

Boston Green Ribbon Commission Higher Education Working Group

A test bed for collaboration and climate action

Universities and colleges in the Boston region are producing leading climate change research that uncovers new insights into the scope of the problem and drives innovative, new solutions globally. We are also dedicated to deploying this cutting-edge science and research on our campuses to model the transition to a clean-energy future and to working together to accelerate the pace of change.



LOCAL

Each University takes action on their campus to mitigate and adapt to climate change, and develop cutting-edge solutions.

REGIONAL

Universities collaborate with the City of Boston and other sectors through the Green Ribbon Commission to leverage strategies and ideas to expedite change.

GLOBAL

We aim to be a global example for taking aggressive climate action and generating innovative and scalable solutions for a sustainable future.

Using latest science to inform ambitious climate action

The Boston Green Ribbon Commission's Higher Education Working Group (HEWG) represents the unique constituency of large research and residential campuses in Boston and neighboring cities.

The HEWG is chaired by Katie Lapp, Executive Vice President of Harvard University, and managed by the Harvard University Office for Sustainability.

The HEWG's members are aggressively reducing emissions by driving efficiency improvements in our buildings, reducing the energy intensity of laboratories, investing in large-scale renewable energy projects, and testing cutting-edge solutions. In collaboration with local and state partners, our resiliency planning efforts are also helping to prepare and assist the region for the impacts of climate change to come, and the impacts already being felt.

HEWG MEMBERS:

- Boston College
- Boston University
- Emerson College
- Harvard University
- Massachusetts Institute of Technology
- Northeastern University
- Tufts University
- University of Massachusetts, Boston

HIGHER EDUCATION INSTITUTIONS REPRESENT

20% of Boston's total greenhouse gas emissions footprint

1 Accelerating change through thought leadership and transparency

The HEWG commissions ground-breaking research and reports to generate a better understanding of strategies for overcoming shared challenges faced by higher education institutions and other research-intensive organizations.

LAB ENERGY USE BENCHMARKING STUDY

The HEWG commissioned an extensive data collection and analysis effort to better understand how Boston-area lab buildings compare to each other, and to lab buildings nationally. This study included 121 lab buildings from seven institutions, and is the first such dataset of its kind. This study is important because labs are typically the most energy intensive spaces on a research campus, and are a growing sector in the Boston region.

The lab energy use analysis has garnered regional and national attention, and was extended to industry partners and other sectors, including hospitals and biotech companies. An anonymized version of the dataset was made publicly available to inform national benchmarking efforts.

RENEWABLE ENERGY PURCHASING

In light of the growing interest of institutions and businesses in purchasing renewable energy, the HEWG commissioned two whitepapers to illuminate the complexities around renewable energy procurement and greenhouse gas emissions accounting. In particular, the HEWG highlighted the need for transparency in communications around renewable deals.

The HEWG is bringing thought leaders like WattTime, who are using machine learning algorithms and real-time electric grid generation data, to inform decision making around renewable procurement.

“Better measuring the variation of impact between projects could soon create new opportunities for renewable energy buyers to begin reducing emissions even faster, more cheaply, more reliably, and more credibly due to the new evidence-based approach.”

— Gavin McCormick and Chiel Borenstein from WattTime and Chad Lauren from Meister Consultants Group (A Cadmus Company)



Harvard University's LEED Platinum Sherman Fairchild Laboratory Building. Copyright Payette. Image by Rachellynn Schoen.

“The higher education institutions in the Boston region have been leaders in creating a process for developing a comprehensive understanding of laboratory energy consumption trends in order to inform action. Their analysis has served as a national example that the International Institute for Sustainable Laboratories (I2SL) plans to employ to inform its replacement to the Labs21 Benchmarking Tool for laboratories throughout the United States.”

— Phil Wirdzek, President and Executive Director, I2SL



Harvard University hosted the first Green Labs Symposium in 2014. Photo by Kris Snibbe.

2 Convening the community on key priorities

The HEWG organizes events for its community and other sectors to learn from national experts in the field, to share best practices, and to discuss challenges and lessons learned to create shared solutions.



TWO GREEN LAB SYMPOSIUM EVENTS for hundreds of people across the regional higher education, health care, and biotech sectors.



CLIMATE RESILIENCY WORKSHOP for members to compare their plans and progress and leverage the collective power of the group on this regional issue.



TWO RENEWABLE ENERGY PURCHASING EVENTS for senior decision makers across several higher education institutions and global companies and institutions from other sectors.



CARBON PRICING event featuring GRC and speakers from Microsoft and Yale University.

3 Informing action with science and research

Faculty from the HEWG institutions are advising the Boston Green Ribbon Commission (GRC) and the City of Boston to ensure that the latest climate science and research is used to inform the development of new policies and programs.

BOSTON RESEARCH ADVISORY GROUP WITH UMASS BOSTON

The GRC convened the Boston Research Advisory Group (BRAG), a multidisciplinary and cross-institution group including participants from many member institutions, overseen by the University of Massachusetts Boston School for the Environment. The BRAG developed the Climate Projection Consensus detailing how Boston's climate will change over the course of the 21st century, including extreme temperatures, sea level rise, heavy precipitation, and coastal storms.

CARBON FREE BOSTON RESEARCH WITH BOSTON UNIVERSITY

The GRC commissioned the Institute for Sustainable Energy (ISE) at Boston University to produce a Carbon Free Boston Report that will be delivered to the City of Boston in the fourth quarter of 2018. The Report will quantify the most

effective combination of technologies and policies to reduce greenhouse gas (GHG) emissions across the energy, buildings, transportation, and waste sectors. Carbon Free Boston will also inform the climate strategies that will be articulated in the City's Climate Action Plan Update, to be released in early 2019.

ON-GOING CLIMATE RESEARCH WITH UMASS BOSTON

(Separately funded by the Barr Foundation as Phase 2 of the Climate Ready Boston work)

Financing Resilience: In April 2018, UMass Boston's Sustainable Solutions Lab (SSL) published a report with recommendations for how to finance implementation of multiple, large-scale climate resilience projects that may require substantial up-front costs while generating benefits over many years. The report identified potential financing approaches and pointed to areas where the next stage of work should focus.

Harbor Barrier Study: SSL's study of the feasibility of a Boston Harbor-wide barrier versus alternative shoreline-based approaches was released in May 2018.

Overview of climate goals and progress of HEWG members



LOCAL INSTALLATIONS*

- **Harvard:** 1,500 kW installed solar capacity
- **MIT:** 70 kW installed solar capacity
- **Northeastern:** 26 kW installed solar capacity
- **Tufts:** 3,923 kW installed solar capacity
- **UMass Boston:** 74 kW installed solar capacity

* Note: RECs were treated differently across different projects. Photo by Lorin Granger: Solar Panel installation.

REGIONAL PURCHASES

- **Harvard:** A contract for 12 MW of wind since 2009 from the Stetson Wind II facility in Maine
3,500 MWh of RECs from this project were retired as part of the strategy to meet the 2016 voluntary goal
- **UMass Boston:** 3.9 MW off-site rooftop solar PV array PPA, Boston/Dedham line

NATIONAL PURCHASES

- **BU:** 205,000 MWh PPA for a new wind project outside New England under negotiation
- **Emerson:** 25,000 MWh of unbundled wind RECs from Renewable Choice Energy purchased annually
- **Harvard:** 6,000 MWh of PJM RECs purchased and retired as part of the strategy to meet the voluntary goal in 2016
- **MIT:** 106,580 MWh estimated annual purchase from bundled power and RECs virtual PPA from solar farm
- **Northeastern:** 5,581 MWh North American RECs purchased annually 2014-2016

HEWG MEMBERS GOALS AND ACHIEVEMENTS

Institution	Climate Goal	Emissions Reductions
Boston College	2,200 MTCDE reduction annually	2,240 MTCDE reduced 2014-2016
Boston University	Zero Net Emissions by 2040 for operations	25% reduction 2006–2016
Emerson College	Carbon neutrality by 2030	55% reduction FY2007-FY2017
Harvard University	Fossil fuel-free by 2050 and fossil fuel-neutral by 2026	30% reduction FY2006-FY2017
Massachusetts Institute of Technology	32% reduction 2014-2030 Aspire to carbon neutrality as soon as possible	16% reduction FY2014-FY2017
Northeastern University	80% reduction MTCDE/GSF 2005-2050	36% reduction in MTCDE/GSF 2005-2017
Tufts University	Carbon neutrality by 2050	12% reduction 2008-2016
University of Massachusetts, Boston	Carbon neutrality by 2050 (all UMass campuses)	14% reduction FY2004-FY2015 (UMass collective)