab, in coordination with Rick Peltier’s team and mobile monitoring laboratory.
- Advanced collaboration planning efforts with DOER and MassCEC to support market development for clean heating and cooling technologies in central and western MA. Developed and drafted a Clean Heating and Cooling fact sheet to be used as a market education and outreach.
- Met to discuss synergies and potential collaborations between CEE and the MassCEC Innovation & Industry Support team led by Ariel Horowitz.

1. Extension Administration and Management

CAFE Board of Public Overseers – CEE Reporting

The Center for Agriculture, Food and the Environment, CEE’s parent unit, meets quarterly with a Board of Public Overseers. CEE (Strong) attended the CAFE Board of Public Overseers meeting in Shrewsbury on February 28. BOPO was created in 1997 to give stakeholders in UMass Extension areas a formal advisory role. The Board, a majority of whose members are appointed by the Governor, advises the UMass Chancellor and the Extension staff on goals, budget, and program. CEE joins CAFE senior staff at these quarterly meetings and provides highlights and updates on activities and progress, including at the July 6 meeting this period. Information, membership, and minutes on the board is available at <https://ag.umass.edu/advisory-groups/umass-extension-board-public-overseers>.

DOER Review Meeting

CEE (Breger, Strong, Shenoy) met with DOER Commissioner Judith Judson (with Burgess, Judge, Lutes) on March 30 to provide an update on CEE’s work, proposals, and financial status. The meeting was a valuable opportunity to inform the Commissioner of our role and work, and to review an amendment to our ISA to extend the end date and to discuss the potential for additional funding.

2018 Work Plan

CEE reviewed and finalized its 2018 Work Plan in January.

2. Public Events and Outreach Activities

During this reporting period, CEE staff and affiliates have engaged in the following public events.

Event	Date and Location	Extension Presenter/Attendee	Presentation Title	Audience	Estimated Attendance
Association of Energy Engineers Annual Energy Forum	January 10, Waltham	Mattison	Attendee	Energy engineering industry members	
DOER Renewable Thermal Stakeholder Information Session	January 18, UMass Amherst	Beebe, Breger, Strong	Attendee	CH&C Stakeholders and General Public	40
Environmental Business Council (EBC) – Energy Resources Program	January 26, Brown Rudnick, Boston	Breger	Chaired/Moderated Program on Renewable Thermal	State agencies, legal/finance consultants and businesses, renewable thermal stakeholders	40
Northeast Dairy Summit	February 12, Norwich, VT	Mattison	Energy Efficiency Opportunities in Dairy Facilities	Dairy industry representatives	60
MassDEP VW Penalty Money Spending – Stakeholder Meeting	March 19, Holyoke Community College	Breger	Attendee	Stakeholders	1
Leading By Example Council Meeting	March 20, Boston, MA	Mattison	Attendee	LBE Council Members	30
UMass School of Earth and Sustainability – Lighting Talks	March 21, UMass ILC	Breger	Clean Energy Extension: Driving towards a clean energy economy in Massachusetts	Faculty, staff, students of School of Earth and Sustainability	50
AEE GlobalCon conference	March 21, Boston, MA	Mattison	Energy Efficiency and Use of Metering Tools in Industrial Facilities	Energy efficiency industry members	50
Environmental Social Science Research	March 30, UMass Amherst	Strong	Attendee	Social science researchers and educators	60

3. Green Communities and other State/Municipal Assistance

Mohawk Trail Woodlands Partnership

CEE (Breger) provided an update to the MTWP Advisory Committee meetings on January 9 and March 27.

CEE, with Professor Rick Peltier and his staff, continued deployment of the air emissions monitoring mobile lab in January. Monitoring of two wood pellet boiler sites were completed during this reporting period.

Community Choice Energy (Northampton, Amherst, Pelham)

CEE has engaged with the Western Massachusetts Community Choice Energy organizers to support the towns of Northampton, Amherst and Pelham which have all approved the exploration of a municipal aggregation for electricity with innovative efforts to enhance strategic investments in local energy efficiency, demand reductions, and renewable generation. CEE is providing analytical support, and has been asked to participate in the Task Force recently convened by the towns and the WMACCE organizers.

Green Communities

CEE continues to provide technical assistance to Massachusetts towns in support of Green Communities. During this reporting period, CEE engaged with nine non-MTWP communities to support their Green Communities reporting processes and general clean energy activities.

In conjunction with town officials, CEE (Strong and Beebe), graduate student Jeremy Price, and undergraduate Matt Raymond continued to develop the *Montague, MA Energy Infrastructure Asset Mapping Progress Report* – a draft report examining municipal building energy loads and strategic opportunities to reduce energy use and adopt clean energy.

As part of Green Communities or outside this program, CEE staff and affiliates have engaged with the following communities.

City or Town	Status	Technical Assistance
Ashfield	Clean Energy Site Assessment	CEE coordinated a Clean Energy Site Assessment of the Ashfield highway garage as provided by Prof. Ben Weil and the Clean Energy Corps.
Conway	Green Communities Annual Report support.	CEE provided Green Communities Annual Report support to Conway.
Four Rivers Charter School	Clean Energy Site Assessment; Review of RFP development for solar PV installation	CEE coordinated a Clean Energy Site Assessment of the Four Rivers Charter School as provided by Prof. Ben Weil and the Clean Energy Corps; Breger/Strong reviewed school’s objectives and scope for RFP development for solar installation.
Goshen	Clean Energy Site Assessment	CEE coordinated a Clean Energy Site Assessment of the Goshen highway garage as provided by Prof. Ben Weil and the Clean Energy Corps.
Northampton Public Schools	Clean Energy Site Assessment	CEE coordinated a Clean Energy Site Assessment of the Northampton’s JFK Middle School as provided by Prof. Ben Weil and the Clean Energy Corps.
Pioneer Valley Regional School District	Energy efficiency retrofit support.	CEE, Prof. Ben Weil, and the Clean Energy Corps continued to provide technical advisory services to PVRSD regarding proposed energy efficiency retrofit efforts.

Shelburne	Municipal Energy Assessment	CEE (Breger) presented MEA report and findings to town selectboard and responded to questions and comments.
Southampton	General support	River communicated with Ed Gibson, Town Administrator, to review results of the Southampton Municipal Energy Analysis.

4. Business Outreach and Support

The Clean Energy Extension staff held substantive direct interactions with the following businesses, state entities, and other organizations.

Entity and Attendees	Date and Format	Extension Staff	Purpose and Outcomes
Environment Mass, Ben Hellerstein and Meghan Hassett	January 8, CEE offices	Breger, Strong	Part of Ben/Megan western MA tour. Discussed mutual areas of work and opportunities for coordination.
DOER	January 17, meeting at DOER offices	Mattison	Discussed CHP Alternative Portfolio Standard data update and analysis project.
Environmental Business Council of New England	January 26, Boston	Mattison	Discussed renewable thermal technologies market development.
Pollinator-friendly PV Planning Meeting (UMass, Hampshire College, NRCS, AG's office, others)	January 30 & March 14, CEE offices	Dowling, Breger, Strong	Discussed development of voluntary pollinator-friendly certification system for PV facilities in MA.
MassCEC Innovation & Industry Support team	January 31, UMass conference room	Beebe, Breger, Kosanovic, Mattison, Shenoy, Strong, Weil	Met to discuss synergies and potential collaborations between CEE and the MassCEC Innovation & Industry Support team led by Ariel Horowitz.
New England Forestry Foundation (NEFF)	February 2, conference call	Breger, Strong	Planning meeting for the Massachusetts Cross-Laminated Timber Life-Cycle Analysis project.
EPA Region 1 and UMass Lowell staff	February 5, Boston	Mattison	Discussed collaborations' current pollution prevention work in food industry and upcoming grant proposal.
DOER Green Communities Technical Assistance Meeting	February 13, Worcester	Strong	Discussed challenges and successes with Green Communities Municipal Energy Technical Assistance grant program.
National Renewable Energy Laboratory, InSPIRE Program	February 15	Breger, Dowling, Strong	Discussed NREL lessons learned and sources of support for solar-ag dual-use program development.
MassCEC	February 21, Boston	Mattison	Discussed MassCEC-CEE collaboration on advancing clean heating and cooling initiatives.
Pioneer Valley Planning Association	February 22, Springfield	Strong	Met with PVPC staff and partners to discuss CEE's role in updating the Pioneer Valley Climate Action and Clean Energy Plan.
HCG (pka, Hampshire Coalition of Governments)	February 27, CEE	Breger, Strong, Beebe	Introduction to new Director of Energy Operations, Sales and Innovation – Sinead Coleman. Discussed REC/AEC aggregator role.

Skyven Technologies	March 5, Conference call	Beebe, Breger, Strong	Met with Skyven team based on referral from MassCEC Innovation & Industry Support team. Discussed Skyven's solar thermal technology and potential MA demonstration sites.
DOER	March 12, CEE office	Beebe, Breger, McDaniel, Strong	Met with Gerry Bingham of DOER and Carole Collins of Greenfield, MA to discuss barriers and solutions to commercial-scale solar PV interconnection costs and timelines.
DOER – Leading by Example	March 14, conference call	Beebe, Breger, Strong	Call to discuss development of the Clean Heating & Cooling Project Screening tool, user requirements, status, potential pilot sites, and next steps.
Wagner Wood Company	March 26, Wagner Wood office, Amherst	Breger, Strong	Met with company principals to discuss wood energy markets, state programs, and review the company's plan to respond to DOER Renewable Thermal Infrastructure RFR.
Atlas Farm, S. Deerfield, MA	March 29, phone	Breger, Strong, Beebe	Reviewed owner's interest in biomass thermal for greenhouse operations.

5. UMass Clean Energy Corps and other Research Activities

Fifteen students in CEE co-PI and Professor Ben Weil's spring course Clean Energy Corps provided building walkthroughs, energy diagnostics, and energy efficiency and renewable thermal recommendations to five towns (Windsor, Goshen, Ashfield, Northampton, and Shelburne) and two educational facilities (Four Rivers Charter School and the Gill-Montague School District). The towns and schools had approached CEE for such support and energy data was used to identify buildings to target. Findings and final reports to the town will be provided in May.

An undergraduate and a graduate student supported CEE and the Western MA Community Choice Energy group to evaluate statewide electricity municipal aggregations for cost savings and green products and to use GIS to assess opportunities for solar installations in the three towns (Northampton, Amherst and Pelham).

CEE staff and PIs have been engaged with UMass Physical Plant in preparations for the contracting and initiation of the Advanced Commonwealth Energy Storage (ACES) award from MassCEC to implement a 1 MW / 4 MWh Tesla battery for the campus microgrid, CHP, and solar assets. Contract start date is expected in May/June 2018.

CEE (Breger) and Renewable Energy Endowed Chair Professor Krish Thiagarajan (and other collaborators) to submit a concept proposal for a *Design and Business Plan for an Energy Storage and Clean Energy Technology Test Bed Facility* to the 2018 Science & Technology Initiatives Fund from the UMass President's office. Subsequently, the University announced that the 2018 fund has been suspended due to funding constraints.

In coordination with the Executive Office and Energy and Environmental Affairs (Bob O'Connor), CEE (Breger, Strong) submitted a grant proposal to conduct a Greenhouse Gas Life

Cycle Analysis for Cross Laminated Timber (CLT) sourcing, milling, and use in Massachusetts. CEE has partnered with the New England Forestry Foundation and other consultants to carry out this work. An ISA is expected to be executed to start this work in May 2018.

CEE was awarded a Center for Agriculture, Food and the Environment (CAFE) Summer Scholar to support an undergraduate intern for a project on Data Analysis and Best Practices for Transportation Efficiency in Rural Massachusetts. This work is being informed and engaged with DOER Clean Cities Coordinator Steve Russell.