[1]Project Partner Appendix A:
CriticalMass Project Partner Opportunities

Contents

[1] Last updated: 12/18/2025

Instructions and Details

The CriticalMass Program includes a list of Project Partners for the program. This Appendix provides a series of memos from entities that are looking to work with innovative growth-stage companies during CriticalMass projects. Interested Growth-Stage Startups should:

1. Review the attached responses to see if the areas of interest align with your company's capabilities.
2. Develop a short (1-3 page) concept paper (see Attachment A on page 69 for a template guide).
    a. The paper should include an explanation of the type of deployment you envision with the Project Partner, and the proposed or expected role and responsibilities of the Project Partner. Attachment A shows an example of a Concept Paper Template. It is not required that you use this template, but it can be used as a guide.
    b. Consider additionally developing a 3-5 slide deck to introduce your company to the partner.

3. Submit the concept paper and optional deck to **BOTH** criticalmass@masscec.com **and** the relevant Project Parter contact listed below. **Please submit concept papers as early as you are able**, to allow for ample time to co-develop a project ahead of the application deadline. The last possible day for submitting a concept paper is **Thursday,**

February 12th, 5pm. Please use the following format for naming your concept paper: [Company Name] – [Project Partner] Concept Paper.

You may submit multiple concept papers to Project Partners but can only submit up to two full applications to the CriticalMass program.

You can submit general questions to criticalmass@masscec.com. Questions for a Project Partner below should be submitted only following a concept paper submission.

Please note that the Project Partners listed in Appendix A have been recruited and onboarded by MassCEC and have signed Legal documents agreeing to be a Project Partner for CriticalMass. However, MassCEC will not be involved with any contract negotiations between a Project Partner and Grantee. MassCEC makes no representations or warranties regarding, and assumes no liability arising out of the relationship between a Project Partner and Grantee. All partnerships between a Project Partner and Grantee are undertaken at Grantee's own risk.

Project Partner	**Climatetech Topics (detailed in following memos)**
44 Maple Group	Technologies related to: • Electrified process heat • High-efficiency drying • Smart automation and quality • Onsite renewable and resiliency • Carbon capture solutions • Advanced recycling initiatives and circular economy solutions • Sustainable material for solar, wind and energy storage • Role-to-roll enhancements • Waste-to-value Contact information: Michael Merwin, Sr. Director – Technology Solutions Group FHT, Tech Solutions Group, (508) 344-0577, mmerwin@44maplegroup.com
Town of Andover	Technologies that can: • Address decarbonizing housing and buildings • Advance the town's mobility infrastructure • Companies interested in setting up office space or manufacturing in Andover. Contact information: Paul Materazzo, Director of Planning and Community Development, Paul.Materazzo@andoverma.us, 978-623-8651
Berkshire Innovation Center	• Advanced Optics design, testing, and manufacturing

	• Micro-grid and grid-scale battery storage and energy management systems • Solar and renewable energy hardware (e.g., embedded photovoltaics) • Electrification and grid technologies (e.g., smart circuit breakers, EV chargers) • Small scale wind turbines Contact information: Ben Sonse, Executive Director | ben@the-bic.org | 917-628-0483
Boston Housing Authority	• Efficient, electric heating and hot water systems • Insulation technologies • Battery storage and resiliency technologies • Other efficient technologies for building energy management • Storm water management Contact information: Joel Wool, Deputy Administrator, Joel.Wool@bostonhousing.org; Amha Abraha, Sr. Energy Engineer, Amha.Abraha@bostonhousing.org; Nicole Wong, Clean Energy Program Manager,Nicole.Wong@BostonHousing.org
Boston University and the University of Massachusetts Amherst, Massachusetts Green High Performance Computing Center	• Technologies related to demand response • Software technologies related to management of data centers • Technology dissemination practices and consciousness-raising for the public good Contact information: Professor Nathan Phillips, Project Coordinator, nathan@bu.edu, 617-997-1057
BXP	• Retrofitting existing building glazing to decrease energy demand • Retrofitting existing RTUs/HVAC units to support phased electrification, and reduce reliance on fossil fuel-based heating systems • Building envelope retrofits to substantially reduce heating and cooling peak loads, • Energy demand management, • Building automation and controls, • Energy management platforms, • BESS and thermal energy storage, • HVAC system equipment upgrades that lower operating costs, reduce emissions and improve indoor air quality.

	• Contact information: Ben Myers, SVP, Sustainability, BXP, bmyers@bxp.com, 617-236-3387; Neetu Sidarth, Sustainability Director, Energy & Utilities, BXP nsiddarth@bxp.com, 617-236-3432
City of Boston	Priority for resilience-related technologies, specifically related to: • Urban heat mitigation and equitable cooling access. • Stormwater, inland, and coastal flood resilience. • Broader range of technology that addresses resilience issues. The City is also interested in technologies, related to: • Building decarbonization • Low embodied carbon materials for new construction and circular economy • Renewable energy • Climate data and evaluation tools • Zero-emission transportation Contact information: Jessica Morris, Chief of Staff, Environment, Energy, and Open Space Cabinet, jessica.morris@boston.gov | 617-635-3254
City of Cambridge	• Technologies that electrify buildings • Electrification of fleets, including heavy trucks • Thermal energy network technologies • Waste management technologies Contact information: Julie Wormser, Chief Climate Officer Office of Sustainability, jwormser@cambridgema.gov(617) 349-4600
CommonWealth Kitchen	• Solar hot water • Cold air recovery technologies • Anaerobic digestion of food waste • Steam or electric technologies to run kitchen equipment • Ionized water technologies • Battery/solar generator technologies • Air quality and ventilation technologies • Rooftop greenhouse/growing and/or light-colored rood technologies • Robotic inventory control systems • Alternate automated building access systems • Plastic packaging alternatives • Waste management technologies • Solar technologies

	Contact information: Jen Faigel, CEO, jen@commonwealthkitchen.or, 857-231-1863
Department of Conservation and Recreation	• Medium-and heavy-duty vehicles • Insulation, electrical capacity • Solar • Road and sidewalk materials • Water quality monitoring Contact Information: Ryan Kingston, Decarbonization Program Manager, Ryan.C.Kingston@mass.gov, Sarah White, Director of Climate Resilience, Sarah.J.White@mass.gov
Energy New England	Technologies that have the potential to: • Facilitate grid modernization • Enhance energy efficiency • Enhance decarbonization, such as smart-grid solutions and advanced energy storage technologies. • Technologies that can support widespread adoption of electric heating, transportation, and industrial processes while reducing overall energy consumption and peak demand stress on the grid. Contact information: Noel Chambers, CEM, CMVP, CDSM Director, Energy Efficiency and Electrification (508) 698-1233, nchambers@ene.org
Global Partners	Innovative solutions, including: • Driving operational energy efficiency of retail locations • Recycling technologies at retail locations • Any other broader technologies that might address challenges a retailer or small grocery might face. • Products that help meet regulatory and voluntary requirements of low-carbon fuels • EV charging and infrastructure solutions Contact information: James Cater, Senior Director and Sustainability Strategy and Innovation, James.Cater@globalp.com
Holyoke Gas and Electric	• Technologies related to carbon free and renewable energy resources • Innovative battery technologies for peak shaving • Technologies that could reduce electric losses on and improve resilience of its existing distribution network infrastructure • Technologies that could improve building energy efficiency

	Contact information: Point of Contact: Sarah LaRose, Senior Project Engineer, slarose@hged.com, (413) 536-9409
International Brotherhood of Electrical Workers-National Electrical Contractors Association (IBEW-NECA) of Greater Boston	• Innovative solutions that improve the economic viability and ease of developing, designing, and building electrical and energy systems. • Technologies that enhance the underlying economics and performance of electrification projects • Integrated electrical and renewable energy systems • Smart panels and switchgear • Battery energy storage systems • EV charging infrastructure • Microgrid and grid-interactive technologies • Advanced lighting controls • Energy management systems Contact information: Ramsay Stevens, Clean Energy Advisor, ramsay@PDPLatform.com, 561-373-9501
City of Lynn	• Technologies that could improve building energy efficiency • Technologies that improve the experience of public transportation, biking or walking • Sea level resiliency and riverine flooding technologies • Technologies to restore shoreline • Foresty management technologies Contact information: Bill Bochnak, Operations Manager, EDIC/Lynn at wbochnak@ediclynn.org
Leading Cities	• Technology agnostic Contact information: Michael Lake, CEO and President, m.lake@leadingcities.org | +1 617-506-3499
Littleton Electric Light and Water	• LELWD has not yet specified which technologies they are interested in working with and are open to different types of technologies. Contact information: David Ketchen, Assistant General Manager, dketchen@lelwd.com, 978-540-2254
Mass General Bringham	• Solutions that significantly reduce or eliminate carbon emissions • Solutions that provide heat energy, cooling energy and electricity that displaces existing carbon intensive natural gas use • Solutions that cost less than existing grid-based and on-site alternatives.

	• Solutions that meet requirements for reliability and resilience • Solutions that fit within space constraints of existing urban and sub-urban buildings • Resilient solutions that include fossil fuel free heating equipment • Solutions to electrify its vehicle fleet and charging infrastructure. Open to consider hydrogen solutions for fleet decarbonization. Contact information: Dennis Villanueva, Director of Utilities, Energy Strategy & Procurement, dvillanueva@mgb.org, (857) 282-2326
Massachusetts Museum of Contemporary Art (MassMoCA)	• Reduce the energy consumption and carbon footprint of campus buildings, while preserving historic architectural character • Building controls that optimize HVAC • Building envelope improvements that are compatible with historic buildings • HVAC equipment or systems that improve efficiency of existing infrastructure • Load management to reduce energy usage • Electrify fleet and landscape maintenance vehicles Contact information: Andy Schlatter, Director of Facilities and Campus Planning (413) 707-4998; aschlatter@massmoca.org
Massachusetts Port Authority (MassPort)	• Sustainable ground transportation technology • Construction and design technologies and techniques, specifically related to biomimicry and circular design • Carbon sequestration technology • Resiliency strategies for active industrial waterfront properties • Sustainable Aviation Fuel adoption and other aviation technologies Contact information: Meghan Casey, Project Manager, Real Estate and Asset Management, mcasey@massport.com | 617-568-1092
Massachusetts Municipal Wholesale Electric Company (MMWEC)	• Technology that addresses the effectiveness of energy efficiency measures in homes in order to best assist residents and commercial spaces in cost-effectively electrifying. • Heat Pump Performance Technologies • Battery Technologies • interested in hearing from other types of technology providers not listed above.

	Contact information: Zoe Eckert, Sustainable Program and Policy Senior Manager: zeckert@mmwec.org, 413-2181281
Marine Renewable Energy Coalition (MRECo)	• Ocean Renewable energy generation technologies • Technologies addressing energy conversion by tides and waves Contact information: John Miller, Executive Director, mrecnewengland@gmail.com, 508.728.5825
Museum of Science	• Exhaust Flow Technology for Air-Source Heat Pumps • Ground-Source Heat Pumps • Kinetic Energy Capture • Expanded Solar Technologies • Building Optimization Strategies • Artificial Intelligence for Program Optimization Contact information: Robert Behrent, Director, Facilities, Museum of Science, rbehrent@mos.org, 617-589-0151
National Grid Partners	**1. Climate tech / Grid Edge Resiliency and Capacity topic areas:** Technologies that: • Eliminates the need for electrical panel upgrades • Performs intelligent peak shaving to smooth grid demand during charging events. • Supports grid flexibility goals through behind-the-meter energy storage and load shifting **2. Infrastructure Resiliency Topic Areas** Technologies that: • Reduce the cost and complexity of civil construction, including trenching, boring, and backfill. • Improve asset longevity, reliability, and monitoring to enhance total cost of ownership. • Lower operations and maintenance costs for underground electric and gas infrastructure. • Enable faster permitting, planning, and prioritization through advanced data and geospatial tools. **3. Flexible Capacity & Load Relief Topic Areas**

	Technologies that: • Reduce the cost and complexity of deploying flexible capacity solutions, including modular assets, mobile systems, and rapid interconnection. • Identify novel flexibility assets and novel ways of accessing and deploying them. • Improve asset adaptability, reliability, and monitoring to support dynamic load management and enhance total cost of ownership. • Lower operations and maintenance costs for temporary or distributed capacity resources. Contact information: Sander Cohan, Head – Innovation Lab, sander.cohan@nationalgrid.com
Olin College	• Window film/treatment to reduce solar gain for comfort and perhaps to produce energy • Machine learning/AI that optimizes how buildings perform • Solutions for domestic hot water heating – heat pumps, solar thermal, etc. • Geoexchange technology – drilling, piping, heat pumps, system design • Heat recovery technologies for space heating and cooling • Sustainable pavement that prevents ice buildup • Waste management - compost, recycling, trash • Energy storage and peak demand management strategies • Sustainable construction materials and buildings • Renewable energy • Microgrid strategies, systems, or controls • LED lighting and controls • Electric fleet vehicles and charging stations • Sustainable landscaping, fertilizer, irrigation • Campus food production, indoors or outdoors • Platforms that facilitate sustainable procurement Contact information: Claire Rogers, Program Manager, LivingLabPartnerships@olin.edu, 203-885-9850
Saint-Gobain	Technologies that tackle key challenges in material circulation, such as: • Recovery of high-value materials from composite materials • Valorizing composite waste materials into new products

	• Technologies that leverage electrified thermochemical processes to improve the quality and energy-efficiency of material recovery. Contact information: Daphne de La Grandiere, External Venturing Project Manager, daphne.delagrandiere@saint-gobain.com
Shrewsbury Electric and Cable Operations	Technologies that will: • Increase the adoption of energy storage, preferably non-lithium based technology for customers that can participate in demand response or virtual power plant programs • Utility-scale applications for emissions free peak shaving • Vehicle to grid technology • Any technology that enhances the dynamic interaction between a customer and the grid, to mitigate peak demand. Contact information: Patrick Collins, Integrated Resources Analyst, pcollins@shrewsburyma.gov, 508-841- 8313
TRUE Collective	• Energy Storage (Battery and Thermal) • Electric Busses Microgrid • V2G (Vehicle to Grid) Charging • Solar • Demand management (VPP) Contact information: Tanya Lobo, Executive Director, Tanya@thetruecollective.org, Tanya@thetruecollective.org
University of Massachusetts Boston	• Building Integrated Photo Voltaic solutions • Non-polluting insulation coating materials to improve a building's energy efficiency • Other solutions to increase the performance of a building façade • Integrated energy performance platform Contact information: Dr. Shubhro Sen, Executive Director, Venture Development Center, Assistant Vice Provost for Research and Strategic Initiatives, Shubhro.Sen@umb.edu, 617-888-0457 & Dennis Swinford, Director of Campus Planning and Sustainability, Dennis.Swinford@umb.edu, 617-287-5402 Janna Cohen-Rosenthal, Janna.CohenRosenthal@umb.edu, Sustainability & Resiliency Planner
University of Massachusetts Lowell Rist Institute for	Technologies that address: • Climate change mitigation and resilience • Renewable energy

Sustainability and Innovation Hub	• Energy storage and transition • Hydrogen – production, storage, transport • Energy storage and transition • Batteries • Urban agriculture • Wind turbine blades • Advanced drone usage Contact information: Mary Ann Picard, MBA,MS, Executive Director of Innovation, Maryann_picard@uml.edu, (978)934-3403 & Ruairi O'Mahony, Senior Exec Director, Rist Institute, Ruairi_omahony@uml.edu, (978)934-1866
Woods Hole Oceanographic Institution (WHOI)	• Sensor validation and testing for climate, carbon, and energy transitions within the ocean space, • Any technology that requires ocean testing • Technology related to parameter sensing via non-destructive sampling • Autonomous vehicle design technology • Energy efficiency and energy-focused designs for ocean technology Contact information: Leslie-Ann McGee, Chief Innovation Officer, lmcgee@whoi.edu, Anthony Kirincich, Associate Scientist, akirincich@whoi.edu
Non-traditional Project Partners	
XYZER	• Underground submarine transmission systems Contact information: Ali Barooee, PE, Founding Principal and Subject Matter Expert, abarooee@xyzereng.com

44 Maple Group

Point of Contact: Michael Merwin, Sr. Director – Technology Solutions Group FHT

Tech Solutions Group, (508) 344-0577, mmerwin@44maplegroup.com

44 Maple Group is a multi-generational, family-owned portfolio management company dedicated to long-term investments in specialty materials companies. Our businesses operate in over 15 industries, including key markets such as Durable Packaging, Automotive, Aerospace & Defense and Medical. Our companies enable customers to differentiate in their respective markets while making the world safer, more visible and more livable.

44 Maple Group's mission is to accelerate the commercialization of climate technologies by providing manufacturing expertise, prototyping, and pilot lines. They are expanding capabilities in sustainable materials, electrified process heat, high efficiency drying, and automation for quality and yield. Technical barriers where they help bridge include material scalability, regulatory readiness, and the prototype-to-commercial gap.

Problem Statement and Potential Areas of Interest

44 Maple Group is committed to accelerating the commercialization and deployment of climate and industrial efficiency technologies with Massachusetts as a core hub for innovation and impact. While rooted in the Commonwealth, solutions should be scalable for regional, national, and global deployment. In addition to their existing focus, they are broadening the scope to include:

- Manufacturing Energy Reduction: technologies for drying-intensive processes (e.g., high-efficiency industrial dryers, heat-pump, IR/microwave/RF, regenerative or desiccant drying, closed-loop air management) and heat recovery to reduce MMBtu per unit produced.
- Automation for Waste & Throughput: sensing, controls, robotics, and AI scheduling/dispatch that reduce scrap, rework, and idle time while increasing overall equipment effectiveness (OEE) as an indirect driver of energy reduction.
- Circular Materials & Recycling: advanced recycling pathways for plastics and multi-layer composites (e.g., solvent-based delamination, compatibilizers, chemical recycling, re-pelletizing) and design-for-recyclability approaches.
- Waste Reduction & Waste-to-Energy: process-intensification, byproduct valorization, and conversion of non-recyclable residues to useful heat/electricity where appropriate, with strong emissions controls.
- Zero-Waste & Resiliency Technologies: emerging clean/climate technologies that improve decarbonization, operational resiliency, and waste minimization in manufacturing.
- Decarbonizing Technologies & Materials: solutions that deliver heat, cooling, and electricity that displace carbon-intensive natural gas and fossil inputs (e.g., industrial heat pumps, electrified process heat, thermal storage, onsite renewables, microgrids).
- Cost-Advantaged Solutions: offerings that cost less than grid-based and on-site incumbents on a levelized cost and total cost of ownership basis.

They seek solutions spanning advanced manufacturing, circular economy, and facility energy systems. Priorities include technologies that are pilot-ready in real manufacturing settings, improve unit energy intensity, and measurably cut waste while maintaining product quality.

- Electrified Process Heat: high-temperature heat pumps, resistive/induction/IR/microwave heating, thermal batteries, and hybrid configurations with smart controls.
- High-Efficiency Drying: low-temperature dewatering; closed-loop dryer retrofits with heat recovery; humidity/solvent sensing; model-predictive control for residence time/airflow optimization.
- Smart Automation & Quality: inline metrology, machine vision, advanced controls, autonomous material handling, and AI/ML for yield improvement and scrap avoidance.
- Roll-to-Roll Process Enhancements: membranes/films and coatings with reduced cure temperatures, faster line speeds, and solvent/energy minimization.
- Advanced Recycling: solvent-based separation for multilayer films, compatibilizers for mixed streams, depolymerization/repurposing pathways, and closed-loop reintroduction to manufacturing.
- Waste-to-Value: low-carbon WtE options, waste-heat-to-power (e.g., ORC), and byproduct valorization with rigorous lifecycle and air quality safeguards.
- Onsite Renewables & Resiliency: PV + storage, thermal storage, microgrids, and demand flexibility integrated with production schedules.

Town of Andover

Point of Contact: Paul Materazzo, Director of Planning and Community Development, Paul.Materazzo@andoverma.us, 978-623-8651

Andover has long been regarded as a premier place to live, work, study, and visit. The town's historic character, thriving commercial and industrial districts, excellent educational opportunities, tight-knit neighborhoods, and striking natural landscapes provide advantages that have enabled Andover to establish a reputation as one of Greater Boston's most desirable communities.

The Town's use of long-term, strategic planning processes and documents, such as the recently updated Comprehensive Plan sets the high-level goals and vision for Andover's future. It does so by honoring Andover's past and reaffirming the community's core values and priorities. The articulated economic development, housing and mobility goals within the Plan should be especially important to climatetech startups during the current moment in time when there is great uncertainty around global and national policies, economic trends, real estate and demographics because a community's comprehensive plan acts as prospectus. Relevant to the CriticalMass objectives, Andover Comprehensive Plan Vision Statement states:

"As Andover progresses into the future, we envision a community that embraces economic, social and environmentally sustainable growth. We welcome new neighbors and businesses

and strive to preserve and support the history and people who built the strong foundation we enjoy today. By strategically designing and connecting its historic centers, commercial districts, vibrant open spaces, and neighborhoods, we will channel vitality that secures Andover's future while preserving its greatest resources".

Problem statement and potential areas of interest:

Andover's limited diversification in its commercial and industrial districts, particularly in areas focused on specialized laboratories and manufacturing, poses challenges for repurposing older building stock. However, the Town of Andover recognizes a unique opportunity in clean technology and clean tech manufacturing to transform these spaces and address existing vacancies. By leveraging the broad scope of clean tech, the Town aims to promote these facilities as a means to mitigate the impact of cyclical development patterns and strengthen its economic resilience.

Diversify and Strengthen Andover's Economic Community

- Support a holistic economy of employment in science, technology, health care and the arts of attracting a diverse range of industries and cultures to Andover, which includes a business outreach plan, creation of incubator spaces, and removing barriers through zoning changes

Entice Employers to Andover

- Attract employers who bring a greater commercial tax base and can expand employment opportunities, which includes tax incentives to attract employers offering high wage jobs in fields such as manufacturing the technology and evaluating existing infrastructure conditions to ensure capacity for growth

Grow Green Business Initiatives

- Reduce the reliance of Andover's businesses on fossil fuels and expand environmentally friendly and sustainable practices among all Andover businesses which includes providing incentives and advocating for green manufacturing businesses to relocate to Andover, as well as partnering with local schools (and colleges) on creating internship opportunities to connect with local businesses.

Berkshire Innovation Center

Point of Contact: Ben Sonse, Executive Director | ben@the-bic.org | 917-628-0483

The Berkshire Innovation Center (BIC) was established as an independent 501(c)(3) in 2014, with a vision of bridging industry, academia, and governmental partners together to spur regional economic development in the innovation economy. BIC headquarters opened in 2020 at the William Stanley Business Park in Pittsfield, on a brownfield site formerly home to General Electric's Plastics Division. This location is a daily reminder of the importance of investment in the climatetech industry, and the impact a strong manufacturing sector has on its region.

The BIC supports climatetech startups through our three core pillars:

Learning: providing access to human skills training and educational programming to support entrepreneurs, engineers, technicians, and other talent driving regional firms.

Technology: providing access to advanced equipment, technical training, SBIR & STTR research support, design & engineering services, office, and shared & exclusive use lab space.

Community: convening researchers, entrepreneurs, investors and stakeholders to promulgate our local expertise in advanced manufacturing and the development of critical supply chains.

Problem statement and potential areas of interest:

Western Massachusetts is a rural region with a legacy of sophisticated manufacturing. Despite the expertise and industrial capacity of our manufacturing base, there has been a lack of climatetech manufacturing support infrastructure in Western MA that bridges the gap between R&D and commercial deployment. These problem areas are of particular interest to the BIC:

- Grid scale solutions to decarbonize energy generation, storage and distribution, especially to support climate justice in low-income regions and/or propel development & manufacturing of cleantech HW powered by a cost-effective and clean microgrid.
- "Fishbowl Deployments" – As a tight-knit region, pilot studies can be conducted with less outside influence, helping firms collect better data sooner.
- Sustainable materials and circular economy – development of high-performance materials that meet the needs of our manufacturing base with reduced cost to the environment.
- Climatetech hardware startups facing challenges accessing advanced prototyping, electronics, and testing equipment. Hardware is hard – the BIC's in-house expertise, facilities, and network of contract manufacturers can make it easier.

These challenges align closely with the barriers identified by MassCEC, including the difficulty startups face in connecting with demonstration partners, navigating deployment risk, and acquiring market traction beyond TRL 8.

The BIC's interest in a wide range of climatetech technologies and industries reflects the diversity of both the established manufacturing base in Western MA, and of the startups the BIC has engaged with to date. The BIC has actively supported firms, sought out interested parties, and convened stakeholders for the development and/or deployment of:

- Advanced Optics design, testing, and manufacturing
- Micro-grid and grid-scale battery storage and energy management systems
- Solar and renewable energy hardware (e.g., embedded photovoltaics)
- Electrification and grid technologies (e.g., smart circuit breakers, EV chargers)
- Robotics and advanced manufacturing
- Environmental remediation and water treatment

Boston Housing Authority

Point of contact:

Joel Wool, Deputy Administrator, Joel.Wool@bostonhousing.org; Amha Abraha, Sr. Energy Engineer, Amha.Abraha@bostonhousing.org; Nicole Wong, Clean Energy Program Manager,Nicole.Wong@BostonHousing.org

Problem Statement and Potential Areas of Interest

The Boston Housing Authority (BHA) owns and operates close to 10,000 public housing and Section 8 units in the City of Boston. Of these, about 3000 are slated for public-private redevelopment, replacing older and inefficient buildings with new and renovated, highly-efficient housing units and higher density that addresses the housing supply shortage. The BHA is therefore seeking to retrofit and electrify about 7000 existing units through shared public, private and philanthropic investment—a comprehensive public works project that will create green jobs, improve public health and significantly reduce greenhouse gas emissions.

Today, public housing in the Commonwealth faces the twin challenges of an enormous capital backlog and escalating supply and material costs. The BHA estimates its capital backlog to exceed $1,000,000,000, while its annual federal and state capital subsidy, when combined, fall short of $40,000,000. This deferred investment has real and damaging impacts on the incredible, diverse tenants who call BHA home. According to the Boston Public Health Commission's Health of Boston report, the prevalence of asthma among BHA adults is 17.1%,

while among non-assisted renters the rate is 10.1% and among homeowners, 8.8%.[2] The residents of these properties are racially and ethnically diverse, majority people of color, with predominantly female head of households. They are 85% able-bodied and about 15% persons with disabilities, and the median household incomes range from about $22,000 to $24,000 at these developments.

Public housing decarbonization presents an incredible opportunity to address the housing and health needs of extremely low-income and environmental justice communities while safeguarding a critical public asset for the future. Agency-wide, the BHA has adopted a Fossil Free by 2030 target, which is among the most aggressive goals—if not the single most aggressive—for any public jurisdiction in the nation. The BHA has sunset non-emergency gas replacements and will advance all feasible decarbonization projects by this time. For sites where decarbonization funding is not yet available, the BHA is advancing initial technical and design studies to get projects to "shovel-ready" status and implementing interim efficiency measures. From insulation and roofing to electrification, public housing decarbonization projects will reduce mold and indoor air pollution, increase energy efficiency, reduce greenhouse gas emissions, improve climate resiliency by incorporating cooling.

BHA is interested in working with technologies related to efficient, electric heating and hot water systems, insulation technologies, battery storage and resilience technologies and other technologies related to energy efficient with the goal of solving problems related to reducing the cost of decarbonization, improving public housing resiliency, accelerating heat pump deployment and managing stormwater.

Boston University and the University of Massachusetts Amherst, Massachusetts Green High Performance Computing Center

Point of Contact: Professor Nathan Phillips, Project Coordinator, nathan@bu.edu, 617-997-1057

As a sociotechnical system, the electric grid functions as a dynamic interplay of physical and cyber systems, and social behavior. The most finely tuned technical grid can underperform depending on the collective behavior of millions of human users and/or a handful of human

[2] https://www.boston.gov/sites/default/files/file/2023/05/HOB_Asthma_2023_FINAL_May11.pdf

decision makers. Demand Response is a potentially powerful but vastly underutilized tool to reduce energy use and pollution on the grid, and also reduce costs to ratepayers. While demand response has been underutilized for decades in New England and across the nation, the lack of robust demand response has become even more pressing as data centers proliferate and create large new demand, expected to exceed 10% of overall electricity consumption within the coming decade.

Software innovations are occurring at a rapid pace and have already demonstrated successful management of data centers as dynamic, flexible grid assets; yet these innovations are occurring largely without understanding users preferences, customer tolerances and how to mobilize widespread adoption practices

Problem Statement and Technology Interest Areas

Institutions of higher education, including Boston University and the University of Massachusetts, Amherst, have aggressive climate and clean energy targets; yet widespread demand response has lagged behind renewable energy production/procurement and building efficiency upgrades. Part of the problem is simply lack of community awareness and education, including that electricity or computing users simply have not been asked their preferences and tolerances when it comes to computing and AI.

Researchers at these institutions seek partnership with an entity involved in data center demand response, in work that engages multiple university user communities - student groups, faculty engaging in computing-intensive research, staff and data center managers and administrators - among university consortium members of the MGHPCC. They especially welcome applications from entities whose mission it is to serve the public good including meeting climate goals, ensuring affordable access to electricity as a basic need, and including transparent labor and public practices – such as benefit corporations, other such entities.

BXP

Point of contact: Ben Myers, SVP, Sustainability, BXP, bmyers@bxp.com, 617-236-3387; Neetu Sidarth, Sustainability Director, Energy & Utilities, BXP nsiddarth@bxp.com, 617-236-3432

BXP, Inc. (NYSE: BXP) is the largest publicly traded developer, owner, and manager of premier workplaces in the United States, concentrated in six dynamic gateway markets, including Boston, MA. BXP has delivered places that power progress for their clients and communities for more than 50 years. BXP is a fully integrated real estate company organized as a real estate investment trust (REIT).

BXP actively works to promote growth and operations sustainably and responsibly across the six regions. The BXP Sustainability and Impact strategy is to conduct business, the development and operation of new and existing buildings, in a manner that contributes to positive economic, social, and environmental outcomes for the clients, shareholders, employees, and the communities in which it operates. BXP's investment philosophy is shaped by their core strategy of long-term ownership and commitment to the communities and the centers of commerce and civic life that make them thrive. BXP is focused on developing and maintaining healthy, high-performance buildings, while simultaneously mitigating operational costs and the potential external impacts of energy, water, waste, GHG emissions, and climate change.

Problem Statement and Potential Areas of Interest

BXP diligently evaluates climate technology solutions to identify and facilitate the implementation of scalable, replicable technologies that promote market transformation and highlight high-return opportunities for large-scale building decarbonization. Key focus areas include improving efficiency in existing buildings, with an emphasis on HVAC and envelope retrofits to decrease energy demand, support phased electrification, and reduce reliance on fossil fuel-based heating systems. It has been a perennial challenge to allocate the time and resources required to evaluate the landscape of early-stage climate and energy transition-focused companies that have emerged over the course of the last decade, which grew considerably as a result of the policy and investment environment in 2020/21.

Particular areas of interest for BXP are climate technology and innovation that materially advance energy efficiency, decarbonization and resilience of existing buildings through scalable and replicable solutions that align with principles of fiscal responsibility, economic growth, and long-term value creation. Key technologies include building envelope retrofits to substantially reduce heating and cooling peak loads, energy demand management, building automation and controls, energy management platforms, BESS and thermal energy storage, and HVAC system equipment upgrades that lower operating costs, reduce emissions and improve indoor air quality.

City of Boston

Point of Contact: Jessica Morris, Chief of Staff, Environment, Energy, and Open Space Cabinet, jessica.morris@boston.gov | 617-635-3254

The City of Boston is advancing bold climate goals that require transforming the systems that power, move, and protect its communities.

These goals include:

1. Reducing community-wide carbon emissions by 50% in 2030 and 100% in 2050.

2. Reducing municipal emissions by 60% in 2030 and 100% in 2050.

3. Implementing coastal resilience and adaptation projects to close all near-term and long-term pathways.

4. Reducing localized temperatures and increasing access to cooling resources.

5. Mitigating disruption and damage from severe precipitation.

6. Mitigating the impacts of climate change across all neighborhoods and prioritizing resources and investments with a focus on climate justice communities.

The current draft version of the City of Boston's 2030 Climate Action Plan outlines key strategies for the next five years to help meet the City's climate goals, including those that can be supported and accelerated by innovative technologies.

Problem statement and potential areas of interest:

(1) Resilience Technologies (Priority Area):

To improve the quality, lower the cost, and speed the delivery of the City's resilience program and projects, the City seeks to strengthen and scale innovative solutions.

(i) Urban Heat Mitigation

- Near-term urban heat island interventions to enhance public cooling and provide shade and lower temperatures on public streets and public spaces, such as materials that can help cool the built environment, e.g., reflective pavements, cool roofs, etc.
- Innovative solutions to improve the maintenance and longevity of street trees
- Tools that collect, analyze and/or visualize temperature data to inform planning, establish baseline conditions, and track the effectiveness of cooling interventions * Methods to quantify the full impact of heat waves including on health, infrastructure, and equity to support robust cost-benefit analyses

(ii) Coastal and Inland Flooding

- Refining coastal forecasting and modeling, including by expanding the City's collection and incorporation of sensor data
- Engaging residents in planning, supported by interactive visualization tools and participatory platforms
- Lowering the cost and timelines to build solutions, e.g., through new materials, construction methods, etc.

- Improving the maintenance of nature-based infrastructure such as green roofs, living seawalls, and permeable surfaces, which face both technical and funding challenges
- Maximizing co-benefits of resilience investments to deliver a broader range of benefits, e.g., living seawalls
- Addressing water quality issues caused by flooding and storm surges

Other Areas of Interest:

(2) Buildings:

Buildings make up almost 70% of Boston's emissions, reducing these emissions is key to meeting our climate goals and creating a healthier, more resilient city. Specific areas of interest include:

- Scalable retrofit technologies for electrification of heating, cooling, and cooking, particularly for non-BERDO buildings and affordable housing
- Reducing the technical and financial challenges to retrofitting at scale, particularly in a larger, older building stock and households reliant on gas
- Integrating resilience features into building retrofits

(3) Energy

Removing fossil fuels from the grid is essential for a reliable, clean, and sustainable energy future. Specific areas of interest include:

- Distributed energy resources, particularly small clean generation and storage
- District energy, ocean-based, and other thermal network systems

(4) Transportation:

Boston is committed to creating a transportation system that is safe, accessible, and affordable. Specific areas of interest include:

- Fleet electrification, particularly for medium/heavy-duty vehicles
- EV charging expansion, particularly fast charging
- Micromobility and first/last-mile solutions

(5) Recovery and Materials

Boston is committed to creating a circular economy. Specific areas of interest include:

- Low embodied carbon materials for new construction
- Deconstruction and adaptive reuse solutions

(6) Data and Performance:

Climate data can help support real time monitoring, short term forecasting, long term modeling, and project evaluation. Specific areas of interest include:

- Expanding the City's climate data network to support real-time monitoring of flooding and ambient heat data
- Evaluating impacts and success of climate interventions

City of Cambridge

Point of Contact: Julie Wormser, Chief Climate Officer Office of Sustainability, jwormser@cambridgema.org (617) 349-4600

As the host city to MIT and Harvard, Cambridge is a living laboratory for climate tech, policy, and financing. They worked together to sign some of the first and largest virtual power purchase agreements in the country to mitigate their carbon emissions from the Massachusetts grid. They are electrifying their municipal buildings and fleet, including heavy trucks. They have enrolled multiple large municipal buildings to participate in demand response programs to power down their energy use during peak times. They are seeking to site a thermal energy network pilot within Cambridge. They are one of 19 state-recognized Climate Leader communities for their climate commitments.

Problem Statement and Potential Areas of Interest

Cambridge has committed to carbon neutrality by 2050. As well, as we are an international center of learning, they seek those technical, policy, and financial solutions that can be readily adopted by other communities with fewer resources. They are interested in deploying technologies that improve their ability to meet their goals as described below.

Problems based on their greenhouse gas emission inventory:

• 80% of their emissions are from building energy use, of which 50% are regulated in their large, non-residential building performance standard (BEUDO). Their particular challenges include cost-effective building retrofits, grid capacity, innovative building controls management, demand-response strategies, and affordable solutions for residential retrofits. Any new buildings and major retrofits are covered by their fossil fuel-free ordinance and specialized stretch energy code. https://sustainabilitydashboard.cambridgema.gov/category/buildings

• About 10% of their emissions are from transportation. Cambridge enjoys extensive public transit, BlueBikes, and bike land coverage. We also recognize that extreme weather (heat, cold,

precipitation), transit uncertainty, health and safety concerns, and other needs cause residents to continue to use personal vehicles. We also need help with their long-term resiliency strategy as we electrify their municipal fleet.
fleet.https://sustainabilitydashboard.cambridgema.gov/category/transportation

• About 7% of their emissions are from their waste stream. Cambridge just released its zero waste master plan and as of 2024 have been able to divert more than 50% of their waste from landfills. We are interested in moving toward sustainable procurement and approaching a circular economy. https://sustainabilitydashboard.cambridgema.gov/category/waste-reduction

CommonWealth Kitchen

Point of contact: Jen Faigel, CEO, jen@commonwealthkitchen.or, 857-231-1863

CommonWealth Kitchen is a Boston-based nonprofit food business incubator and small business development organization on a mission to build a just, equitable, resilient regional food economy.

To accomplish their mission, they operate a shared-use commercial kitchen that is home to over 50 diverse start-up and emerging food businesses, including food trucks, caterers, bakers, and product companies. They also run a small-batch co-manufacturing social enterprise, providing outsourced processing for emerging packaged food brands, plus custom product development and processing of Massachusetts and New England-grown produce for their own line of products for local colleges, hospitals, K-12 schools, and similar accounts.

CWK owns its 36,000 SF multi-tenant food manufacturing operation, which is located in Boston's Dorchester neighborhood. In addition to their shared-use commercial kitchen and its co-manufacturing operation, CWK's facility is also home to Stone and Skillet, an english muffin manufacturing business and the Boston Public Health Commission's food production job training program.

Problem Statement and Potential Areas of Interest

The very nature of CWK's multi-tenant commercial food manufacturing operation requires heavy use of gas, water, and electricity to run the building, plus numerous delivery vehicles and tons of single use packaging and food waste. While core building systems have been upgraded, there is still a long list of potential opportunities to improve flow, optimize production, lower operating costs, and reduce their environmental footprint. Additionally, CWK has outgrown its current footprint, and is in the early stages of planning a large renovation project to reconfigure and expand their manufacturing operation as they take on additional local food processing for

K-12 schools. Current public school districts served include Boston, Worcester, Springfield, Holyoke, Chicopee, Andover, Reading, Lincoln, Cambridge and Brookline, with more interested in purchasing. Over the next 12 months, CWK will be mapping out a phased renovation plan to expand their co-manufacturing capacity and expand office and meeting space on site. As part of this work, they will be assessing options to add a 2nd story and/or a modest addition, including potentially adding a small cafe/retail space to address food access in the neighborhood.

In order to scale their food production, they will require alternative options for powering larger-scale equipment, such as steam-powered generators and food-grade air compressors. They also want to consider alternative options for addressing cleaning and sanitizing, such as installation of an ionized water system. They would also hope to consider other options to improve operations, lower costs and reduce theirenvironmental footprint, such as:

- Solar hot water
- Cold air recovery for large capacity walk--in fridge and freezer
- Anaerobic digestion of food waste for energy generation (in lieu of compost?)
- Steam vs. gas vs. electric for running commercial kitchen equipment
- Ionized water as an alternative for cleaning/sanitizing
- Battery/solar generator back-up in case of emergency
- Solar generators/batteries for food trucks and push carts
- Improved heating, cooling and ventilation for common areas and offices
- Improved air quality and ventilation in kitchens without impacting food safety
- Rooftop greenhouse/growing and/or light-colored roof to address heat island effect
- Robotics, inventory control systems or other alternates to optimize on-site storage and inventory management
- Alternate automated building access systems to improve site security and lower utility costs
- Alternatives to reduce the use of plastic packaging and/or alternatives to extend shelf life to reduce environmental footprint
- Fryolater grease recycling
- Trash and cardboard compactor(s)
- Porous paving to improve site drainage
- Solar exterior lighting and/or solar structure for food truck batteries

As a nonprofit organization that relies heavily on grant funding, any efforts that can reduce fixed operating costs are a huge benefit. Additionally, any investment that improves

operations and reduces costs also benefits the City and State's long-term investment in their property.

Massachusetts Department of Conservation and Recreation (DCR)

Point of Contact: Ryan Kingston, Decarbonization Program Manager**,** Ryan.C.Kingston@mass.gov, Sarah White, Director of Climate Resilience, Sarah.J.White@mass.gov

Now the ninth largest state park system in the nation, the Massachusetts Department of Conservation and Recreation (DCR) proudly manages 500,000 acres of diverse land consisting of parks, forests, beaches, lakes, ponds, water supply protection lands, playgrounds, swimming pools, skating rinks, trails and parkways. The DCR's mission across all its properties is "To protect, promote and enhance its common wealth of natural, cultural, and recreational resources for the well-being of all."

Problem statement and potential areas of interest:

Executive Order 594 (EO594) directs state agencies to reduce emissions from onsite fossil fuels by 95% by 2050. Goals and targets of this Order includes the conversion to an all-electric fleet by 2050, reduce fuel oil use by 95% by 2030, and deploy 500 EV charging stations at state facilities by 2030. DCR ranks 13th out of 50 state entities in terms of emissions from onsite fossil fuels (Scope 1 emissions), 4th in fuel oil use (~190,000 gallons in FY24), 2nd in fleet size (~800 vehicles), and 1st in overall number of buildings (1,492 structures). As the steward of over 500,000 acres of land, maintainer of hundreds of miles of roadways and trails, and overseer of dozens of recreational facilities including pools and ice rinks, DCR has a significant opportunity to lead the transition away from fossil fuels for heating, transportation, and operational needs.

DCR is interested in exploring innovative technologies that will help its facilities, vehicles, and equipment operate without the need for fossil fuels. These technologies should support DCR's unique needs as a parks and recreation agency, without sacrificing critical areas of operation. A few examples of topic areas, challenges, and potential technologies are listed below.

- **Medium- and heavy-duty vehicles.** About half of DCR's fleet is medium-duty and larger, and includes trucks used for plowing parkways and sidewalks, forest fire response vehicles, garbage trucks, and more. Retrofitting these vehicles to run on alternative

fuels (e.g., biodiesel or renewable diesel) may be of interest, or utilizing new fossil-fuel free equipment for snow management or other needs may be appropriate.

- **Building electrical capacity.** As DCR facilities transition to air-source heat pumps and add EV charging stations, many remote sites, particularly in Central and Western Mass, do not have sufficient electrical capacity. Innovative technologies that support decarbonization on limited electrical capacity could be of interest.
- **Insulation, weatherization, and thermal efficiency.** DCR owns and maintains hundreds of buildings of various typologies, from small office buildings to large maintenance facilities and ice rinks. Many structures are historic, limiting the agency's ability to conduct work on the building exterior, while other buildings lack large enough cavities for standard wall insulation. Concrete block walls, particularly in buildings heated by air-source heat pumps, are also difficult to insulate. Innovative technologies that can improve building envelope tightness and overall efficiency of renewable thermal systems like air-source heat pumps are of interest.
- **Solar.** While DCR has no formal targets for solar PV deployment, the agency is looking to deploy solar rooftops and parking lot canopies where cost effective and appropriate. Due to land use restrictions related to Article 97, DCR must own and maintain these systems, rather than procuring third-party ownership models such as Power Purchase Agreements. The agency would be interested in innovative, low-cost, and modular solar PV systems that can reduce electricity costs, support off-grid applications, and advance the Commonwealth's broader grid decarbonization goals. These might include thin, flexible solar PV systems, walkable and drivable surfaces, off-grid and battery-integrated systems, lightweight systems for any rooftop, and low-profile systems to reduce visual impacts, for example.
- **Road and sidewalk materials.** DCR does not currently have an embodied carbon reduction strategy, but its materials and testing lab has worked to implement sustainable road materials where appropriate. As the steward of hundreds of miles of parking lots, roads, and sidewalks, DCR may be interested in piloting low-carbon or other sustainable road materials as well as materials that help reduce flood risk and/or the urban heat island effect.
- **Landscaping.** DCR's properties are managed by a large fleet of mowers, handheld equipment, and utility vehicles. Parks across the state are transitioning to battery-powered equipment. Various sites may be apt to pilot new equipment for general landscaping needs.

- **Water quality monitoring.** DCR monitors drinking water quality in the Quabbin and Wachusett reservoir and swimming water quality across lakes, ponds, and coastal beaches. Remote monitoring technologies, data management systems, and information-sharing portals may support these efforts.
- **Portable saw mills.** DCR's wood utilization programs work to find the highest and best use for wood products across the state. When trees are removed as hazards or for sustainable forest management, staff rely on portable mills powered by fossil fuels. Staff is interested in exploring clean options, such as those powered by large-capacity batteries or alternative fuels.
- **Snow management.** In addition to equipment needs referenced above for medium- and heavy-duty vehicles, DCR parks are interested in reducing the use of salt and snow melt for snow and ice management. Innovative technologies and materials to support snow management would be of interest.
- **Other Clean Tech/Off Grid solutions.** DCR manages and maintains many buildings and equipment across the Boston Harbor Islands. George's Island is one of the largest fossil fuel consumers in DCR's portfolio in large part because it is off-grid and relies heavily on generators to meet summer power demand. The facility is increasingly moving towards solar PV + battery energy storage solutions, but additional power will be needed to eventually move towards net zero. This location may be a good candidate for innovative technologies like tidal and wave power, micro wind, high density batteries, and other clean energy technologies. Other locations, particularly those in the Berkshires, often lose power in the winter and rely on generators for backup. Clean energy technologies such as multi- day battery storage would be of interest.
- **Peak-shaving.** DCR owns and operates multiple large buildings to support conservation and recreation (such as maintenance buildings, ice rinks). Supply and Transmission Demand charges at DCR facilities can exceed over 50% of the site electric bill. DCR is interested in peak-shaving solutions, including automations and battery energy storage, to reduce electricity costs and grid impact.
- **Geothermal.** DCR is interested in renewable thermal technologies, including ground-source heat pumps. DCR may have locations suitable for this technology, particularly innovative approaches that reduce cost and environmental impact.

Energy New England

Point of Contact: Noel Chambers, CEM, CMVP, CDSM Director, Energy Efficiency and Electrification (508) 698-1233, nchambers@ene.org

Energy New England, LLC (ENE), is a municipal energy cooperative serving approximately 40 Municipal Light Plants and Rural Electric Cooperatives across Connecticut, Massachusetts, Rhode Island, and Vermont. ENE provides a comprehensive suite of services, including wholesale power supply and hedging strategies, distributed energy sources bidding and scheduling, legislative and regulatory advocacy, transportation electrification initiatives, and energy efficiency and conservation programs for both residential and commercial sectors. Its mission is to support municipal utilities and their communities in delivering reliable, cost-effective, and sustainable energy solution.

Problem statement and potential areas of interest:

ENE is committed to advancing the clean energy transition by supporting innovative technologies that address the challenges of energy efficiency, electrification, and grid modernization. One key area of focus is enhancing the ability of municipal utilities to integrate renewable energy sources while maintaining grid reliability and affordability. Many of its municipal utility partners face challenges in managing the variability of renewable generation, and ENE is interested in solutions that optimize grid resilience through energy storage, demand response, and smart grid innovations. Additionally, as electrification accelerates, ENE is seeking technologies that can support widespread adoption of electric heating, transportation, and industrial processes while reducing overall energy consumption and peak demand stress on the grid.

ENE is particularly interested in technologies that facilitate grid modernization, energy efficiency, and decarbonization. Smart grid solutions, such as AI-driven demand response systems, could significantly improve grid flexibility and efficiency by enabling real-time adjustments to energy consumption patterns. Advanced energy storage technologies, including long-duration battery systems and virtual power plants, have the potential to help municipal utilities manage renewable energy intermittency while enhancing reliability. Additionally, as municipalities and businesses look to electrify transportation, ENE is interested in innovations in electric vehicle (EV) charging infrastructure, including vehicle-to-grid (V2G) technology that allows bidirectional energy flow. Other areas of interest include networked geothermal heating, next-generation heat pumps, and AI- powered energy monitoring tools that optimize energy use in residential and commercial buildings.

Global Partners

Point of Contact: James Cater, Senior Director and Sustainability Strategy and Innovation, James.Cater@globalp.com

Based in Waltham, MA, Global has been a leading energy provider in the Northeast for over 75 years. Today, Global owns, controls, or has access to one of the largest terminal networks in New England and New York. Global Partners sources and transports petroleum products and renewable fuels through its vertically integrated, adaptive distribution network across the U.S. and Canada. In addition, Global Partners is a leading wholesale distributor of petroleum products in New England and New York. Through its network, approximately 1M automobile tanks are filled per day. Customers stop at one of its gasoline stations to fill their tanks, recharge their vehicle, enjoy a fresh cup of coffee, or grab a snack.

Problem statement and potential areas of interest:

Based in Waltham, MA, Global Partners LP ("Global") has been fueling the Northeast for over 90 years. As one of the largest integrated owners, suppliers, and operators of liquid energy terminals, fueling locations, and convenience destinations, Global plays a critical role in both the wholesale and retail energy landscape.

Through its expansive terminal network—one of the largest in New England and New York—Global sources and transports petroleum products and renewable fuels across the U.S. and Canada using an integrated, highly reliable supply chain. As a leading wholesale distributor, Global helps fill nearly one million tanks a day, supplying gasoline and diesel to gas stations, commercial fleets, municipalities, and resellers.

At the same time, Global brings energy to life at the retail level where guests can fuel up, recharge, grab a fresh coffee, or pick up a snack—whatever keeps them moving.

Problem statement and potential areas of interest:

1. **Retail**

With a strong retail presence across Massachusetts, Global is focused on creating meaningful guest experiences and supporting the Commonwealth's sustainability efforts. Global Partners is currently exploring how to make specific pieces of their retail portfolio more energy efficient. Upgrading refrigeration, HVAC, and smart lighting systems are typically complex projects that can be costly. Global is interested in innovative solutions that drive operational efficiency and reduce costs. This could include utilizing greenspace or rooftops for solar canopies, green roofs, or other sustainable infrastructure.

Global has also recognized an opportunity to divert landfill bound waste by offering collection bins at its retail locations. With thousands of guests stopping by every day, these sites are well-positioned to serve as accessible drop-off points for non-traditional items, giving these materials a second life. Currently, Global offers textile recycling collection bins at some locations, and is actively exploring similar initiatives.

On a broader scale, Global is interested in solutions that address everyday operational challenges faced by retailers and small format grocers, particularly those that enhance sustainability, efficiency, or guest satisfaction.

2. Low Carbon Fuels

As Global expands its portfolio of low-carbon fuels, they have identified a significant gap in the availability of truly transformative, low-carbon, liquid fuels in the Northeast market. While reduced carbon liquid fuels do exist, there is an increasing demand for liquid fuel products for difficult-to-abate-sector use, with even greater emissions reductions, compared to traditional petroleum-based refined products. The problem is especially acute in gasoline, aviation, power production and maritime fuel markets as these markets are expected to rely on liquid fuels for decades but lack commercially viable alternatives.

Global Partners is seeking new to market, niche, products to help meet emerging regulatory and voluntary requirements. Today, most low-carbon fuel production is geared toward the West Coast, drawn by market incentives and mature infrastructure. The Northeast, by comparison, lacks regional production and supportive tax incentives—despite having feedstock advantages like woody biomass and waterborne logistics. While tax credits such as 45Z do exist, they require the fuel to be domestic, which complicates logistics due to absence of low carbon fuel production in the Northeast that has imported more product than other regions due to its waterborne efficiencies. With the right partners, R&D, and supply chain innovation, Global Partners seeks to shift more production east, taking advantage of local feedstocks, using their infrastructure to support commercialization, improving access to renewable fuels throughout the region.

3. EV Charging

With the need for electric vehicle (EV) charging growing and investment in EV charging infrastructure increasing across its retail footprint, Global is noticing high deployment costs, high utility fees, and longer than usual lead time for essential equipment.

As Massachusetts and other states push for higher adoption rates of zero-emission vehicles (ZEVs), Global is looking to streamline the charger deployment process to create a more commercially viable experience. Reducing the complexity, lead-times, and high cost of the deployment process would allow Global to scale its deployments faster. This will help to expand

access and drive adoption in the market. Once chargers are in place, Global seeks to improve the guest experience, whether that's through site design, services, or integrated technology.

Holyoke Gas and Electric

Point of Contact: Sarah LaRose, Senior Project Engineer, slarose@hged.com, (413) 536-9409

HG&E is a municipal utility serving the businesses and residents of Holyoke, with a mission to provide competitive rates, innovative and sustainable energy solutions, reliable service and excellent customer service. Continued use and expansion of its existing local carbon-free energy infrastructure has been a key component of keeping Holyoke's energy rates low and maintaining reliable electric service. HG&E is always looking for ways to increase and diversify its energy portfolio with renewable energy, energy storage and efficiency/smart grid solutions, as well as interest in collaborating with cleantech vendors to site innovative, cost-effective solutions on its system.

Problem Statement and Potential Areas of Interest

HG&E is particularly interested in being a Project Partner in specific cases exploring the feasibility of deploying innovative technologies within the following areas:

• Clean/Renewable Energy: HG&E would like to expand and diversify its existing portfolio of carbon free and renewable energy resources serving the City of Holyoke.

• Demand Response: HG&E would like to explore options - particularly innovative battery technologies - to shift electric load from high energy use periods to lower energy use periods, thereby improving electric system capacity and reducing HG&E's annual capacity and monthly transmission charges.

• Electric Distribution System Efficiency and Resilience: HG&E is interested in innovative technologies that could reduce electric losses on and improve resilience of/harden its existing Distribution network infrastructure.

• Efficient Building Technologies: HG&E is interested in efficient improvements that could be made to the buildings it owns within the City of Holyoke.

IBEW-NECA of Greater Boston

Point of Contact: Ramsay Stevens, Clean Energy Advisor, ramsay@PDPLatform.com, 561-373-9501

As the organized high-road electrical industry of Greater Boston, its members are critical

linchpins in achieving the equitable clean energy transition its economy and communities need. IBEW-NECA is fully committed to delivering best-in-class training to apprentices and journeyperson electricians and technicians through its world-class Joint Apprenticeship Training Center. In addition, IBEW-NECA provide a top-tier education programs for its signatory contractors, consistently seeking to introduce new technologies and business practices that can drive innovation and improve project delivery.

Problem statement and potential areas of interest:

1. IBEW-NECA needs better solutions for identifying, analyzing, and prioritizing potential clean energy projects to efficiently target business opportunities.
2. IBEW-NECA needs more advanced solutions for streamlining the design, engineering, and construction phases of clean energy projects to enhance competitiveness and reduce overall project timelines and costs.
3. IBEW-NECA needs improved technologies and strategies to support contractors and developers in effectively proposing, marketing, and securing clean energy projects.

IBEW-NECA is currently deploying a range of clean energy technologies and are particularly interested in innovative solutions that improve both the economic viability and ease of developing, designing, and building electrical and energy systems. IBEW-NECA is especially excited by technologies that enhance the underlying economics and performance of electrification projects. Priority areas include integrated electrical and renewable energy systems, smart panels and switchgear, battery energy storage systems (BESS), EV charging infrastructure, microgrid and grid-interactive technologies, advanced lighting and controls, and energy management systems. These innovations align with its core electrical expertise and play a critical role in scaling clean energy infrastructure across its communities.

City of Lynn

Point of Contact: Bill Bochnak, Operations Manager, EDIC/Lynn at wbochnak@ediclynn.org

Lynn is a vibrant, diverse, and strong community of over 100,000 residents. With the expansive Lynn Woods on one side and the Atlantic Ocean on the other, Lynn hosts both suburban-style residential neighborhoods and a bustling downtown near the commuter rail station. Their community includes their residents–both life-long Lynners and New Americans–their independent small businesses and large employers, and the many community-based organizations that call Lynn home. Lynners have a proud history of hard work and strong, supportive communities, as well as a deep tradition of advocating for a better future.

Problem Statement and Potential Areas of Interest

The City of Lynn is open to collaborative partnerships of all kinds, but here are a couple of particular challenges they experience that a climatetech company might be able to help solve:

- The City owns two dozen buildings including schools, the city hall and auditorium, and a historic museum and they are always open to opportunities to make this wide variety of buildings more energy efficient and less dependent on fossil fuels.
- 10% of their residents do not own a car and are dependent on public transportation, biking, or walking. They'd like to improve the experience of using these mobility modes as much as possible.
- The City has a Designated Port Area and underutilized land in their waterfront that is designated for industrial uses, and they'd like to explore how these real estate opportunities could support cleantech broadly, and in particular in ways that might make them more resilient to sea level rise and riverine flooding.
- In the same neighborhood, they are also seeking innovative approaches to restoring the Lynn Harbor Park shoreline, which is their next phase of work as they transform a prior municipal dump into an epic waterfront park.
- The Lynn Woods is a 2,200-acre urban forestry owned by the City and they are open to new forestry management practices that can protect and sustain this natural asset.

Leading Cities

Point of Contact: Michael Lake, CEO and President, m.lake@leadingcities.org | +1 617-506-3499

Leading Cities collaborates with the 287 cities and towns in its Massachusetts network to identify priority climate challenges and match them with climate tech solutions ready to deploy a demonstration project. Host communities must demonstrate both a relevant need and sufficient staff capacity to support project implementation. For demonstration projects that prove successful, but where the host city lacks the resources to scale, Leading Cities has the potential to secure alternative financing to support full-scale deployment—ensuring that impactful solutions can grow beyond the pilot stage.

Headquartered in Boston, Leading Cities is a global nonprofit dedicated to urban sustainability, resilience, and climate action. By fostering partnerships between cities, startups, and industry leaders, Leading Cities bridges the gap between emerging technologies and real-world deployment. As urban areas drive sustainability efforts, Leading Cities empowers cities with scalable, smart solutions through innovation, collaboration, and resilience-focused strategies to shape a more sustainable future.

Problem statement and potential areas of interest:
Municipalities often face barriers such as limited staff capacity, risk aversion, outdated procurement processes, and difficulty identifying trusted, high-impact solutions. Even when motivated to act on climate, cities struggle to evaluate emerging technologies, secure funding, and implement pilots efficiently—especially in small to mid-sized communities. Leading Cities overcomes these challenges and turns companies' innovation breakthroughs into a revenue-generating, cost-saving, community-transforming reality for municipalities across Massachusetts. Whether the company is a seed-stage startup or scaling solution, Leading Cities offers the ability to pilot, validate, and expand climatetech innovation in real communities through: (1) unmatched access to municipal partners, (2) structured support from project ideation to implementation, and (3) a track record of turning great technologies into city-adopted solutions.

- **Deep Municipal Access** – Leading Cities offers direct introductions to 287 cities and towns statewide, from Boston to the Berkshires.
- **End-to-End Guidance** – Through its virtual incubator, LaunchPad 11, Leading Cities provide acceleration, pilot design, procurement support, and PPP coaching so a companies team glides past red tape.
- **Technology-Agnostic, Impact-Focused** – It does not matter whether a startup is hardware or software, Leading Cities focuses only about the measurable values such as revenue for local governments, operational savings, and societal benefits.

Example projects: *(If a technology doesn't fit neatly in one of our boxes, that is not a problem—its city partners relish breakthrough ideas.)*

Municipal Water Treatment Facility Solar Array Upgrade
The municipal water treatment facility is one of the community's two drinking water treatment plants, providing potable water to a year-round population of approximately 32,500, a figure that nearly triples during the summer months. The facility's roof is scheduled for replacement in late 2026, creating an opportunity to upcycle the existing 20-year-old 200-watt solar panels. The municipality seeks to replace the current 16 kW system with a higher-producing 44 kW DC solar array to help offset the facility's significant electricity demand.
Maximizing on-site solar generation at this critical municipal facility would reduce carbon emissions while delivering long-term financial benefits to taxpayers over the useful life of the system, based on standard industry assumptions. However, without grant support, the payback period is projected to exceed 10 years, making the upfront investment challenging for the municipality to absorb.

Municipal Public Works Facility Renewable Energy Deployment
The municipality is interested in solar panel technology that can be deployed at its Department of Public Works facility. This large, open site also hosts the municipal transfer station and is a hub of critical equipment and infrastructure for staff who keep essential functions operating and serve as a first line of support during emergencies. There is significant potential on the site for large-scale solar technology deployment that

could be used to power municipal buildings and even municipal vehicles. The municipality is also open to alternative solar technologies, including tracking systems or other innovative approaches to harness this renewable energy source.

Municipal Public Works Facility Building Efficiency Improvements

At the Department of Public Works site, the municipality is exploring energy-saving measures suitable for large, open spaces such as the garage bays that store heavy-duty vehicles and essential equipment. The building is in the early planning stages of a much-needed renovation, but its emissions will continue to be affected by the energy losses inherent to facilities of this type. Heat-loss minimization technologies—such as air curtains or other innovative efficiency solutions—would significantly reduce emissions and improve daily working conditions for the technicians who keep municipal operations running.

Clean Energy Retrofit Technologies for Municipal Buildings

The municipality has a 25-year decarbonization roadmap that includes replacing or retrofitting HVAC equipment with electric heat pump technology. While advances in both air-source and ground-source heat pumps continue to improve system efficiency and operating costs, the actual retrofit cost—when replacing existing conventional systems at end of life—can be significant. The municipality has a municipal complex where public schools and the town hall have retrofit projects scheduled in the near-term capital plan. As a result, the municipality has strong interest in technologies specifically geared toward low-impact, low-cost retrofit strategies for existing municipal buildings that could be applied to its K–8 school campus, town hall, and similar structures.

Coastal Roadway Resilience and Adaptation Needs

A 1.5-mile coastal roadway within the municipality runs along a south-facing shoreline and contains a mix of public and private beaches. It serves as one of three primary routes connecting key village centers and lies above critical utilities, including a force main, water main, electrical lines, and gas infrastructure. The corridor also supports significant seasonal activity, drawing large numbers of residents and tourists to nearby beaches and serving as part of the route for major community events held each summer.

The roadway's low elevation makes it highly vulnerable to storm overwash and erosion during winter storms. These events frequently result in dune overtopping, with waves transporting sediment onto the roadway and threatening the structural integrity of the road itself. In early 2024, multiple winter storms—considered by coastal scientists to be equivalent to a "5-year storm"—caused significant coastal flooding along this corridor. The urgency of addressing these risks has led the municipality to commission feasibility studies using advanced modeling to assess future damage scenarios and evaluate potential resilience adaptation strategies.

Targeted Coastal Dune Nourishment for Storm Resilience

The municipality is pursuing options for targeted nourishment of coastal dunes along a vulnerable shoreline corridor. Nourishment efforts would help raise the dune crest elevation to better absorb storm impacts and reduce overtopping. The resource areas surrounding this corridor are highly regulated under local, state, and federal law, making targeted nourishment the most viable approach for strengthening the landform's resilience while also supporting protection measures for nearby utilities, including an existing water main. The municipality is seeking grant funding to design and construct the targeted dune nourishment recommended in a feasibility study completed in June 2025.

Integrated IoT Infrastructure Monitoring for Climate Resilience

The municipality's unique position as a coastal community, combined with a large seasonal population influx, amplifies the impacts of climate-driven flooding, drought, groundwater intrusion, and stormwater overload on both new and aging infrastructure. Limited staff capacity, aging building systems, and a reliance on reactive maintenance further hinder the municipality's ability to identify and address issues before they escalate. The municipality also lacks the real-time operational data needed for coordinated emergency response, evidence-based capital planning, and efficient municipal operations. With rising costs and increasing vulnerabilities, the municipality requires integrated IoT monitoring and predictive analytics to manage dispersed assets, strengthen resilience, and modernize essential services.

To address these needs, the municipality proposes deploying a community-wide IoT sensor network to monitor flooding, storm surge, groundwater levels, transportation corridors, building energy use, HVAC performance, indoor air quality, equipment health, and solid waste and recycling operations across key municipal facilities and infrastructure. All sensor data could be integrated into the PHYLL system through the AcceliGOV real-time infrastructure intelligence platform, creating a unified dashboard that supports building management, public works, wastewater operations, waste management, and emergency response. This platform could also leverage future state or federal grant opportunities as they arise. The resulting system would enable early detection of equipment malfunction, energy waste, and climate-related stress on municipal assets, significantly improving operational efficiency, climate resilience, and long-term capital planning across departments, particularly during peak seasonal demand.

Low-Carbon Backup and Flexible Power Solutions for Critical Municipal Facilities

The municipality is interested in exploring more sustainable options for backup and portable power. Currently, most municipal and school buildings equipped with backup systems rely on diesel generators. Given the municipality's climate goals, there is strong interest in identifying cleaner alternatives. While solar and battery backup systems are being deployed where feasible, the municipality is particularly interested in exploring additional technologies.

One critical facility—the community center—is not currently equipped with backup power and has experienced several outages. This facility hosts numerous community programs and events, including services for seniors and residents with disabilities, making power loss a significant resilience concern. The municipality seeks to evaluate low-carbon backup power solutions that could reliably serve the community center. Ideally, the selected technology could also function as a flexible, portable power resource for municipal events or potentially support EV charging.

Municipal Fleet Electrification for Medium- and Heavy-Duty Vehicles

The municipality is actively working to electrify its municipal fleet and has made the most progress with light-duty vehicles, where technology is more advanced and cost differentials are smaller. The municipality is now interested in exploring solutions to reduce emissions from medium- and heavy-duty vehicles. Potential approaches could include retrofitting existing vehicles, piloting a single medium- or heavy-duty electric vehicle, or implementing innovative charging solutions that would expand the municipality's ability to support larger electric vehicles.

Municipal Waste Automation and Reduction Strategies

Waste reduction is a stated priority for the municipality. The municipal Waste Reduction Task Force is pursuing a series of changes to the community's waste collection system to reduce waste and mitigate rising costs. These changes include expanding the existing curbside composting program, transitioning to automated waste collection, implementing a trash-metering or "Hybrid Pay-As-You-Throw" system, expanding reuse options, and establishing fees for bulky-item collection. The municipality is open to exploring solutions that could support the rollout of any of these initiatives or technologies that would improve the ability to track what is ending up in the waste stream and identify additional opportunities to increase diversion away from the incinerator.

Critical Wastewater Pump Station Alarm System Modernization

The municipality operates six wastewater pump stations, each controlled by local pump control panels with remote notifications delivered through a dialer alarm system. The dialer alerts operations staff via voice calls transmitted through traditional telephone circuits wired to each station. The current alarm system has multiple vulnerabilities and has failed to notify operations staff of system malfunctions. In one instance, a pump station experienced a failure that went undetected by the alarm system and was discovered only through routine daily inspections. Any extended delay would have resulted in a severe sewer overflow, causing significant environmental hazards, potential sewage backup into homes and businesses, and discharge into waterways. Such an incident would require immediate public notification and regulatory response.

To improve response capabilities, a custom Programmable Logic Controller (PLC)–based Station Control Panel (SCP) is recommended. Upgrading to a PLC-based SCP alarm system is a critical investment in protecting public health, safeguarding the environment, and

ensuring regulatory compliance. Immediate modernization of the alarm and control systems will significantly reduce the risk of catastrophic sewer overflows and strengthen the municipality's wastewater infrastructure resilience.

Real-World Examples

- **Boston – EV Charging at Speed:** An EV-charging startup that deploys curbside units in under three days per site, creating a new revenue stream for property owners and accelerating Boston's net-zero transportation goals.
- **New Bedford – Smart Parking Optimization:** A data-integration startup consolidating public parking meters and garages into one live app, cutting congestion, increasing downtown foot traffic, and boosting parking revenue.
- **New Bedford and Lowell – Environmental Intelligence for Resilience:** An environmental analytics startup that delivers satellite-driven flood risk assessments and resilience data platforms, equipping city leaders with actionable insights to better prepare for extreme weather events and protect vulnerable infrastructure.

Littleton Electric Light and Water Departments

Point of Contact: David Ketchen, Assistant General Manager, dketchen@lelwd.com, 978-540-2254

With over 113 years of experience successfully managing and maintaining municipal electric systems in Massachusetts, LELWD is exceptionally positioned to be a trusted and competent project partner. LELWD strives to provide reliable, safe, and efficient electric service to the residents and businesses of Littleton and Boxborough. This will always remain the top priority of LELWD and its team's extensive knowledge, commitment to service excellence, and proven track record.

Problem statement and potential areas of interest:

LELWD is committed to managing a power supply portfolio that complies with the Municipal Lighting Plant Greenhouse Gas Emission Standard ("MLP-GGES") (M.G.L. c. 25A, § 11F3/4), while still providing its ratepayers with the lowest possible cost. LELWD also recognizes that reductions in carbon emissions through non-power supply portfolio measures (through enhanced energy efficiency measures, promotion of energy efficient products such as electric vehicles, and rate design) are important contributors to future planning. LELWD will analyze new technologies to achieve the emissions reduction goals and to reduce LELWD's overall power supply expenses.

Technical barriers that LELWD is facing currently include finding the right balance between supply and demand on different distribution circuits throughout its system. LELWD has installed various generation sources throughout the system and to continue to do so LELWD

needs to strategically place new generation within the system that does not cause reverse power back into onto the transmission grid.

LELWD is strategically positioning itself to meet the emissions standards as stated in the Clean Energy and Climate Plan for 2050. While LELWD works towards meeting these goals, LELWD is constantly searching for new ways to decarbonize. LELWD believes that the CriticalMass program provides a way to explore new and improved technologies that can help it meet its decarbonization goals while still providing reliable, safe, and efficient electric service to its customers.

Mass General Bringham

Point of Contact: Dennis Villanueva, Director of Utilities, Energy Strategy & Procurement, dvillanueva@mgb.org, (857) 282-2326

As a healthcare organization committed to sustainability and innovation, Mass General Brigham (MGB) is eager to explore opportunities for decarbonizing its hospital facilities through the adoption of advanced technologies. Its dedication to reducing its carbon footprint aligns with the objectives of the CriticalMass program, and MGB looks forward to the potential collaboration that will help it achieve its environmental and operational goals.

Founded by some of the oldest and most prestigious hospitals in the world, MGB encompasses a range of health care organizations. With two of the world's best known academic medical centers—Massachusetts General Hospital and Brigham and Women's Hospital— its system features renowned specialty hospitals, community hospitals, a leading rehabilitation network, health insurance plan and physician network, a teaching organization and numerous locations for urgent and community care and care at home. The system is comprised of over 23 million square feet of space across close to 700buildings. MGB is the state's largest employer with a workforce of more than 80,000 people across its network of hospitals and academic medical centers.

MGB recognizes that climate change is one of the greatest public health challenges of its time. As an integrated academic healthcare system, MGB is committed to reducing its environmental impact while continuing to provide world-class patient care. Its leadership in decarbonization reflects a deep responsibility to its patients, its communities, and future generations. By prioritizing energy efficiency, clean electricity procurement, and the deployment of new clean energy assets, MGB is setting a new standard for sustainable healthcare operations. you can find more in its Sustainability Impact Report.

Problem statement and potential areas of interest:

The health care sector is responsible for approximately 8.5 percent of carbon emissions in the United States. MGB is committed to reducing its carbon footprint and enhancing energy

efficiency and lowering emissions. When it comes to sustainability, the health care industry faces particular challenges. Unlike most businesses, hospitals are open and operating 24/7, with significant power required to run medical equipment, air handling systems, sterilization processing units, refrigeration facilities, laboratories and complex technology around the clock. Identifying and implementing ways to reduce a hospital's carbon footprint, decrease the amount of waste sent to landfills and adopt environmentally responsible practices demands a collective and coordinated hospital-wide effort. The sector faces challenges such as

- High Upfront Costs: Transitioning to electrified systems—such as replacing gas-powered heating with electric heat pumps or upgrading to energy-efficient electrical grids—requires substantial capital investment.
- Infrastructure Limitations: Many of its legacy facilities rely on aging electrical systems that aren't equipped to handle the increased load from full electrification. Upgrading transformers, wiring, and grid connections to support technologies like electric HVAC systems can be logistically complex and expensive. Building electrification must be developed in tandem with external utility capacity upgrades and grid modernization to be able to handle new grid dynamics.
- Energy Reliability Concerns: Hospitals need uninterrupted power for critical operations. Electrification increases dependence on the grid, and at existing facilities with unreliable electric services or frequent outages, this poses a risk. Backup systems (e.g., diesel generators) undermine decarbonization goals, yet alternatives like battery storage are still costly and less proven at scale.
- Regulatory and Policy Gaps: Inconsistent government incentives, overlapping and conflicting codes, slow permitting processes, or lack of clear standards for healthcare facilities will stall progress. It is difficult to invest without assured long-term support or alignment with changing regulatory policies and incentives

In general, MGB is interested in deploying solutions that have the following characteristics:

To achieve deeper decarbonization, MGB will need to address lowering emissions from thermal systems that operate with fossil fuels. These systems largely satisfy heating and process loads, and often also provide backup and resiliency. MGB is interested in resilient solutions that include fossil fuel free heating equipment such as highly efficient and compact air-source and/or ground-source heat pumps, highly efficient and compact heat recovery systems, including heat recovery chillers and advanced heat exchangers; energy storage systems -electric and thermal, smart microgrid systems, including fuel cells and CHP that can be fed zero or low

carbon fuels, such as hydrogen generated with renewable energy, or as an output from a carbon capture technology, or similar process that results in zero to low carbon hydrogen feed. Additionally, MGB would be interested in advanced micro-turbines that can generate with waste heat streams.

MGB is also interested in solutions to electrify its vehicle fleet and its charging infrastructure. MGB is also interested in technologies or alternatives that reduce the impact of emissions from refrigerants and anesthetic gases.

Climatetech topic areas:

- Solutions that significantly reduce or eliminate carbon emissions
- Solutions that provide heat energy, cooling energy and electricity that displace existing carbon intensive natural gas use
- Solutions that cost less than existing grid-based and on-site alternatives.
- Solutions that meet requirements for reliability and resilience
- Solutions that fit within space constraints of existing urban and sub-urban buildings
- Resilient solutions that include fossil fuel free heating equipment
- Solutions to electrify its vehicle fleet and charging infrastructure.

MassMoCA

Point of Contact: Andy Schlatter, Director of Facilities and Campus Planning (413) 707-4998; aschlatter@massmoca.org

Located in the Western Massachusetts city of North Adams on the premises of a former 19th-century textile mill, the Massachusetts Museum of Contemporary Art (MASS MoCA) was founded in 1999 and is now one of the world's pre-eminent centers for making and experiencing today's most vibrant visual art, music, dance, theater, and film. MASS MoCA catalyzes creative exploration and uncommon connections that amplify the global artistry of our time while contributing to the vibrancy of a region in socioeconomic need.

MASS MoCA's 24-acre campus includes 700,000 square feet of built space within a collection of adaptively reused former mill buildings with an average age of 126 years. Nearly all buildings are constructed of load-bearing masonry exteriors with internal post-and-beam structure; windows are historic wood-frame windows. Renovated between 1997-2017, most buildings are served by a recently upgraded (2021) central heating/cooling plant consisting of gas-fired

boilers and electric chiller and cooling tower. In 2023, MASS MoCA completed a comprehensive Facilities Condition Assessment, providing an indepth look at the state of the existing buildings and site, and is now embarking on a host of projects to address identified issues across all aspects of the facility.

Problem Statement and Potential Areas of Interest

Mass MoCA's 2024-2030 Strategic Plan includes *Accelerate Sustainability* as one of its six primary goals. This goal prioritizes investments and strategies to promote environmentally sound, climate-resilient growth. Such investments include building efficiency improvements, waste stream reduction, landscape-based stormwater management and greening projects, and promotion of regional alternative transportation infrastructure. MASS MoCA has been working with utility partners through the Mass SAVE program to study and implement a range of energy conservation measures: recent and current projects include campus-wide electrical transformer replacements, installation of Variable Frequency Drives on key HVAC equipment, campus-wide HVAC retrocommissioning, thermal envelope air sealing, and more.

Now in its 26th year, MASS MoCA has demonstrated the unique capacity of contemporary art and performance to activate a massive historic factory campus and revitalize a post-industrial rural economy. They are committed to stewarding this unique place and are continually seeking ways to reduce the environmental impact of their operations, while highlighting the dynamic interplay between historical structures and contemporary art. In this context, they are particularly interested in technologies or solutions that have the potential to address one or more of the following goals:

- Reduce the overall energy consumption and carbon footprint of campus buildings while preserving historic architectural character. Viable strategies may include:
    - Building controls that optimize HVAC system management year-round
    - Building envelope improvements that are compatible with historic buildings
    - HVAC equipment or systems that improve efficiency of existing infrastructure
- Identify and incorporate viable alternatives to fossil fuel-based heating in their central plant
- Expand alternative energy generation and/or storage on campus (note that they currently have over 660 kW of solar array on their rooftops)
- Reduce utility costs through strategic electrical load management, storage and/or other techniques

- Electrify their fleet vehicles and landscape maintenance equipment
- Transition to landscape-based sustainable stormwater management systems, including reduction of impervious surfaces on campus
- Improve winter site maintenance regime through materials or equipment that reduce use of fossil fuels and surface-applied melt products
- Transition towards zero-waste operations through waste stream reduction, sustainable materials and fabrication/construction techniques that optimize potential for reuse and/or recycling

MassPort

Point of Contact: Meghan Casey, Project Manager, Real Estate and Asset Management, mcasey@massport.com | 617-568-1092

Massport is an independent public authority dedicated to connecting Massachusetts and New England to the world safely, securely, and efficiently. Massport operates three main business lines that are essential to the region's connectivity and economic vitality. Aviation operations involve the ownership and operation of Boston Logan International Airport, Worcester Regional Airport, and Hanscom Field, collectively accommodating millions of passengers and tons of cargo annually. Maritime operations encompass the Port of Boston, including Conley Container Terminal and Flynn Cruiseport Boston, facilitating international trade and cruise tourism serving Massachusetts and New England. Massport's commercial and maritime real estate development initiatives leverage its properties to support the Port of Boston and economic growth and job creation. These business lines work in synergy to enhance transportation infrastructure, drive economic development, and support the communities they serve.

Massport is deeply invested in climate action and sustainability. The Authority has set an ambitious goal to achieve Net Zero emissions by 2031. This commitment involves improving energy efficiency, transitioning to clean fuel sources, and generating renewable energy. Massport's climate initiatives not only aim to reduce its environmental footprint but also enhance the resilience of its facilities and benefit neighboring communities.

As Massport advances its sustainability and resiliency objectives, the demand for innovative solutions continues to grow. Embracing and nurturing new technologies is essential to addressing the challenges of today and tomorrow. Massport is enthusiastic about responding to MassCEC's Request for Interest for CriticalMass partners, as it presents a valuable opportunity to engage directly with the innovators who will help Massachusetts meet its collective goals.

This collaboration will enable Massport to advance cutting-edge technology, drive progress in its sustainability initiatives, and reinforce its commitment to creating a resilient and environmentally responsible future.

Problem statement and potential areas of interest:

Massport is committed to advancing sustainability and resiliency across its aviation, maritime, and real estate portfolios. Massport has an institutional history of exploring and implementing clean fuels and other pioneering sustainable solutions, and is eager to dive deeper, including in the areas outlined below.

Sustainable ground transportation is one of the first sustainability areas that Massport explored and implemented several projects over the past two decades. Massport has electrified portions of its vehicle fleets, transitioned to renewable diesel fuel, and continues to look for alternatives for specialized equipment that meet operational safety and efficiency needs. Massport is working to tackle issues including converting entire fleets, coordinating with tenants, and developing robust charging infrastructure across assets.

As Massport and its partners renovate and develop the built environment, biomimicry and circular design offer an opportunity to reduce resources over a building's lifetime. A majority of Massport and Massport-tenant buildings are LEED certified, scratching the surface of innovative approaches that integrate circular building materials and sustainable construction practices. How can existing practices combine with biomimicry and nature-based design to enhance the environmental performance and efficiency of Massport's assets?

Carbon sequestration is another technological area in which Massport is seeking an understanding of potential use cases. Massport is interested in biologic and geologic methods to maximize carbon sequestration. Are there opportunities to leverage its access to the watersheet to enhance the ocean absorption potential or recreate wetlands, while using land-side assets to explore emerging technologies like Direct Air Capture?

Massport is also in the process of exploring resiliency strategies for its working waterfront properties. This involves protecting its port terminals and shipyards against sea-level rise and increased storm intensity while maintaining access to the water edge and preserving operational capacity. Massport aims to safeguard its maritime facilities and ensure their continued functionality in the face of environmental changes. In areas where seawalls are required, Massport is considering the integration of technologies like ECOncrete and Living Seawalls to invite sea life to an otherwise uninhabitable surface.

Massport is a member of the Zero Impact Aviation Alliance with MIT and other partners and is committed to increasing the adoption and use of Sustainable Aviation Fuel (SAF). This includes

collaborating with airlines, fuel suppliers, and regulatory bodies to facilitate the transition to more sustainable fuel options. In addition to SAF, how can Massport encourage and support emerging innovation in the aviation sector?

MMWEC

Point of Contact: Zoe Eckert, Sustainable Program and Policy Senior Manager: zeckert@mmwec.org, 413-2181281

The Massachusetts Municipal Wholesale Electric Company (MMWEC) is the Commonwealth of Massachusetts' designated joint action agency for consumer-owned municipal utilities (MLP).

Through its enabling state legislation, Chapter 775 of 1975, MMWEC became a not-for-profit, public corporation and political subdivision of the Commonwealth of Massachusetts. MMWEC's enabling legislation gave it the unique power to issue tax-exempt revenue bonds to finance electric generating facilities and other projects. MMWEC provides a variety of power supply, financial, risk management and other services to the state's 40 consumer-owned, municipal light plants (MLPs).

In this statement of interest, MMWEC proposes that as the Commonwealth of Massachusetts' designated joint action agency for consumer-owned municipal utilities, it is well poised to coordinate with interested Startups and the 40 municipally-owned light plants within Massachusetts to determine product testing and implementation sites and measures.

MMWEC Member MLPs include: Ashburnham Municipal Light Plant; Boylston Municipal Light Department; Chicopee Electric Light; Groton Electric Light Department; Holden Municipal Light Department; Holyoke Gas & Electric; Hull Municipal Light Plant; Ipswich Electric Light Department; Mansfield Municipal Electric Department; Marblehead Municipal Light Department; Paxton Municipal Light Department; Peabody Municipal Light Plant; Princeton Municipal Light Department; Russell Municipal Light Department; Shrewsbury Electric & Cable Operations; South Hadley Electric Light Department; Sterling Municipal Light Department; Templeton Municipal Light & Water Plant; Wakefield Municipal Gas & Light Department; and West Boylston Municipal Light Plant.

Problem statement and potential areas of interest:

MMWEC's municipal utility members are committed to decarbonizing and electrifying their power portfolios, in alignment with the Commonwealth's carbon reduction goals. Approximately half of MMWEC's members have already met the 2030 decarbonization targets of 50% carbon-free energy sales. All of MMWEC's member utilities have power portfolio

"roadmaps" to guide the way to net zero carbon emissions in 2050, including plans for solar, wind and energy storage. MMWEC and its members are committed to addressing environmental justice concerns and improving access to energy efficiency, decarbonization and electrification initiatives for underserved communities, including low- and moderate-income residents, and renters.

In continuing to address MLP decarbonization and electrification goals, MMWEC is, on behalf of interested MLPs, pursuing deployment of the following types or technologies, or finding solutions to the following challenges. This list is in no way comprehensive or prohibitive towards interest and involvement of other technologies and measures.

Energy Efficiency Measures: MMWEC's municipal light plant utility members are interested in technology that addresses the effectiveness of energy efficiency measures in homes in order to best assist residents and commercial spaces in cost-effectively electrifying.

Heat Pump Performance Measures: Due to the lower cost nature of municipal public power rates than that of investor-owned-utility rates, electrification of heating and cooling is incentivized not only up front for MLP ratepayers, but over the full lifetime use of the technology. This makes MLP ratepayers highly incentivized to complete conversions. However, MLPs look to mitigate the impact of heat pump technology in cold climate weather as customers with the currently available technology keep delivered fuel backup heating sources or heating resistance sources that either make decarbonization ineffective or the energy usage of the household too high to be sustainable for the homeowner or the utility during cold periods. MLPs seek more fully commercialized cold climate heat pump technologies.

Battery Technology: MLPs see immense value in the deployment of both residential and large scale batteries as a means to providing continuous renewable power, even when intermittent resources might not be available. In addition, MLPs see the value in battery technologies helping support grid maintenance and strategic upgrades. However, concern remains from many stakeholder groups on the thermal runaway and fire safety of lithium ion battery technology. For this reason, MLPs are interested in pursuing non-lithium and long duration battery technologies.

MRECo

Point of Contact: John Miller, Executive Director, mrecnewengland@gmail.com, 508.728.5825

With 20 years experience in ocean renewable energy (ORE) generation, MRECo is uniquely positioned to provide critical test sites and industry expertise to startups particularly those with technologies addressing energy conversion by tides (TEC) and waves (WEC). MRECo and its

predecessor at the University of Massachusetts, the Marine Renewable Energy Center (MREC), are leaders in the sustainable development of ORE in New England.

Problem statement and potential areas of interest:

MRECo has the only ocean test sites for hydrokinetic energy devices (Wave and tidal) in the Commonwealth and may have the only test stand for tidal energy prototypes in the world. MRECo is willing to assist in any way feasible to support ORE startups.

MRECo already has tidal and wave test sites and wide experience working with startups in wave, tidal, and associated instrumentation, and routinely provides advice to startups in ORE.

MRECo has two ORE sites:

Borne Tidal Test Site (BTTS) – BTTS is a fully permitted test site for tidal energy devices up to three meters in diameter. The fixed platform provides a stable support for both the turbine under test and sensors. The objective system will provide grid connection and broadband instrumentation connectivity. A support arm provides the ability to raise and lower a turbine, and power a power load for turbine testing and electrical power of sensors is provided. In addition, three sensor categories are available:

1. Power Curve Determination – The BTTS provides monitoring of water velocity and power output to allow determination of the power curve a device under test.
2. Environmental Monitoring -Video surveillance of the turbine and acoustic imaging of the turbine test aperture documents any potential approaches or other behavior by marine animals near the turbine under test. Surveys are made of birds, particularly diving species.
3. Other Sensors – BTTS can flexibly accommodate other sensors that might be desired by the testing company for turbine parameters like rpms, thermal characteristics, etc.

Cuttyhunk Wave Test Area (CWT) – The CTW provides a partially permitted test area for wave conversion devices. Fully permitting requires definition of the anchoring or other bottom mounted structures, and MRECo has the experience to facilitate the completion of these permitting requirements. The site provides power and grid connection with the micro-grid on Cutthyhunk Island. MRECo has characterized the wave climate and continues to gather additional information for a DOE funded wave device test in 2026.

Industry Support – The MRECo staff has broad experience in the hydrokinetic (Tidal and wave) industry as well and product development and commercialization, start-up business planning and fund raising.

Permitting – MRECo has unrivaled experience in permitting and licensing tidal and wave projects and for both testing and commercialization of deployment sites.

Museum of Science

Point of Contact: **Robert Behrent, Director, Facilities, Museum of Science,** rbehrent@mos.org, 617-589-0151

The Museum of Science inspires a lifelong love of science in everyone. The Museum has been changing lives through science and curiosity for nearly 200 years – longer than almost anyone else in the country. Today, it is one of the world's largest science centers and New England's most highly attended cultural institution, reaching more than 1.5 million people annually at Science Park and over 260 million more in classrooms and online around the world inspiring the public with the power of science to help them understand the world, solve problems, and create bright futures for everyone

Problem Statement and Potential Areas of Interest

The Museum is interested in technologies related to:

- **Energy & Electricity** - increasing renewable energy generation onsite
- **Buildings-** improving energy and heating efficiency, transitioning to renewable sources, and implementing sustainable construction practices/materials
- **Resilience and Adaptation** - implementing climate-smart planning, strengthening infrastructure, and promoting nature-based solutions to reduce vulnerability to climate change

Specifically, the following technologies reflect the Museum's commitment to innovative, practical, and replicable solutions that have the potential to deliver meaningful energy savings, lower operating costs, and provide real-world demonstrations for startups, industry partners, and the broader community.

- **Exhaust Flow Technology (EFT) for Air-Source Heat Pumps (ASHPs)**

  The Museum of Science's ASHP system is designed primarily for heating, but efficiency can be significantly improved during Boston's cold winters by integrating exhaust air and steam condensate recovery. EFT captures warmer exhaust air from nearby air handling units and exhaust fans, passing it over coils tied to available steam condensate improving heat pump efficiency, reducing electric load, and potentially eliminating the need for additional steam heating.

- **Ground-Source Heat Pumps**

  The Museum is exploring the feasibility of geothermal systems to provide efficient, low carbon heating and cooling across the campus.

- **Kinetic Energy Capture**

  The Museum is investigating the potential to harvest energy from walkways, turnstiles, and exhibits to offset electrical loads.

- **Expanded Solar Technologies**

  The Museum is continuing to evaluate roof-mounted and building-integrated solar systems, including walls and other architectural surfaces, to maximize on-site renewable energy generation.

- **Building Optimization Strategies**

  The Museum is implementing advanced heating/cooling valve controls, pressure differential management, and other building optimization measures to reduce energy consumption and enhance system performance.

- **Artificial Intelligence (AI) for Program Optimization**

  The Museum is leveraging AI and machine learning to optimize building systems, programmatic energy use, and operational scheduling for maximum efficiency and carbon reduction.

National Grid Partners

Point of Contact: Sander Cohan, Head – Innovation Lab, sander.cohan@nationalgrid.com

Problem Statement and Potential Areas of Interest:

Grid Edge Resiliency and Capacity

National Grid is actively seeking advanced, scalable solutions to mitigate grid impacts caused by the accelerating adoption of distributed energy resources, including electric vehicles. A pressing challenge is the strain on low-voltage distribution infrastructure—particularly in residential and small commercial sectors.

Key barriers include:

- Panel capacity limitations in legacy buildings that cannot support 240V chargers without costly upgrades.

- Local transformer overload risk due to the clustering effect of EV adoption in neighborhoods.
- Peak load amplification, especially during evening hours when EV charging and residential demand overlap.

Areas of interest include solutions that:

- Eliminates the need for electrical panel upgrades.
- Performs intelligent peak shaving to smooth grid demand during charging events.
- Supports grid flexibility goals through behind-the-meter energy storage and load shifting.

Infrastructure Resiliency

National Grid is actively seeking advanced, scalable solutions to reduce the total installed cost of undergrounding electric and gas distribution assets. The transition to underground infrastructure is critical for resilience, climate adaptation, and long-term cost efficiency but civil construction remains the largest cost driver.

Current barriers include:

- High first costs driven by manual excavation, trenching, and restoration work.
- Limited visibility into subsurface conditions, leading to overruns and change orders.
- Fragmented data and planning tools that slow project scoping and permitting.
- Reactive O&M models that rely on excavation and manual inspection for fault detection.

Areas of interest include solutions that:

- Reduce excavation and restoration costs through robotic, trenchless, or automated civil construction methods.
- Improve planning accuracy with advanced and easily integrated subsurface mapping, sensing, and geospatial intelligence.
- Extend asset life via corrosion prevention, smart materials, or embedded sensing.
- Enable predictive maintenance and remote condition monitoring to reduce lifecycle O&M costs.

Flexible Capacity & Load Relief

National Grid is actively seeking advanced, scalable solutions to deliver flexible capacity and load relief at lower cost and with faster deployment. As electrification accelerates and peak demand grows, utilities need agile approaches to manage localized constraints in addition to traditional infrastructure upgrades.

Current Barriers

- High mobilization and interconnection costs for temporary or mobile capacity assets.
- Limited real-time visibility into feeder-level constraints and hosting capacity, making it hard to target relief where it's most needed.
- Slow planning cycles due to fragmented forecasting tools and lack of integrated grid analytics.
- Operational uncertainty around seasonal or short-term assets, including logistics, siting, and compliance.

Areas of Interest

- Rapid-deployment capacity solutions such as modular storage, mobile generation, or hybrid systems that can be installed and energized in days, not months.
- Real-time sensing and control platforms for dynamic dispatch and optimization of distributed resources.
- Predictive maintenance and lifecycle management for mobile or temporary assets to reduce downtime and cost.
- Novel integrated non-wires alternatives (NWAs) combining storage, flexible generation, and demand-side flexibility for peak shaving and emergency relief.
- Innovative business models (leasing, shared assets, pay-for-performance) to reduce upfront capital burden and accelerate adoption.

Olin College

Point of Contact: Claire Rogers, Program Manager, LivingLabPartnerships@olin.edu, 203-885-9850

Founded in 1997 to change undergraduate engineering education, Olin teaches students to be explorers, experimenters, and creators who design their own path forward.

Currently Olin College is working on transforming engineering education toward a world in which engineering serves everyone. Olin will provide students with meaningful impact-centered learning experiences that will develop engineers who are inclined to serve society and the planet, solve problems by understanding people's needs, and appreciate and understand perspectives other than their own. Focused on human and planetary health, Olin's College as a Living Lab (CaLL) will achieve the Engineering for Everyone vision through novel and

transformative: 1) design, development, and delivery of impact-centered education, 2) pathways and access to engineering education, 3) public-private-people partnerships of companies, public agencies, universities, institutes, communities, and individuals, and 4) convening of discussions and dissemination of learnings about the technical, social, and temporal dimensions of the sustainable solutions it investigates. This initiative positions Olin as an experimental testbed for reinvention and sustainability, and for transformation within and outside Olin.

The initial foci of Olin's CaLL strategy are 1) achieving net zero emissions by 2029, 2) integrating college operations and curriculum to create meaningful, impact-centered learning opportunities for students, faculty and staff, 3) developing students' identities as collaborators for change by practicing relational models of human-centered design and deepening and centering sustainability in the curriculum, 4) working towards equity, access, and inclusion by dismantling systemic barriers and creating new pathways for all to feel a sense of belonging, and 5) proposing new, bold, and innovative approaches to engineering education.

Problem statement and potential areas of interest:

The engineering and operations team is continuously looking for products and technologies that:

- Reduce energy usage
- Reduce GHG emissions
- Increase preventative maintenance and reduce unplanned maintenance
- Increase on-campus renewable energy
- Help to manage the campus energy and demand profile
- Improve comfort and air quality
- Improve campus sustainability (energy, waste, water, new construction, materials)

Some of the specific technologies Olin College would like to explore are:

- Window film/treatment to reduce solar gain for comfort and perhaps to produce energy
- Machine learning/AI that optimizes how buildings perform
- Solutions for domestic hot water heating – heat pumps, solar thermal, etc.
- Geoexchange technology – drilling, piping, heat pumps, system design
- Heat recovery technologies for space heating and cooling
- Sustainable pavement that prevents ice buildup
- Waste management - compost, recycling, trash
- Energy storage and peak demand management strategies
- Sustainable construction materials and buildings

- Renewable energy
- Microgrid strategies, systems, or controls
- LED lighting and controls
- Electric fleet vehicles and charging stations
- Sustainable landscaping, fertilizer, irrigation
- Campus food production, indoors or outdoors
- Platforms that facilitate sustainable procurement

Saint-Gobain

Point of Contact: Daphne de La Grandiere, External Venturing Project Manager, daphne.delagrandiere@saint-gobain.com

As the global population grows, Massachusetts' manufacturing sector faces heightened pressure to meet material demands while minimizing environmental pollution and reducing carbon emissions. Manufacturers have historically relied on the traditional linear model—extracting, using, and discarding materials—which contributes to waste and leads to intensive Scope 3 carbon emissions from raw material extraction and manufacturing. Transitioning to a circular economy—where materials are reused, recycled, repurposed, remanufactured, and redesigned—offers substantial opportunities to decarbonize material supply chains, enhance supply chain resilience, reduce landfill pollution, and unlock new economic and job opportunities.

Problem statement and potential areas of interest:

With operations in >70 countries, including >150 sites in North America alone, Saint-Gobain manufactures materials that go into almost every industry, including medical, automotive and construction markets. In Massachusetts, Saint-Gobain maintains 2 advanced R&D centers and 8 manufacturing plants producing materials such as roofing shingles & granules, silicone tubing, abrasive sandpaper, and ceramic products. Moving to a circular economy is a key pillar to decarbonizing Saint-Gobain's operations; however, many of Saint-Gobain's materials are notoriously difficult to circularize and limiting the state's ability to recover value from these materials. As an example, according to the Environmental Protection Agency, the majority of the 11 million tons of asphalt shingle scrap generated per year in North America goes to landfill.1 As such, Saint-Gobain seeks to support growth-stage companies to pilot solutions that tackle key challenges in material circularization:

- **Recovery of high-value materials from composite materials:** Most Saint-Gobain's materials are composites specifically designed for performance, durability and

resistance toward wear and tear. Composite scrap generated at Saint-Gobain manufacturing sites or downstream customers (such as silicone tubing for medical applications, abrasive sandpaper, glassmat and roofing materials) often challenge conventional recovery via mechanical milling and recycling due to their durable and/or flexible nature. Other technologies for retrieving valuable components from these materials, such as pyrolysis, have limitations such as high energy requirements, incomplete decomposition, unpredictable end output quality, potential environmental concerns, and challenges with scalability and cost. Moreover, with increasing extreme weather, durable composite materials will be increasingly desired to adapt to rising temperatures and other climate change impacts. Saint-Gobain seeks modular, cost-effective technologies that would be versatile enough to tackle waste streams in Saint-Gobain's Massachusetts plants, while being more sustainable and more energy-efficient than competing options.

- **Valorizing composite waste materials into new products:** Besides recovering high value components from composite waste streams, waste streams may also be transformed into new classes of products. This may be through mechanical or chemical treatments, novel forming technologies (e.g. 3D printing or hot press) or designs, and may involve a sequence of pretreatment or post-treatment technologies (e.g. milling, etc) to enable sorting, size reduction and/or adequate separation. Toward this end, SaintGobain seeks solutions that could have the ability to accept large quantities of waste relevant to Saint-Gobain plants in Massachusetts (such as silicone tubing, glassmat, abrasives waste), have a path toward economic viability, and a target customer market to test within this program.

Saint-Gobain is well-positioned to collaborate with the Massachusetts Clean Energy Center (MassCEC) and support growth stage startups – not only due to its manufacturing presence in the state, R&D expertise and facilities, and local and global leadership in sustainability and circular economy – but also its experience guiding maturing startups. Saint-Gobain's interactions with startups are facilitated by NOVA, the external venturing arm of Saint-Gobain, which has historically sponsored partnerships and accelerators with positive outcomes. In Massachusetts, NOVA is well embedded into the start-up ecosystem through strong collaborations with Greentown Labs in Somerville, MA.

For the demonstration pilot, Saint-Gobain envisions securing waste materials from manufacturing plants and/or customers in the region and piloting disruptive recovery/valorization technologies at a facility in Massachusetts – either at Saint-Gobain Research North America, or at a neighboring academic partner facility. If critical to the success of the project, Saint-Gobain may also consider deployment of the technology at one

of Saint-Gobain's manufacturing sites. Since Saint-Gobain's 8 Massachusetts sites produce materials that serve almost every market sector, scaling up circularity technologies through this program would validate opportunities for Saint-Gobain to partner with customers, suppliers, and other stakeholders in MA to recover value from challenging post-industrial and postconsumer composite materials. This would further promote decarbonization of manufacturing and deliver compounded economic and sustainability benefits across the region.

Shrewsbury Electric and Cable Operations

Point of Contact: Patrick Collins, Integrated Resources Analyst, pcollins@shrewsburyma.gov, 508- 841- 8313

As a public electric utility, SELCO is a small but mighty organization that has progressive strategic goals that include 100% non-carbon power supply by 2032 and supporting the community of Shrewsbury in decarbonizing and electrifying.

Problem statement and potential areas of interest:

Energy storage will be an essential grid technology moving forward, as its power supply transitions to more intermittent renewable resources. Adoption of energy storage in Shrewsbury remains very low, both for behind the meter customer applications and utility-scale, mainly due to its high upfront cost. SELCO's reliability also makes the need for backup power very rare.

SELCO is interested in increasing the adoption of energy storage, preferably non-lithium based technology, for customers that can participate in demand response or virtual power plant programs, as well as utility-scale application for emissions free peak shaving.

SELCO is also interested in vehicle to X/grid technology.

The theme with these interests is enhancing the dynamic interaction between a customer and the grid, to mitigate peak demand as electrification increases. SELCO is interested in solutions that meet this goal.

The TRUE Collective

Point of Contact: Tanya Lobo, Executive Director, Tanya@thetruecollective.org, Tanya@thetruecollective.org

Its goal is to build a thriving community center that offers space and resources for personal, skill and career development and opportunities for community trust-building, organizing, and collaboration in a facility that serves as an exemplary clean energy community resilience hub (CCRH) through a process that embodies innovation, inclusion, diversity, equity and intensive community engagement.

Problem statement and potential areas of interest:

The TRUE Collective is developing a Clean Energy Community Hub and satellite climate tech training space for the Whittendon neighborhood of Taunton, and are facing the following challenges:

- Insufficient capacity and/or antiquated switchgear (5kV) serving LIDAC neighborhoods of the City.
- Space and challenges of getting an appropriately sized BES system approved by fire and town to support resilience requirements.
- Emission free transportation of disadvantaged youth to the facility
- EV Charging availability and reliable charging
- Insufficient clean and resilient energy job opportunities available for Taunton LIDAC community

Technologies that the TRUE Collective is interested in deploying:

- Energy Storage (Battery and Thermal)
- Electric Busses
- Microgrid
- V2G (Vehicle to Grid) Charging
- Solar
- Demand management (VPP)

University of Massachusetts Boston

Point of Contact: Dr. Shubhro Sen, Executive Director, Venture Development Center, Assistant Vice Provost for Research and Strategic Initiatives, Shubhro.Sen@umb.edu, 617-888-0457 & Dennis Swinford, Director of Campus Planning and Sustainability, Dennis.Swinford@umb.edu, 617-287-5402, Janna Cohen-Rosenthal, Janna.CohenRosenthal@umb.edu, Sustainability & Resiliency Planner

UMB is an urban public research university with a commitment to environmental stewardship on campus, and sustainability research and education. It has a strong School for the Environment and leading climate and energy researchers on campus, as well as an Environmental Analytics core facility. It has published an Energy and Carbon Master Plan/.

The goal of this plan is to provide a pathway that gets UMass Boston to net-zero and to a more resilient campus by 2050 by: a) Reducing energy consumption and enhancing resiliency in existing buildings; b) Building energy efficient and resilient new buildings; c) Switching fuel sources by electrifying the Central Utilities Plant and expanding sea-water heat pumps; and d)Utilizing renewable energy, on and offsite. The timeline for implementing the plan has been sped up as was published, and currently efforts are underway to decarbonize the central utilities plant by expanding the Saltwater Pumphouse cooling and heating capacity.

Since 2009, the VDC at UMass Boston has been an engine for economic growth in the state, supporting over 200 advanced technology, life sciences and climate-tech startups, which have collectively raised over $2.5 billion in funding and created 3,000+ high-paying jobs in Massachusetts. Additionally, the VDC has trained hundreds of interns, many of whom have pursued successful careers in the region. The VDC currently has 4 resident companies in the areas of energy efficiency, carbon sequestration, sustainable bio-materials and recently graduated a sustainable marine fuel company. The VDC is very experienced and well positioned to support any start-up[s] selected to partner with UMB by Mass CEC.

Problem statement and potential areas of interest:

The UMB campus is currently comprised of 13 buildings totaling 1,751,900 square feet. The Overarching challenges as identified in its Master Plan:

- Buildings are currently provided with hot and chilled water from a central plant powered by burning natural gas. Major equipment at the central plant will need replacement within the next 5-10 years including a 33% capacity increase to meet anticipated growth by 2050. There is both key opportunity to electrify the central plant and avoid burning more fossil fuels on campus, as is also required by Leading by Example state executive orders.
- A collection of older buildings referred to as the Heritage Buildings will require major renovations. This is a key opportunity for projects to reduce loads imposed on the central plant, improve building energy efficiency, install occupancy sensors / building controls and transition to low temperature hot water systems.
- There are operational issues, low-cost energy conservation measures, and deep energy retrofit opportunities that were identified during the plan development. These are key opportunities to reduce thermal loads imposed on the central plant, improve building energy efficiency, and install renewable energy technology. UMass Boston bring these opportunities to its general attention given the range of potential solutions Mass CEC has in its portfolio of companies.

The following are areas of interest:

- The Campus Center and University Hall buildings present an opportunity to be very productive for Building Integrated Photo Voltaic [BIPV] solutions due to their location. UMB can potentially replace large areas of sun facing glass panels with transparent solar panels/BIPV technologies. This would allow UMB to retain ocean views but enable both energy efficiency and energy generation. UMB also has long glass panels with similar potential in its heritage, Wheatley building, 2nd and 3rd floors. One other benefit of this project will be to allow UMB overall to have more PV installed since its roofs will be at capacity after upcoming projects estimated at 2 MW in design phase are completed.
- UMB is looking for a non-polluting insulation coating material [not poisonous or dangerous to humans] to improve the entire building's energy efficiency. UMB has committed in its S&R plan to increase the performance of the building envelope. This translates into better insulation of walls, performance of windows and roof. It would be very interesting to implement vanguard new solutions to increase the performance of the building façade. Additionally, if UMB could find ways do these upgrades incrementally, it would be significant. Currently, whole floors or even whole buildings have to close during performance improvements. This is inconvenient and expensive.
- Occupancy sensors to help it manage the buildings better, and the ability to provide real-time data would be of great interest. UMB wishes to pursue an integrated energy performance platform for the entire campus and manage building energy consumption in a dynamic responsive way to also improve occupant comfort and provide potential energy use data, for student and faculty research projects. Its current systems do not allow this level of data sharing.

University of Massachusetts Lowell (UML) Rist Institute for Sustainability & Energy (Rist Institute) and Innovation Hub (iHub)

Point of Contact: Mary Ann Picard, MBA,MS, Executive Director of Innovation, Maryann_picard@uml.edu, (978)934-3403 & Ruairi O'Mahony, Senior Exec Director, Rist Institute, Ruairi_omahony@uml.edu, (978)934-1866

The Rist Institute brings together the university's extensive R1 research enterprise, more than 12 core research and testing labs available to external users, more than 30 industry partners, and more than 85 entrepreneurial faculty members and its dedicated students to develop new clean energy and other sustainability solutions.

The iHub is an 11,000-square-foot sustainability-focused incubator/accelerator dedicated to advancing startups from anywhere who are developing climate tech, cleantech, energy, sustainable chemistry, other environmental and other sustainability-related innovations. The iHub works with Massachusetts startups and works to attract startups to Massachusetts and through the provision of a whole host of resources, including subject matter expertise, ongoing programming and a prototyping lab and access to a shared wet lab with over 100 pieces of shared equipment, helps to advance these technologies toward market launch.

Problem statement and potential areas of interest:

Among the areas that are of particular interest to the Rist Institute and iHub are climate change mitigation and resilience, renewable energy, energy storage and transition, hydrogen - production, storage, transport or application, energy storage & transition (heat, electricity), batteries - next gen, recycling & circular economy, clean chemistry innovation, and urban agriculture. Technologies within the organization that are of interest for deployment:

- Wind turbine blades - the use of drones, computer vision and artificial intelligence to detect damage in wind turbine blades which has the potential to revolutionize the way structural health monitoring of turbine blades is performed. The blades, which are made of fiberglass and epoxy resins, can measure hundreds of feet in length and weigh several tons. During normal operation, stress/strain on the blades can lead to cracks and other structural damage, causing the turbine to fail and disrupt power generation. Novel innovations for regular blade inspection and monitoring are needed to maintain reliability and safety.
- Advanced drone usage - the use of drones to monitor the structural integrity of buildings, bridges and roads. As it relates to the structural integrity of buildings, one piece of the puzzle that experts are focused on is building energy efficiency to reduce the carbon footprint and to have a ‘greener’ built environment. To take it a step further, UMass Lowell experts have taken their work and technology a step further by using the scans developed to create more detailed, improved renderings of buildings (photogrammetry) that can be broadly deployed for many use cases.
- Climate change mitigation and resilience - UML is actively involved in both climate change mitigation and resilience deployment projects, collaborating with the city of Lowell and other organizations to create resilient and sustainable cities. This includes working on reducing carbon emissions, transitioning to renewable energy, and building community resilience to extreme weather events.
- Renewable energy – UML’s Center for Renewable Energy is working on significant expansion of offshore wind energy deployment within the U.S.

- Energy storage and transition - UML is actively involved in energy storage and transition deployment, focusing on advancing clean energy technologies and supporting the state's energy transition goals. Various aspects of energy storage are involved, including battery technology, hydrogen production, and grid integration, with a strong emphasis on equitable and sustainable solutions.
- Hydrogen – production, storage, transport – UML has been involved in several hydrogen production and storage deployment projects, showcasing various approaches to clean energy storage and use. These have included renewable energy capture, hydrogen production via electrolysis, and long-term storage innovations. UML has also focused on using landfill gas or wastewater to produce hydrogen.
- Batteries - among others, UML has engaged in deployment projects that showcase the growing role of battery energy storage systems (BESS) in grid stability and renewable energy integration.
- Urban agriculture – UML has several urban agriculture deployment projects, including the Rist Urban Agriculture Greenhouse and Farm, rooftop gardens, and community gardens. These projects focus on local food security, sustainability, and community engagement.

WHOI

Point of Contact: Leslie-Ann McGee, Chief Innovation Officer, lmcgee@whoi.edu, Anthony Kirincich, Associate Scientist, akirincich@whoi.edu

The Woods Hole Oceanographic Institution (WHOI) is dedicated to advancing knowledge of the ocean and its connection with the Earth system through a sustained commitment to excellence in science, engineering, and education, and to the application of this knowledge to problems facing society. In its everyday work as scientists and engineers, WHOI pushes the boundaries of exploration and observation across the globe to carry out both basic and applied science research. Founded in 1930, WHOI pursues advancements in technology and advancements in science hand in hand, from sea-going field deployments of innovative mooring systems, to robust autonomous ocean systems that carry out complex tasks, to ocean energy system development to further research goals requiring remote, sustained power sources.

Problem statement and potential areas of interest:

As an institution, WHOI strives to lead innovation in ocean and climate technology and have developed unrivaled Access to the Sea and Equipment and Instrument Test Facilities to bring new methods and technologies from the drawing board to routine scientific use. Transitioning WHOI technologies outside of the institution to serve society has been a long-term focus for

WHOI, which they seek to continue through a potential role as a project partner to the MassCEC's CriticalMass Program.

WHOI seeks to support Massachusetts' Climatetech goals by working as a potential project partner within the Clean Energy Center's CriticalMass program. Growth areas within the startup landscape across the Commonwealth that could benefit from WHOI engagement and potential effort include: Work on sensor validation and testing for climate, carbon, and energy transitions within the ocean space. Work that requires ocean testing or validation at permitted 'ocean test sites'. Work on parameter sensing via non-destructive sampling (i.e. 'lab on a chip', remote electromagnetic active or passive sampling, acoustic communications and sensing). Work on autonomous vehicle design, operational configurations, enclosure and/or housing research, behavior programming, and transitions to market. Finally, energy is an order one issue within oceanographic systems and critical to scientific progress, making energy efficiency and energy focused designs a key area of focus for WHOI's long-term mission and growth.

Interactions between WHOI and startups in the Commonwealth on these transformative issues could enable synergistic growth of experience and knowledge, successive launches of small firms, and a dramatic growth of both training opportunities for high tech workers and long-term high-tech jobs within the local climatetech community.

WHOI has numerous facilities, technical resources, and human resources that could be employed to help CriticalMass programs/projects achieve their start up goals. Several of the major facilities are highlighted here briefly:

Iselin Marine Facility: The WHOI pier at the Iselin Marine Facility has two principal berths, one 430 feet long and the second 256 feet long. Both can accept vessels with drafts equal to the 19-foot limit imposed by the approach channel to the harbor. Potable water, fuel and provisions are available, as are numerous small boat facilities, on dock ocean test wells, cranes, lifts, and machine shop services.

Institution test tanks and pressure test facilities: WHOI runs numerous test wells, pools, and pressure test facilities capable of simulating up to full ocean depth pressures for testing of housing, connectors, and sensor systems.

Instrument housing design, fabrication, and assembly: A component of its support for ocean-going research objectives, WHOI shops and labs have the ability to locally design, fabricate, and assemble world leading components from locally sources materials and expertise.

Maker Space and Project Support: WHOI's Autonomous Vehicles and Sensor Technologies (AVAST) center is a new initiative to accelerate innovation and improve collisions in ocean research, design, and education. AVAST provides a framework of training, materials, and

resources to support research and engineering programs that are difficult to do with existing infrastructure. Part of this framework is the AVAST Innovation Hub, which is a physical space to foster research collisions and technical collaborations. Although AVAST takes its name from "Autonomous Vehicle and Sensor Technologies", these embrace only part of the spectrum of new projects and programs that AVAST supports at WHOI.

Open Ocean Test Facilities: WHOI's Martha's Vineyard Coastal Observatory (MVCO) and the Air-Sea Interaction Tower (ASIT) are both a plug and a platform in the ocean to support basic and applied research, instrument testing, and sensor validation. Created in 2001, MVCO has hosted critical experiments on the coupled air-sea boundary layer, underwater noise, autonomous underwater vehicle testing and development, and atmospheric research. Central to the MVCO, the ASIT is a cabled, fixed platform located approximately 3 km south of Martha's Vineyard in 17 m of water. An upgrade to the power and communications systems in 2019 provides up to 5 kW of power and enhanced data. Transfer speeds to support testing and validation of new atmospheric and oceanographic sensors. At the ASIT, WHOI has been maintaining the MetOcean Reference Site (MORS-1) since 2016. MORS-1 provides both publicly available reference datasets of wind energy specific metocean observations as well as a pre-permitted Lidar buoy validation location that has been used since 2019 to validate buoy systems for energy production data collection.

Oceanographic buoy and mooring systems: Multiple shops on campus are capable of designing, fabricating, deploying, and recovering buoy and mooring systems for both testing sensors as well as long term monitoring of the ocean and climate. These groups work with numerous investigators at WHOI and external and would be primed to work with additional stakeholders from the CriticalMass program.

Ocean and Climate Innovation Accelerator (OCIA) is a unique consortium generating new knowledge and accelerating climate solutions by focusing on the ocean and leveraging the strengths of academic research and commercial development. OCIA was launched in 2021 by Woods Hole Oceanographic Institution (WHOI) and Analog Devices, Inc. (ADI), through its shared recognition of the urgent need to understand fundamental ocean processes to predict future climate impact and to inform policies to address it. OCIA is intentionally designed to bring together organizations across sectors and areas of expertise to drive collective action and meaningful, scalable change.

Interested startups will need to include WHOI in the scope and budget on the full proposal as a subcontractor. Details on this will be worked through at the initial meeting.

XYZER

Point of Contact: Ali Barooee, PE, Founding Principal and Subject Matter Expert, abarooee@xyzereng.com

XYZER specializes in engineering solutions, from conceptual and detail design to construction support, for underground and submarine power transmission systems, supporting the expansion and modernization of the grid to meet the growing demand for renewable energy in the Northeastern U.S. Leveraging deep technical expertise, commercial insight, and hands-on experience from multiple transmission and cable projects, they deliver cost-effective, reliable, and constructible solutions tailored to each project's unique challenges.

Founded in Massachusetts in 2023, XYZER was established to address a critical bottleneck in the clean energy transition, the engineering of high-voltage grid interconnections for renewable energy and storage projects. Their mission is to make these essential connections accessible and affordable, particularly for emerging developers and startups seeking to advance clean energy deployment.

XYZER is interested in working with startups on proposals. Depending on the technology and its alignment with project needs, XYZER will engage its clients to support the implementation and demonstration of the technology within actual projects where feasible.

XYZER is open to offering further support such as:

• Where possible, inviting startup teams to participate in project coordination and design review meetings to gain practical industry perspective.

• Providing structured feedback on prototype or field test results.

• Sharing lessons learned from prior projects to help startups align product development with market needs.

• Exploring partnership pathways where validated technologies can become part of XYZER's service offerings to clients. Through these contributions, XYZER aims to create a bridge between innovative startups and the operational realities of underground transmission and renewable interconnection projects, accelerating the deployment of technologies that advance the clean energy transition.

Attachment A: Sample concept paper response template

Company Overview

Company Name and Address:
Lead Applicant Name:
Lead Applicant Contact Info:
Employee Count:
Funds Raised to Date:

Technology Overview:

"Project Title"

Pain point:
1-2 sentences describing the Project Partner's pain point or challenge that you are proposing to solve

Technology Description:
1-5 sentences describing the technology at a high-level and the current status of the technology (including TRL, active partnerships, etc.)

How the Technology Works:
1-4 sentences describing technology details
Innovation and Benefits:

- 1-5 bullet points listing out the innovation aspects and benefits of the technology

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Proposed Project Details

Proposed Project Location (if known):

Proposed Project Description:

1-3 sentences providing a high-level description of the proposed CriticalMass Project

Installation Plan:

- List out the proposed installation plan you are proposing.

Technical Requirements:

- List out all technical requirements that need to be taken into account for the installation plan.

Deployment Timeline:

- List out the expected steps of the installation plan and the timeline for each step

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Partnership Roles and Expectations

What the Applicant will Provide:

- List out the contributions you are proposing to provide and the pain points of the Project Partner you are aiming to solve

What is being requested from the Proposed Project Partner

- List out what contributions you are requesting from the proposed Project Partner