

UMASS CLEAN ENERGY EXTENSION

Quarterly Progress Report to MA Department of Energy Resources

Period ending December 31, 2017

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This Progress Report provides a summary of work accomplished by the UMass Clean Energy Extension (CEE) during the period October 1, 2017 to December 31, 2017.

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

- Finalized and submitted 10 *Municipal Energy Assessment Reports* in support of the MTWP initiative.
- Engaged with nine communities to support their Green Communities designation applications, annual reporting process, and general efforts
- Supported two graduate students and five undergraduate students to assist on MassEnergyInsight data analysis, report writing, and independent research projects.
- Identified and secured approvals for air emissions monitoring at a first set of 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.
- Established collaborations with 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.
- Held a webinar with the U.S. Small Business Administration and state partners to educate food and beverage businesses on opportunities in energy efficiency and sustainability.

- Hired Zara Dowling as a half-time Research Assistant in December. Zara is a PhD candidate in the Department of Environmental Conservation and a fellow in the Offshore Wind Energy IGERT Program at UMass. Zara is assisting with research activities, program design and development, program outreach and education, and administrative support.

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 (Breger) attended the CAFE Board of Public Overseers meeting in Shrewsbury on October 20. 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>.

CEE staff and Principal Investigators held an on-campus mini-retreat on October 16. The retreat offered an opportunity to review work progress, staffing needs, and chart out initiatives for 2018. On November 2, CEE staff participated in a CAFE-wide retreat on campus.

CEE has developed a draft of its 2018 Work Plan which will be further reviewed and finalized in early 2018.

2. Public Events and Outreach Activities

CEE (Breger, Strong, Mattison) attended the UMass and Economic Development Corporation of Western MA sponsored "Innovations and Opportunities in Green Technologies" event on October 17. This networking event offered business and employment opportunities stemming from clean energy, climate change mitigations, water innovation, and green building technologies. CEE successfully made connections between other colleges, business, state agencies, and students.

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

Event	Date and Location	Extension Presenter	Presentation Title	Audience	Estimated Attendance
33rd Annual International Conference on	October 18, UMass Campus Center UMass	Strong	Presentation and discussion on CEE programs	Energy and environmental professionals,	40

Soils, Sediments, Water, & Energy			and MA clean energy industry	students, and researchers	
EBC Energy Resources Program: Energy Storage Innovation – Next Steps and Beyond	October 31, Brown Rudnick, Boston	Breger (attended and helped organize)		State officials, utilities, and financial, legal, industry and project consultants.	30
MA Forest Forum	November 1; Harvard Forest, Petersham	Breger	Update on MTWP activities	EEA, forestry stakeholders	40
Pioneer Valley 100% Renewable Energy Visioning Forum	November 17; PVPA offices, Springfield, MA	Breger; plus attendance by Strong and Weil	Provided final remarks and wrap up to close forum	Climate Action Now, Coop Power, Pioneer Valley Mothers Out Front, Environment Massachusetts Research & Policy Center, PVPC, local legislators, town officials, etc.	50
EDC of Western MA "Innovations and Opportunities in Green Technologies"	October 17; UMass Design Building	Breger (assisted with agenda and outreach)		Local/regional businesses, students, local and state officials	150
State University of New York, Environmental Science and Forestry (SUNY-ESF)	November 30; SUNY-ESF, Syracuse, NY	Breger (invited external reviewer for proposed graduate programs in Sustainable Energy)		Faculty, administration, graduate students from SUNY-ESF	20
Siting of Renewables on Farmland Workshop	December 1; Enfield, CT	Strong		State officials from New England, NY	15
ACES Energy Storage Grant Award Announcement	December 7; UMass Memorial Hospital, Marlborough	Breger attended with UMass Chancellor and Director of Physical Plant		Governor, DOER Commissioner, MassCEC Director, others	100
Webinar hosted by the U.S. Small Business Administration Massachusetts office	December 12	Mattison	Green Your Bottom Line: Improve Sustainability and Reduce Operating Costs in Your Food or Beverage Business	Food and beverage businesses, government agencies	70

3. Green Communities and other State/Municipal Assistance

Holyoke / Holyoke Gas and Electric

CEE PI Shenoy is conducting a study with students to evaluate HG&E transformer loads and potential use of energy storage along with distribution transfers to improve reliability and reduce overloads.

Mohawk Trail Woodlands Partnership

CEE (Breger and Strong) provided an update to the MTWP Advisory Committee meeting on October 3.

CEE staff and the student members of the Clean Energy Corps finalized and submitted 10 *Municipal Energy Assessment Reports* in support of the MTWP initiative.

In agreement with the MTWP lead agencies, FRCOG and BRPC, and in consultation with DOER, CEE has opted to put on hold its solicitation for a consultant to execute a feasibility study for a pellet and dry chip manufacturing facility to serve a regional demand for clean wood energy development. The solicitation will resume after legislative committee action on the pending bill to establish the MTWP.

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

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 designation applications, annual reporting process, and general clean energy activities.

CEE (Strong and Beebe), graduate student Jeremy Price, and undergraduate Matt Raymond delivered 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
Buckland, Charlemont, Colrain, Heath, New Ashford, Peru, Savoy, Shelburne Williamstown, Windsor	MTWP Municipal Energy Assessment Report	CEE delivered a draft or final MTWP Municipal Energy Assessment reports to respective towns in support of both Buckland's participation in the MTWP. In some cases, follow-up presentations or discussions related to the reports were conducted.

Conway	Green Communities Annual Report support.	CEE provided Green Communities Annual Report support to Conway.
Gill	Clean Energy Site Assessment and Green Communities Annual Report support.	CEE and Gill coordinated further analysis of the Gill Elementary School – building on the Clean Energy Site Assessment previously provided by Prof. Ben Weil and the Clean Energy Corps.
Goshen	MEI and Annual Report support.	CEE and the Clean Energy Corps provided MEI and Green Communities Annual Report support to Goshen.
Huntington	Green Communities Annual Report support.	CEE provided Green Communities Annual Report support to Huntington.
Northfield	Community Shared Solar project	CEE staff (Breger, Strong) met with Susan O'Connor of Northfield to support efforts to advance a community shared solar project.
Pioneer Valley Regional School District	Green Communities designation application support.	CEE and the Clean Energy Corps delivered a final PVRSD Clean Energy Site Assessment report and worked with the PVRSD's constituent Green Communities (Warwick, Bernardston, Northfield) to include PVRSD schools in the MassEnergyInsight energy accounting platform .
South Hadley	General support	River met with John Howard about CEE's Municipal Technical Assistance and Green Communities support services.
Southampton	Green Communities designation application support.	CEE drafted a Municipal Energy Assessment in support of the town's Green Communities designation application.

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
DOER and MassCEC	October 2, meeting at MassCEC office	Breger, Strong, Mattison, Beebe	Discuss collaboration on clean heating and cooling market development
Froling Energy	October 18; open house	Beebe	Participated in Open House to learn more about Froling Energy production site for precision dried wood chips
Coalition for Green Capital	October 24; conference call	Breger, Strong	Met with CGC and discussed capital market barriers, green banks, loan programs, and potential areas of collaboration.
New Energy Hydro	October 27; meeting at CEE offices	Breger, Strong	Met with business owners Clayton and Shane Bear to discuss collaborations with MassCEC and Holyoke Gas & Electric
Western MA Community Choice Energy	November 7; CEE offices	Breger, Strong	Overview of CEE and discussion on supporting WMCCE as they develop a Community Choice Aggregation model that emphasizes clean energy and local project ownership.

Hyperion LLC, Michael Lehan	November 16; Hyperion offices	Strong, Breger	Update on NREL grant effort on dual-use agriculture solar arrays, and preparations for SMART program.
UMass Physical Plant	November 16; Physical Plant offices	Strong, Breger, Beebe, Howard	Presentation of final report drafted by CEE student Rebecca Howard detailing opportunities for implementing distributed renewable thermal technologies throughout the Amherst campus.
MDAR (Gerry Palano), DOER (Kaitlin Kelly) and UMass Ag Extension SMART Dual-Use Ag Planning Meeting	November 20, Stockbridge Hall, UMass	Breger, Strong, Dowling	Meeting to discuss strategy, planning and roles in the development and roll-out of the SMART Dual-Use Solar-Ag program.
Patience Wait, SMART Dual-Use Ag Land Owner Meeting	December 5, CEE offices	Strong, Breger, Dowling	Discussed Patient's agricultural land in Northfield, MA – and application pathway for the SMART Dual-Use Solar-Ag program.
Gravity Renewables	December 5, CEE offices	Strong, Breger	Update on Gravity's small-scale community hydro projects and offerings in MA.
U.S. Forest Service Wood Innovation Grant Application meeting	December 13, CEE offices	Strong, Breger, Dowling	Meeting with Adam Sherman of the Biomass Energy Resource Center to discuss collaboration and strategy for submitting U.S. Forest Service Wood Innovation Grant Application in January.
U.S. Forest Service Wood Innovation Grant Application meeting	December 21, CEE offices	Strong, Breger, Dowling	Meeting with Nathan L'Etoile of the Massachusetts Forest Alliance to discuss collaboration and strategy for submitting U.S. Forest Service Wood Innovation Grant Application in January.

5. UMass Clean Energy Corps and other Research Activities

CEE (Breger) is contributing to an NSF Research Traineeship proposal in its new priority research are Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS). The interdisciplinary proposal is being led by Professor Casey Brown in Civil and Environmental Engineering and was given a green light to propose to NSF after a campus-wide competition.

CEE has engaged with the University Physical Plant Director, Sustainability Manager, and staff, to support considerations of clean wood energy use for campus thermal needs. CEE delivered our report (completed by Clean Energy Corps student Rebecca Howard) examining opportunities for decentralized wood heating for strategic parts of campus to reduce capacity strains on the central plant and steam line expansions. This report and concepts has been well-received by Physical Plant which has stated its intent to analyze this approach for a new athletic complex at a remote part of campus, and over time for some other areas of campus. CEE is also engaged with Physical Plant on their on-going study for alternative fuels for the central heating plant which has been revised to reconsider a solid wood option for the plant. Much resistance remains, however, on this option.

CEE has engaged with Representative Solomon Goldstein-Rose and the UMass Office for Research and Engagement to support the legislatively formed battery commission to benchmark existing test facilities in the U.S. For this purpose, CEE interviewed and selected two students to work intensively with staff during the January intersession to research existing test facilities and prepare a report for the commission.