

UMASS CLEAN ENERGY EXTENSION

Quarterly Progress Report to MA Department of Energy Resources

Period ending June 30, 2024

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This Progress Report provides a summary of work accomplished by the UMass Clean Energy Extension (CEE) during the period April 1, 2024 to June 30, 2024.

This report represents the last report filed under the founding 2014 Interagency Service Agreement between CEE and DOER, which expires at the end of this reporting period. Quarterly Progress Reports will continue next quarter under the new ISA.

Externally Funded Project Activities¹

In this section, we provide updates and progress on projects for which CEE has received substantial funding support from outside the DOER Interagency Service Agreement (ISA). We recognize that these activities still rely critically on the ISA for enabling CEE to pursue external funds and to sustain our staff and office needs generally.

Impacts of Dual-Use Solar on Crop Productivity and the Agricultural Economy in Massachusetts and Beyond

Prime Funding: U. S. Department of Energy

CEE, in collaboration with state solar industry partners, state agencies (DOER and MDAR), American Farmland Trust, and UMass collaborators, is leading a \$1.8M research project for *Impacts of Dual-Use Solar on Crop Productivity and the Agricultural Economy in Massachusetts and Beyond*, funded by the U.S. Department of Energy, Solar Energy Technology Office. This quarter, despite the challenges of doing site trials within the constraints of commercial farm operations, we were successful in developing all available site trials. The second year of monitoring was begun on early spinach (with fall broccoli to follow), lettuce, butternut squash, and hay. Pre- and post-construction sampling was carried out on cranberry sites depending on their stage of construction, along with installation of environmental monitoring equipment on one site. We continue to submit detailed quarterly reports on the project to US DOE and contribute to the DOE Solar Energy Technologies Office on their broader agrivoltaics efforts.

¹ Note on External Funds and CEE: An important strategic objective of CEE is to attract funds beyond our ISA with DOER. These external funds are tied to specific scopes of work and displace a portion of CEE core staff salaries from DOER funds; however, the bulk of these funds are typically used to extend CEE's capacities with other faculty, graduate students, consultants, and expenses tied to the project scope.

Offshore Wind Energy Professional Graduate Certificate Program

Prime Funding: UWW Registration Fees; Mass Clean Energy Center, OSW Workforce Development Program (see related MassCEC grant below).

CEE continued to develop the program in coordination with the UMass Department of Environmental Conservation, the College of Natural Sciences (CNS), and University Without Walls (UWW). During this quarter, CEE concluded the Spring 2024 program course (ECO 611 *Offshore Wind Energy: Environmental Impacts, Siting, Permitting, and Stakeholder Engagement*), with enrollment of 53 students (14 UMass graduate students and 39 professional continuing education students), and began the Summer 2024 program course (ECO 612 *Offshore Wind Energy: Project Economics, Deployment, and Business Logistics*), with enrollment of 37 students. This registration sustains the substantial growth of the program.

During this period, CEE (Dilthey, Strong) attended the 2024 International Partnering Forum (IPF) in New Orleans, which is the largest offshore wind energy conference in the Americas. Hosted by Oceantic Network, IPF connects global leaders and businesses in the supply chain, offers networking opportunities, and timely and relevant updates on the industry, from technology and policy to safety and siting. Dilthey and Strong staffed a booth representing the Certificate program, conducted program outreach, facilitated alumni and prospective student connections, and participated in general networking related to the Certificate.

Expanding, Broadening, and Sustaining the UMass Amherst Offshore Wind Professional Certificate Program

Prime Funding: Mass Clean Energy Center, OSW Workforce Development Program

CEE was awarded a grant from MassCEC to expand, broaden, and sustain our Offshore Wind Professional Certificate Program. Further, the award is supporting the development of an [Industry Partnership Program](#) to 1) generate sufficient revenue for our long-term stability and growth, 2) mutually serve diversity workforce goals of CEE and the industry, and 3) further enhance the program's value to industry needs.

During this reporting period, CEE concluded the Spring 2024 course, with enrollment of 53 students, including 6 scholarship students, and began the Summer 2024 program course, with enrollment of 37 students, including 3 scholarship students. Class materials for all three courses have now been adapted to accommodate a larger class size.

CEE continues to participate in focused discussions with MassCEC Offshore Wind Works Community of Practice (CoP), and several members of the CEE team have been attending the National Renewable Energy Laboratory's Offshore Wind Workforce Working Group, where ideas for workforce development are shared across networks and organizations.

Preparing for Success: Restructuring Program Website and Branding, and Opening Undergraduate Pathways (for the UMass Amherst Offshore Wind Professional Certificate Program)

Prime Funding: Mass Clean Energy Center, OSW Workforce Development Program

During this period, CEE began work with the selected vendor, B Strategic, on website design and program branding. We participated in a needs assessment meeting to articulate the goals for this work. We consolidated a list of program students and alumni to be interviewed for promotional

videos which will be posted on the new website. CEE also continued work on developing an undergraduate course focused on the fundamentals of clean energy technologies, careers, and educational pathways.

Supporting Diversity and Inclusion in the OSW Professional Workforce: Continuing the OSW Career Access Scholarship Program

Prime Funding: Mass Clean Energy Center, OSW Workforce Development Program

CEE was awarded a grant from MassCEC to support two cohorts of 6 OSW Career Access Scholars from diverse and disadvantaged communities to participate in our Offshore Wind Professional Certificate program. This quarter, CEE and our team performed outreach to recruit applicants for a first cohort to begin in Fall 2024, and prepared applications for Selection Committee review.

Offshore Wind & Wildlife Science & Collaboration

Prime Funding: Regional Wildlife Science Consortium for Offshore Wind (RWSC)

With Zara Dowling, lead CEE researcher on this project on family leave through mid-September, we do not have an update to report. Zara has been in touch with the project sponsors, and her work on this project will resume upon her return.

Technical Assistance to Lawrence, MA Community Organization for Solar Planning

Prime Funding: National Renewable Energy Laboratory

During this period, CEE worked to finalize two draft project documents in coordination with NREL staff: (1) *Review of Representative Residential PPA Terms in Lawrence and Evaluation of Alternatives*, (2) *GIS Analysis of Community Solar Siting in Lawrence and Adjacent Cities*, and conducted further development, in collaboration with project partner Co-op Power, of the *Community Solar Guidebook* document. With CEE's input, we anticipate that NREL will finalize and deliver these documents to the Lawrence Stakeholder Coalition in Q3 2024.

Green Communities and Municipal Support

In this section, we provide updates and progress on our activities directly serving Massachusetts municipalities in coordination with the Green Communities program. These activities are funded by DOER under the scope of our ISA.

MassEnergyInsight Technical Support

Prime Funding: OptiMiser, as subcontract with DOER Green Communities

CEE continued to provide user support services to Green Communities MassEnergyInsight (MEI) users in partnership with DOER and OptiMiser, LLC. During this quarter, CEE successfully addressed 60 requests for user support across 46 municipalities and other entities. CEE participated in 7 weekly team meetings with DOER and OptiMiser. We continued to work with DOER and OptiMiser to support plans for the new Climate Leaders program and associated additions to MEI. We provided a thorough review and detailed feedback on new MEI reports, and prepared and hosted a webinar on the new reports, attended by approximately 50 MEI users. We made updates to internal documentation on support procedures and made edits to the MEI FAQ to clarify and/or update information, and we began a more thorough FAQ review to update all report references. We published three newsletters with information on new reports and utility changes affecting data delivery to MEI.

Community-Informed Proactive Solar Siting and Financing

Following completion of the *Clean Energy Living Lab: Community Solar Planning Teams* course in Q2 2023 (funded by UMass iCons), CEE continued to provide support to the ten participating municipalities in holding community solar forums, finalizing *Community Solar Action Plans*, and taking next steps to implement priority actions identified in the plans. In this quarter, CEE (Strong) worked with the Town of Montague to refine its Solar Action Plan and develop summary slide presentations of the Plan. In late May, Breger, Dowling, and Strong participated in two Montague Community Solar Forums: one focused on Town department leaders and another designed for the general public.

CEE provided direct support to five communities, including supporting projects conducted by the 2024 Clean Energy Corps class. CEE staff also continued providing follow up with a portion of the ten towns engaged last year for planning solar development using CEE’s toolkit (ag.umass.edu/solarplanning).

City or Town	Technical Assistance
Colrain	Met with a town energy committee member to discuss opportunities for community shared solar and potential project on town landfill.
Hopkinton	Supported completion of UMass Clean Energy Corps study of Hopkinton High School.
Montague	Advised town on next steps to review/finalize <i>Community Solar Action Plan</i> and planned and participated in two Community Solar Forums.
Northampton	Supported completion of UMass Clean Energy Corps study of Smith Vocational & Agricultural High School.
Pelham	Supported completion of UMass Clean Energy Corps study of Pelham Elementary School.

Other Project Activities and Initiatives

In this section, we provide updates and progress on projects and initiatives that CEE pursues using funding primarily supported under the scope of our ISA.

Western Massachusetts Solar Forum

CEE worked with our western MA legislators, Senator Jo Comerford and Representative Mindy Domb to organize a solar forum for local and state government officials, regional planners, environmental groups, solar developers, and the interested public to elevate the discussion and regarding the opportunities and challenges associated with solar PV development and installation in western Massachusetts. During this period, we organized and held Part II of the Forum, a day-long webinar focused on the recent recommendations from the *Commission on Energy Infrastructure Siting and Permitting* and their implications for Western Massachusetts communities, with approximately 25 speakers and 150 attendees. The agenda began with keynote presentations by EEA Undersecretary Michael Judge and the Chairs of the Joint Legislative Committee on Telecommunications, Utilities and Energy Representative Jeffrey Roy and Senator Michael Barrett. See <https://ag.umass.edu/clean-energy/solar-forum>.

ASTGU (Dual-Use Solar) Pre-determination Application Review for DOER SMART

CEE continues to advance discussions relating to dual-use research needs and opportunities with industry, state policymakers, and UMass stakeholders. During this quarter, CEE and extension staff reviewed two dual-use pre-determination applications and began the review of two additional applications.

Pollinator-Friendly Solar Certification Program

During this reporting period, no new applications to our certification program were received. With CEE Zara Dowling who leads this initiative on parental leave through mid-September, CEE staff have organized to cover this work for any new applications or inquiries that are received during Zara's leave.

Clean Energy in the Cultural Sector

CEE is assisting the UMass Arts Extension Services (AES) to support their project funded by a *MassCEC FY23 EmPower Massachusetts Innovation & Capacity Building Grant*. The project is working with Massachusetts non-profit small arts and cultural organizations in their clean energy transition, resiliency, and community and sustainability goals. CEE is providing technical support on an organizational and site survey to understand organizational goals and collect energy data. With AES, CEE has met with partner arts organizations to initiate a collaboration to assess their facilities, operations, programming, and other opportunities for clean energy intervention in alignment with their organizational capacity and priorities.

UMass Campus – Carbon Mitigation Planning and Living Lab: *Putting EVs to Work for Campus and Commuters*

CEE has facilitated a Campus Carbon Zero Living Lab project this academic year with 5 undergraduate students *Putting EVs to Work for Campus and Commuters*. The project was completed this reporting period, and examined the technical, economic, environmental, and policy aspects and impacts of utilizing EV vehicle-to-grid to utilize the anticipated hundreds of commuter EVs on campus in the mid-2030s to mitigate grid electricity consumption and peak demands. The student-led effort provided two undergraduate theses for Commonwealth Honors students, and 4 students with their senior project for the iCons program. Their efforts have set a basis for continued work in this area, and conversations with campus facilities and state agencies on this opportunity.

UMass Biogas Research Hub: Strengthening the Capacity for Small- and Medium-Scale Biogas in the Northeast

CEE is supporting a project led by Martin Hunter, Senior Lecturer, College of Engineering funded by USDA. Project includes research and demonstration of small-scale biogas systems to serve heating and cooking needs in the northeast. CEE provided a summary of Massachusetts RPS/APS incentives and energy/environmental regulations concerning biogas and secured a paid CAFE Summer Scholar student to support the summer research work.

GHG Inventory Tool

CEE staff supported efforts by Bentley University faculty to develop a greenhouse gas inventory tool and online dashboard.

MDAR Agricultural Energy Grant Reviews

MDAR’s Agricultural Energy Grant Program is a competitive grant program that funds agricultural energy projects in an effort to improve energy efficiency and the adoption of alternative energy by Massachusetts farms. During this reporting period, CEE (Strong) agreed to review and score the 2023 round of grant proposals in coordination with MDAR staff. A team grant review meeting and decision-making discussion will be scheduled for Q3 2024.

Business and Community 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
MassCEC	April 3, virtual	Mattison, Breger	Meeting requested by MassCEC to inform industrial decarbonization programing
Clean Energy Climate Action Group meeting hosted by PVPC	April 9, virtual	Mattison	Discussion with municipal representatives and others in Pioneer Valley.
National Renewable Energy Laboratory	April 9, CEE office	Strong, Breger (met separately)	Meetings with Alexis Pescaris, Agrivoltaics and Energy-Water-Land Nexus Researcher at NREL, to discuss CEE’s roles and findings re. agrivoltaics research and SMART program support.
The JPI Group staff	April 10, virtual	Breger Strong	Meeting JPI Group staff to explore Massachusetts clean energy funding opportunities, synergies, and collaborative potential.
UMass Carbon Zero Advisory Board meeting	April 10, virtual	Breger	CEE is member of UMCZ Advisory Board which meets regularly to receive updates and offer input to campus planning to meet carbon zero commitments.
38 Degrees North	April 11, virtual	Strong, Breger	Provided solar development company pursuing agrivoltaic projects in MA with information about the SMART incentives, process, and market conditions.
MassCEC - MA OSW Plan Stakeholder Session	April 17, virtual	Breger	To solicit feedback on the topic of workforce development for the Massachusetts Offshore Wind Strategic Plan.
Farm Progress (journal)	May 1, virtual	Breger, Strong	Met with journalist preparing article on agrivoltaics interested in our research and market awareness.
Colrain Energy Committee member	May 13, virtual	Breger	Discussed opportunities for community shared solar and project on landfill.
MassCEC Offshore WindWorks Community of Practice Meeting	May 15, IBEW, Taunton	Dilthey	Participated in CoP meeting and networking.
Montague Solar Forum – Town Department Leaders	May 15, virtual	Breger Strong	Presentation and discussion of the Montague Solar Action Plan for town department leaders.
Mott McDonald staff	June 18, virtual	Breger Strong	Discussion regarding the UMass OSW Professional Certificate, the Industry Partnership Program, and collaborative possibilities.
CVE Group staff	June 28, virtual	Breger Strong	Meeting to discuss CEE’s Pollinator-Friendly Solar Certification program and CVE’s experience and questions regarding pollinator-friendly solar development.

Public Events and Outreach Activities

In this section, we itemize significant public-facing events and outreach activities in which CEE participated.

Event	Date and Location	Extension Presenter/ Attendee	Presentation Title/Topic	Audience	Estimated Attendance
Talk of the Town, WHMP Radio Show	April 2, WHMP studio, Northampton	Breger	Electric Vehicles – Hosted discussion with two other UMass guests.	Radio listeners	unknown
IPF 2024 Oceanic Offshore Wind Conference	April 22-25, New Orleans, LA	Strong, Dilthey	Program outreach, alumni connections, and general networking related to the UMass Professional Offshore Wind Professional Certificate	Offshore wind industry stakeholder	200
Farm Energy Hearing: 21st Century Agriculture Commission	April 30, virtual	Breger	Testimony on CEE farm energy support, and review of agrivoltaics in MA.	Legislative co-chairs and members and Commissioners	15
MA Cross-Extension Gathering	May 21, South Deerfield, MA	Strong, Breger, Kraus	Summary of CEE’s history, programs, and activities.	Staff and faculty from Cape Cod Cooperative Extension and UMass Extension.	50
Western Massachusetts Solar Forum, Part II	June 4, virtual	Breger, Strong, Kraus	PV development in Western MA	Municipal representatives, elected officials, policymakers, planning agencies, environmental groups, solar developers, general public.	150

Prospective Activities and Proposals

In this section, we provide updates and progress on proposals and collaborations that CEE pursues for prospective funded work to support CEE directly or in collaboration with activities led by other units on campus.

U.S. Department of Agriculture - Natural Resources Conservation Service (NRCS), FOA: Energy Efficient Agricultural Operation Technical Assistance Massachusetts

CEE submitted a proposal in June in response to the USDA NRCS funding opportunity for up to \$400,000 over 5 years. CEE proposal was titled *Providing Clean Energy Extension to the Massachusetts Farm Sector*.

U.S. DOE Offshore Wind Academic Center for Reliability and Resilience of Offshore Wind (ARROW) Center of Excellence

CEE previously contributed to a proposal from UMass, led by the UMass Wind Energy Center (WEC), to the U.S. Department of Energy Wind Energy Technology Office. With this project now funded, with matching funds from the MassCEC, CEE has provided input to the WEC contracting process with US DOE. The Center of Excellence is anticipated to launch in fall 2024. CEE's role in the Center is focused on supporting OSW professional education for workforce development.

U.S. Department of Energy, Renewable Energy Siting through Technical Engagement and Planning (R-STEP Round 2)

CEE worked closely with DOER and other partners to help DOER develop and draft a state response to provide for strategic solar siting and planning across state, regional and local levels across Massachusetts. The proposal builds on and refines the proposal submitted by DOER under the R-STEP Round 1 solicitation. The Round 2 proposal, *Communities Network: Supporting Community-Led Energy Siting through Learning Network and Shared Tools*, is expected to be submitted by DOER in Q3 2024.

Nathan Cummings Foundation, Funding Program in Racial Justice, Economic Justice, and Environmental Justice

In coordination with the Town of Amherst, CEE submitted a Letter of Inquiry in April to the foundation titled *Solar as Reparations: Putting Solar to Work for Equity and Local Economies*. The project would leverage the town's reparation funds to support solar business and projects developed and owned by the town's African Heritage community. The foundation has not made decisions on this grant round to date.

University-based Proposals and Initiatives

CEE is engaged with university programs and initiatives, including:

- Energy Transition Institute, Steering Committee
- Wind Energy Center, Advisory Committee
- UMass Carbon Zero Advisory Board
- UMass Sustainability Strategies

Student Engagement

In this section, in keeping with our mission to support students and workforce development, we list graduate and undergraduate students who have engaged with CEE during reporting period. Given confidentiality concerns, we provide only the students' initials in this publicly accessible report.

Student Initials, Status	Department	Extension Staff Mentor	Project Description
M.D., Graduate Student	Environmental Conservation	Breger, Strong	Support pedagogy and instruction of OSW Certificate program courses.
N.P., Undergraduate	Environmental Conservation	Breger	Completed work this period with CEE and Town of Amherst on analyzing survey results on energy issues, rental properties, and landlords.
5 Student Research Group, Undergraduate	Commonwealth Honors College, iCons, interdisciplinary	Breger	Putting EVs to Work for Campus and Commuters – integrating EV/V2G as storage to serve campus electrification and enhance car ownership. Student project completed at end of spring semester.
E.R., CAFE Summer Scholar, Undergraduate	Environmental Science	Breger	Biogas research and demonstration project, with Martin Hunter.
J.D., Graduate RA	Environmental Conservation	Dowling	Develop materials to support RWSC Bird & Bat Subcommittee
L.H., Graduate RA	Organismal and Evolutionary Biology	Dowling	Support Offshore Bat Working Group