

UMASS CLEAN ENERGY EXTENSION

Quarterly Progress Report to MA Department of Energy Resources

Period ending March 31, 2024

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This Progress Report provides a summary of work accomplished by the UMass Clean Energy Extension (CEE) during the period January 1, 2024 to March 31, 2024.

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, a Technical Summary Report on results for butternut squash, lettuce, and broccoli was completed and delivered to U.S. DOE. Further data analysis is being conducted on these crops as well as the hay crop at an additional agrivoltaic site. During this period, we also completed our Continuation Application and review with U.S. DOE, which was approved and processed to unlock our final Budget Period 3 funding.

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 76 requests for user support across 57 municipalities and other entities. CEE participated in 11 weekly team meetings with DOER and OptiMiser. We did extensive work with DOER and OptiMiser to support plans for the new Climate Leaders program and

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.

associated additions to MEI. We made updates to internal documentation on support procedures and made edits to the MEI FAQ to clarify and/or update information. We published two newsletters: one with a reminder to complete the survey on the new web-based annual reporting system, and one regarding utility changes affecting data delivery to MEI. We shared the survey results with DOER and OptiMiser, and we began to analyze and develop plans to address the user feedback.

Community-Informed Proactive Solar Siting and Financing

Prime Funding: iCons Program, UMass

Following completion of the *Clean Energy Living Lab: Community Solar Planning Teams* course in Q2 2023, 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 staff (Dowling, Strong) worked with Colrain and Montague to finalize Solar Action Plans and plan for spring Community Solar Forums.

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 began 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). This registration sustains the substantial growth of the program.

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 began the Spring 2024 course, with enrollment of 53 students, including 6 scholarship students. Class materials for all three courses have now been adapted to accommodate a larger class size. We continued to solicit and incorporate input from industry colleagues to refine the curriculum, and further increased our emphasis on DEI and workforce equity in this semester's curriculum. We advanced strategizing and planning around the creation of a new undergraduate OSW course.

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 issued a Request for Proposals for website design and program branding to a targeted group of vendors; based on a lack of vendor responses, CEE issued a revised RFP with a narrower scope to a larger group of vendors; a vendor was selected in March. CEE also began work on developing an undergraduate course focused on the fundamentals of clean energy technologies, careers, and educational pathways.

Offshore Wind & Wildlife Science & Collaboration

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

During this period, we held three meetings with the RWSC Bird & Bat Subcommittee, addressing offshore wind research priorities related to birds and bats. The RWSC 2024 Workplan was edited and finalized. RWSC's Offshore Bat Working Group continued development of guidance for deployment of acoustic detectors for bat monitoring equipment offshore. CEE staff (Dowling) participated in two bat working group meetings to present on RWSC offshore wind/bat activities and solicit feedback on acoustic monitoring guidance. CEE staff and graduate students continued development of additional materials to support the Subcommittee, including identifying experts in particular avian taxa, compiling information on active bird/bat research projects along the U.S. Atlantic Coast, and updating the organization's list of relevant bird species.

Technical Assistance to Lawrence, MA Community Organization for Solar Planning

Prime Funding: National Renewable Energy Laboratory

During this period, CEE provided a summary presentation of project deliverables to the Lawrence Stakeholder Coalition and NREL staff on February 14. CEE also revised 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 Q2 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.

In addition to our MEI and Climate Leaders support work described above, 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	Advised town on finalizing <i>Community Solar Action Plan</i> and planned Community Solar Forum.
Hopkinton	Supported 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 Community Solar Forum.
New Salem	Assisted with development of RFQ to use META grant on municipal building audits.
Northampton	Supported UMass Clean Energy Corps study of Smith Vocational & Agricultural High School.
Pelham	Supported UMass Clean Energy Corps study of Pelham Elementary School.
Shelburne	Answered questions for Shelburne Energy Committee.

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 collated and reviewed participant feedback and input requested during the forum. 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 one dual-use pre-determination application.

Pollinator-Friendly Solar Certification Program

During this reporting period, we continued to field questions and offer technical support to solar developers considering pollinator-friendly development, as well as discuss potential pollinator-friendly solar projects with environmental consultants and municipal board members. Given continued financial uncertainty regarding state pollinator-friendly solar incentives, no new applications to our certification program were received. In collaboration with the UMass Environmental Conservation Department’s DOE-Funded SolWEB study of bird and pollinator activity at solar arrays, we wrapped up field work for one pilot study initiated in 2023 Q2 by a UMass CAFE Summer Scholar. This study focused on tracking bird and wildlife activity at conventional and pollinator-friendly solar arrays using AudioMoth sound detectors and trail cameras.

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

CEE has taken an active role in a set of university-wide committees that have been established by the administration to plan for the campus’ own carbon mitigation and clean energy transition, and to design and establish an integrated “Living Lab” to bring widescale multidisciplinary

learning, research, and engagement of the campus community as a vital part of this energy transition. CEE is facilitating a Living Lab project this academic year with 5 undergraduate students *Putting EVs to Work for Campus and Commuters*. The project will examine the technical, economic, business, 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. Over the first part of the spring semester, the project 1) completed a draft survey of EV drivers on campus, 2) obtained and manipulated data from UMass facilities on campus energy demands and from the state decarbonization plan on future energy loads and supplies, 3) began preparing a spreadsheet model on campus deployment of V2G, and 4) began investigating issues on lifecycle impacts and justice concerns around global battery supply chains.

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
Clean Energy Climate Action Group meeting hosted by PVPC	January 10, virtual	Mattison	Discussion with municipal representatives and others in Pioneer Valley.
PowerOptions and Co-op Power staff	January 17, hybrid	Breger, Strong	Discussed community solar business models and funding sources.
Syris Valentine, writer for Scientific American	January 17, virtual	Dowling	Discussed status of pollinator-friendly solar in MA and nationally
Sun'Agri staff	January 18, virtual	Breger, Strong	Discussed Sun'Agri's agrivoltaic technology, applicability to the Massachusetts market, and collaborative potential with CEE.
Mass Mobility Hub staff	January 19, virtual	Breger, Strong	Discussed Mass Mobility Hub's current programs and plans, as well as potential collaborations with CEE and its efforts to advance a MA Battery Innovation Ecosystem.
WPI faculty (Seth Tuler, Thomas Webler)	January 22, virtual	Breger, Dowling	Discussed solar siting processes and challenges in MA
RWSC Bird & Bat Subcommittee meeting	January 23, virtual	Dowling	Finalized Subcommittee workplan on birds, bats, and offshore wind for 2024
David Fisher, agrivoltaics proponent	January 26, virtual	Breger, Strong	Discussed David's interest and efforts to advance agrivoltaics and pollinator-friendly solar in Pennsylvania, as well as collaborative potential with CEE's agrivoltaics research and outreach programs.
Coalition of Franklin County Energy Committee Members meeting hosted by FRCOG	February 1, virtual	Mattison	Discussion with municipal representatives and others in Franklin County.
Sarah Mills, Graham Sustainability Institute, University of Michigan	February 13, virtual	Breger, Strong	Discussed common areas of work and challenges for clean energy applied research and extension.
National Renewable Energy Laboratory, Alexis Pescaris,	February 26, virtual	Breger, Strong	Discussed Alexis's research developing agrivoltaics project case studies, CEE's

Entity and Attendees	Date and Format	Extension Staff	Purpose and Outcomes
Agrivoltaics and Energy-Water-Land Nexus Researcher			agrivoltaics research and programming, and plans for in-person interviews in April.
University of Michigan, Sarah Lee, Clean Energy Engagement Specialist	February 26, virtual	Strong	Discussed the UMass Amherst Carbon Zero and Living Lab initiatives, as well as similar efforts at the University Michigan.
RWSC Bird & Bat Subcommittee meeting	February 27, virtual	Dowling	Discussed prioritization of bird species for offshore tracking and findings of the NYSERDA E-TWG Avian Displacement Guidance Working Group
MassCEC Offshore WindWorks Community of Practice Meeting	February 27, virtual	Dilthey, Strong, Breger	Networking and planning with grantees and stakeholders of MassCEC OSW Workforce Development
MassHire, Laura Robinson, Franklin Hampshire Workforce Board	February 29, virtual	Breger, Strong	Discussed the potential for CEE involvement in a planned clean energy Innovation Career Pathways (ICP) program at Hopkins Academy in Hadley, MA.
Mirai Solar staff	March 4, virtual	Breger, Strong	Reviewed CEE's role in the MA SMART program, as well as Mirai's agrivoltaics technology, which includes retractable PV panels and greenhouse-integrated systems.
SMART Stakeholder Meeting	March 5, virtual	Strong	Discussion of the MA SMART program and potential program improvements focused on agrivoltaics, including eligibility criteria and program goals.
Western Massachusetts Clean Energy Workforce Summit	March 7, Springfield, MA	Strong	Clean energy stakeholder summit to discuss industry workforce and vendor needs, explore opportunities for collaboration, and facilitate stakeholder networking.
Mass Mobility Hub Battery Roundtable and Networking Reception	March 13, Boston, MA	Breger, Strong	Battery energy storage meeting of industry leaders representing various aspects of the battery value chain, academia and policy makers. Discussion focused on industry status, growth barriers, opportunities, and next steps.
RWSC Bird & Bat Subcommittee meeting	March 26, virtual	Dowling	Discussed offshore bat acoustic monitoring and formation of Avian Observational Surveys working group

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
Northeast Bat Working Group Meeting	January 11-12, Saratoga Spring, NY	Dowling	Bats and Offshore Wind	Bat researchers, environmental consultants, and offshore wind energy developers	60
Berkshire Sustainability Challenge	January 12, virtual	Breger, Strong	Overview of UMass Clean Energy Extension Activities and Entrepreneurial Resources	Berkshire Sustainability Challenge participants and staff	15
Mass Audubon - Growing Solar, Protecting Nature – Community Outreach	January 22, Bangs Community Center, Amherst	Breger	Panelist commenting on Mass Audubon’s report	Amherst and regional community members	50
Lawrence Stakeholder Coalition – Final Project Presentation	February 14, virtual	Benander (CEE contractor) Breger, Strong	Summary of NREL Technical Assistance for Lawrence, MA - Lawrence Stakeholder Coalition Final Meeting	Lawrence Stakeholder Coalition and NREL staff	10
Southeast Bat Diversity Network Meeting	February 15, Hilton Head Island, SC	Dowling	Bats and Offshore Wind	Bat researchers, environmental consultants	60
InSPIRE ASTRO Winter Meeting	February 20, virtual	Breger, Strong, UMass Extension	Provided overview of U.S. DOE funded UMass Dual-Use research project	Agrivoltaic stakeholders throughout U.S.	80
Fab 413, Monte Belmonte Radio show	March 25, virtual	Breger	Joined two other UMass faculty/staff to discuss Electric Vehicles and recent federal rulings.	Pioneer Valley radio listeners	unknown
U.S. DOE, Solar Energy Technologies Office, Peer Review Mtg	March 26-28, Washington, DC	Breger	Poster presentation on Dual-Use research project	DOE SETO leaders and staff, all recent grantees	400

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.

Massachusetts Clean Energy Center, Offshore Wind Works Solicitation

In February, CEE submitted an application under this solicitation to the MassCEC entitled *Supporting Diversity and Inclusion in the OSW Professional Workforce: Continuing the OSW Career Access Scholarship Program*. This application would support two cohorts of 6 OSW Career Access Scholars from diverse and disadvantaged communities to participate in our Offshore Wind Professional Certificate program.

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, to the U.S. Department of Energy Wind Energy Technology Office. During this reporting period UMass was informed by DOE that it was awarded funding to launch the Academic Center for Reliability and Resilience of Offshore Wind (ARROW) Center of Excellence.

U.S. Environmental Protection Agency Region 1, Environmental Justice Thriving Communities Technical Assistance Center (EJ TCTAC)

In a previous reporting period, CEE collaborated with UMass Dartmouth who is leading this proposal to EPA. CEE would have a primary subaward role to provide technical support to environmental justice communities across New England in accessing clean energy federal funding programs. The project would provide UMass Amherst/CEE with \$1.05M over 5 years. UMass Dartmouth and the team awaits a decision by EPA on this award.

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

CEE worked closely with DOER and other partners to develop and draft a response to provide for strategic solar siting and planning across state, regional and local levels across Massachusetts. The state proposal *Empowering Communities: Facilitating Local and Regional Solar Planning to Achieve Statewide Goals* was submitted by DOER. In mid-March, DOER learned that the proposal was not selected for funding. Discussions related to seeking alternative funding sources is continuing.

University-based Proposals and Initiatives

CEE is engaged with university colleagues as participants in the following proposals and initiatives.

Clean Energy in the Cultural Sector. Funded by a *MassCEC FY23 EmPower Massachusetts Innovation & Capacity Building Grant*, CEE is providing technical support to a project team led by UMass Arts Extension Services (AES). CEE has provided assistance to AES 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.

CEE plays an active role in the Steering Committee of the **UMass Energy Transition Institute** (ETI) led by the Colleges of Engineering, Natural Sciences, and Behavior Science, and the School of Earth and Sustainability. ETI is a broad campus initiative to bring faculty across diverse disciplines to collaborate on cutting-edge research focused on encouraging a clean energy transition that increases social equity.

Carbon Zero Living Lab. CEE (Breger, Strong) plays a leadership role in the steering committee established to vision, plan, and establish a Living Lab to integrate academics, research, service, and campus operations as educational and applied learning opportunities associated with the campus goal of achieving carbon neutrality by 2032.

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	Work 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
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