



EXECUTIVE SUMMARY

OVERVIEW OF THE HIGHER EDUCATION WORKING GROUP—PROGRESS IN CLIMATE MITIGATION

The Green Ribbon Commission (GRC) engages key sectors in the Boston area to support the city's ambitious Climate Action Plan (CAP). Sector and issue-specific Working Groups were convened to **advise** the City on CAP implementation, **engage** sector leadership in aligning their assets and initiatives to support CAP outcomes, and **highlight and promote** best practices within and across sectorsⁱ. The GRC acknowledged that each Working Group would develop customized strategies to address the CAP and expected common elements to comprise each Working Group Strategy, including:

- Conducting sector research
- Recruiting Pacesetters
- Organizing sector data sharing systems on energy use and GHG emissions
- Facilitating sector participation with utility energy efficiency programs
- Sharing best practices and developing common tools
- Developing and implementing collaborative initiatives within the sectorⁱⁱ.

This document focuses on the Higher Education Working Group (HEWG)ⁱⁱⁱ and summarizes the outcomes of a recent stakeholder assessment of HEWG member institution Sustainability Coordinators, their immediate supervisors, and affiliated staff. The stakeholder assessment explored numerous topics from approaches and goals for reducing greenhouse gases to anticipated needs and future opportunities to collaborate. This report summarizes HEWG progress in meeting the climate mitigation challenge and demonstrating sustainability leadership.

GHG MITIGATION AND SUSTAINABILITY LEADERSHIP

The hands-on expertise and visionary knowledge of people comprising the HEWG is broad and deep. Most of the HEWG member institutions are recognized leaders in climate mitigation and sustainability, and began taking action before the 2011 CAP mitigation goals were established.

While the approaches to mitigation and sustainability vary among the HEWG universities according to institutional mission, culture, leadership priorities, and resources, the HEWG's commitment to the CAP's vision is strong and well underway. A commitment to sustainability, energy conservation and efficiency, and GHG mitigation is expressed in all facets of these institutions, from demonstrating academic leadership in research to implementing cutting-edge technologies at the facilities level. Examples include, but are not limited to^{iv}:

- **Governance, policy, and planning:** Sustainability and climate mitigation are part of the institutional culture for most HEWG universities. This is demonstrated through Climate Action Plans, Strategic and Master Plans, and various specific policies (e.g., green building standards). All HEWG universities have Sustainability Coordinators and supporting staff. All have myriad cross-disciplinary campus groups that engage faculty, students, and staff.
- **Energy efficiency and greenhouse gas (GHG) emissions reduction:** All HEWG universities are actively pursuing diverse energy efficiency and GHG reduction measures, including extensive lighting retrofits, heating and cooling efficiency measures, energy audits and green building renovations, and LEED-certified (or LEED-comparable) new building standards. Most have completed comprehensive energy use and/or GHG inventories.

Boston Climate Action Plan Two Areas of Emphasis

(1) Climate Mitigation

- Reduce GHG emissions 25% by 2020, and
- 80% by 2050

(2) Climate Adaptation

Source: Boston's Climate Action Plan Update, A Climate of Progress (April 2011)

- **Materials and purchasing:** Most of the HEWG universities have specific guidelines for green purchasing and creating green offices. Many are leaders in pursuing more climate-friendly food sources.
- **Campus operations:** Because a sustainability and climate mitigation ethic has infused many aspects of campus life for most HEWG universities, they have developed diversified expert staff capable of designing and implementing mitigation projects. Harvard Green Building Services, for example, operates as a comprehensive sustainability and energy efficiency consulting team for all aspects of Harvard University.
- **Investment:** Each HEWG university has committed substantial investments in meeting energy, climate, and sustainability goals. Harvard University and Boston University, for example, joined the Founding Circle of the Billion Dollar Green Challenge, by making a commitment to establish self-managed green revolving funds. MIT has a similar fund—the Silverman Evergreen Energy Fund—to support energy and efficiency projects. MIT joined forces with NSTAR to develop innovative funding strategies to implement its Efficiency Forward program. HEWG institutions also are developing and implementing life cycle cost analysis and other decision-making tools (e.g., Harvard’s Life Cycle Costing calculator).
- **Research:** All of the HEWG universities are recognized research institutions and most have programs directly or indirectly addressing climate mitigation and sustainability; many of these are collaborations with other academic institutions, as well as government and private sector participants. Examples include, but are not limited to:
 - Boston University’s Sustainable Neighborhoods Lab
 - Harvard University’s Center for the Environment; Consortium for Energy Policy Research; Harvard’s Future of Energy Initiative; Sustainability Science Program; Emmett Environmental Law and Policy Clinic; Harvard Business School Business and Energy Initiative
 - MIT Center for Global Change Science; Joint Program for the Science and Policy of Global Change; MIT Energy Initiative; Climate CoLab; The Alliance for Global Sustainability
 - Northeastern University Center for Renewable Energy Technology
 - University of Massachusetts-Boston Center for Sustainable Enterprise and Regional Competitiveness; Collaborative Institute for Oceans, Climate Change and Security.
- **Curriculum:** Each university offers broad-based curricula emphasizing sustainability, energy efficiency/conservation, and GHG reduction.

The extent of HEWG institutional engagement with climate mitigation and sustainability is vast and diverse, and therefore challenging to synthesize^v, although each school has comprehensive web sites documenting their sustainability and climate change activities.

Climate Mitigation Goals and Progress

Of particular interest to the GRC is progress toward meeting CAP mitigation goals, especially the 25% reduction in GHG emissions by 2020. Through the ambitious initiatives outlined above, all HEWG universities have made substantial progress toward this goal.

Three of the five HEWG institutions have GHG goals that meet or exceed the city’s near-term goal of 25% by 2020:

- Northeastern University and University of Massachusetts-Boston were founding signatories of the American College and University President’s Climate Commitment (ACUPCC) in 2007. With this pledge they committed to climate neutrality “as soon as possible.” Northeastern further committed to a 20% reduction in Total Scopes 1 and 2 emissions by 2015 and 80% by 2050. UMass-Boston is on a path to comply with Massachusetts’s Executive Order 484, which calls for a 25% reduction by Fiscal Year 2012, 40% by 2020, and 80% by 2050.
- Harvard University established an internal GHG reduction goal of 30% by 2016, and committed to a “long-term strategy intended to achieve continuous improvement in reducing Harvard’s GHG emissions at the maximum practicable rate.”

Although MIT does not have a numeric GHG reduction goal, they support the Boston CAP and Renew Boston Pacesetter Letter of Intent for a reduction of at least 25% by 2020. MIT focuses, instead, on energy reduction and tracks electrical and other energy usage. In 2009 MIT committed to a 15% reduction in campus electricity use by 2012.

Boston University is currently completing a GHG inventory and is beginning the process of developing a Climate Action Plan. Information from these efforts will be used to develop more specific GHG reduction goals.

HEWG universities have made considerable progress toward achieving their GHG reduction goals and have, or are developing, comprehensive plans and infrastructure to do so. Attachment A to this report summarizes available goal and progress information and provides example best practices used to attain energy and GHG reductions.

ATTACHMENT A. HEWG GHG EMISSIONS REDUCTION GOALS AND PROGRESS

HEWG UNIVERSITY	GHG/ENERGY REDUCTION GOAL	GHG REDUCTION PROGRESS ^{vi}	ENERGY REDUCTION PRGRESS	CAMPUS GROWTH	AWARDS AND RECOGNITION	EXAMPLE BEST PRACTICES
Boston University	Under development	6% reduction in GHG emissions (MTCDE) in 2011 from 2005 baseline, including growth ^{vii}		1,524,126 square feet ^{viii}	<p>AASHE STARS Silver Rating 2010 and 2011; BU reports sustainability metrics annually through STARS</p> <p>Princeton Review Green List: most environmentally responsible "green colleges," 2012</p> <p>Sierra Club Cool Schools, 2012</p> <p>Four Certified Green Restaurants: three are 4-star and one is 3-star</p> <p>Billion Dollar Green Challenge Founding Circle</p> <p>Mass. DOT ECO-Award for Excellence in Commuting Options</p> <p>Sustainable Endowments Institute Green Report Card, B, 2010</p> <p>Additional recognition summarized at: http://www.bu.edu/sustainability/what-were-doing/awards-2/</p>	<p>Centralized Sustainability Office (sustainability@BU) and broader campus-wide stakeholder group involvement in sustainability planning/implementation.</p> <p>Building retrofits for energy efficiency through equipment, lighting retrofits, lighting and energy management systems, and window replacement projects^{ix}.</p> <p>Aggressive oil to gas conversion. Boiler efficiency upgrades.</p> <p>Award-winning Sustainable Neighborhoods Lab collaborates with the City of Boston to create more sustainable neighborhoods.</p> <p>Over 100,000 square feet of LEED Certified space, over 660,000 square feet registered and seeking certification.</p> <p><u>Green Office Certification</u> occupant engagement program.</p> <p>Sustainability Liaison program that engages faculty and staff in peer-to-peer behavioral education.</p> <p>Move-out program donated more than 60 tons of clothing and housewares to Goodwill last year.</p>

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Harvard University	Initial internal GHG reduction goal of 30% by 2016 including growth (from a 2006 baseline), and “long-term strategy intended to achieve continuous improvement in reducing Harvard’s GHG emissions at the maximum practicable rate” ^x	16% reduction 2006-2012, including growth (without growth 24% reduction) ^{xi}		3,000,000 square feet ^{xii}	<p>Princeton Review Green Honor Roll, 2013, 2012, 2011, 2010, 2009</p> <p>Sierra Club Cool Schools, 2012</p> <p><i>Daily Green</i> top ten green colleges</p> <p>Sustainable Endowments Institute Green Report Card, A-, 2011</p> <p>One Certified Green Restaurant: 3-star</p> <p>Billion Dollar Green Challenge Founding Circle</p> <p>Mass. DOT ECO-Award for Excellence in Commuting Options</p> <p>2010 Boston Mayor's Green Business Award Winner (Harvard Business School)</p>	<p>Executive-Level commitment and university-wide participation in climate mitigation and GHG reduction.</p> <p>Clear governance structure: GHG Reduction Executive Committee; student/staff advisory committees; Centralized Office for Sustainability (OFS).</p> <p>GHG Reduction Strategy: OFS convenes facilities & key stakeholders to implement policies and share best practices; energy audits/commissioning on 80% of energy-intensive spaces; 1,000+ energy conservation measures completed--average paybacks under 5 years; energy supply improvements, reduced ~25,000 MTCDE; NSTAR MOU.</p> <p>Development of University-wide policies & tools: Green Building Standards in 2009 (LEED Gold at minimum, applied to projects over \$100,000); a Life Cycle Costing calculator/energy modeling to ensure economic viability of projects & long-term decision making. Most LEED projects of any higher ed institution in the world according to USGBC.</p> <p>Online, interactive Sustainability Impact Report and knowledge-sharing websites (LEED case studies).</p> <p>Engagement Programs: Green Teams & Green Office Program, student eco-REPS, and Student Sustainability Grants.</p>

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Massachusetts Institute of Technology	<p>15% reduction in annual electricity use on campus by 2012 from 2009 baseline of 230,000,000 kWh</p> <p>Support Pacesetter & BCAP goals.</p> <p>Next round of energy goals are currently being developed.</p>		<p>Reduced 34,400,000 kWh over three years to surpass 2012 goal. Reduced electricity use by 15%.</p>	<p>575,000 square feet since 2009</p>	<p>Princeton Review Green List: most environmentally responsible "green colleges," 2012</p> <p>2012 Founding Pacesetter signatory member</p> <p>2011 Northeast Energy Efficiency Partnerships for "Business Leader for Energy Efficiency"</p> <p>2011 City of Cambridge GoGreen Award in the Energy Category</p> <p>2011 Mass. DOT ECO-Award for Excellence in Commuting Options</p> <p>2011 "Campus Sustainability Leader", SEI College Sustainability Report Card</p> <p>2011 Massachusetts Interfaith Power and Light for "Leading By Example"</p> <p>2010 City of Cambridge GoGreen Award (Transportation & Stormwater Mgmt.)</p> <p>2009 EPA Best Workplace for Commuters</p> <p>2006 City of Cambridge GoGreen Award (Waste, Recycling, Transportation Category)</p>	<p>MIT Efficiency Forward program—served as model energy efficiency program for NSTAR and Pacesetter programs.</p> <p>Two most recent new buildings achieved 45% and 35% superior energy performance over code, achieving LEED Gold.</p> <p>Portfolio approach for comprehensive building retrofits for energy efficiency.</p> <p>Laboratory ventilation system optimization for energy efficiency, including fume hoods.</p> <p>Novel masonry wall insulation with moisture monitoring for advanced energy efficiency in renovation.</p> <p>Diverse commuter choice programs reduced SOV rate to 19%.</p> <p>Integrates "living laboratory" approach to provide learning opportunities for students.</p> <p>Engages the whole campus: Green Teams and Green Ambassadors.</p>

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Northeastern University	<p>Internal goals: 20% reduction in Total Scopes 1 and 2 emissions per square foot by 2015 and 80% by 2050</p> <p>ACUPCC Founding member (2007)</p>	<p>16% MTCE reduction in 2011 from 2005 baseline (including campus growth)</p> <p>32% reduction per student FTE (compared to 2005 baseline^{xiii})</p> <p>26% MTCE reduction per gross square foot (adjusted for campus growth) of University Facilities operationally controlled space compared to 2005 baseline</p>		<p>833,811 gross square feet from 2005 baseline representing approx. 15% growth since 2005</p>	<p>Princeton Review Green Honor Roll: 2013, 2012, 2011, 2010, 2009</p> <p>Mass. DOT ECO Award (Pinnacle Level) for Excellence in Commuter Options 2012</p> <p>Mass. Save Business Award 2011</p> <p>Mayor's Green Business Award, City of Boston, 2011</p> <p>University of Indonesia Green Metric Ranking of World Universities 4th in world 2012, 1st in U.S./2nd in world 2011</p> <p>Sustainable Endowments Institute Green Report Card, A-, 2011</p>	<p>Sustainability represents one of the University's three research themes since 2009.</p> <p>Committed to climate neutrality with an ambitious Climate Plan: <i>Sustainable Action Plan: Roadmap Towards Climate Neutrality</i> (2010).</p> <p>Aggressive use of energy efficiency, conservation, and use of energy management controls.</p> <p>Emphasizes energy efficiency retrofits for all campus buildings. All new buildings and major renovations 50,000 square feet or more must be LEED Silver certifiable.</p>

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UMass-Boston	<p>Massachusetts Executive Order 484 goals of 25% reduction by FY 2012, 40% by 2020, and 80% by 2050.</p> <p>ACUPCC Founding member (2007)</p>	<p>Need current data.</p> <p>4833.5 MTCE gross emissions increase from 2008 to 2009^{xiv}</p> <p>2.0 MTCE increase per 1000 square feet from 2008 to 2009</p> <p>Slight reduction (0.003 MTCE) per FTE from 2008 to 2009</p>		<p>No change in building footprint size for reporting period.</p>	<p>Princeton Review Green List: most environmentally responsible "green colleges," 2012, 2011, 2010</p> <p>Commonwealth of Massachusetts University Sustainability Award 2004</p> <p>Mass. DOT ECO-Award for excellence in commuting options in 2011, 2012</p> <p>2012 UMB Biology Dept. Faculty was the recipient of the international Gunnerus Sustainability Award.</p> <p>First in the nation and world Green Chemistry PhD program graduates, 2004</p> <p>Site of the Mayor's 2020 Tree-planting program kick-off as part of Boston's greenhouse gas reduction plan, 2008</p> <p>Collaborative Institute for Oceans, Climate Change and Security established partnerships across campus in climate change research and mitigation, 2010</p>	<p>Incorporates sustainability as a guiding principle for comprehensive campus Master Planning.</p> <p>Sustainability office since 2002.</p> <p>Developed Climate Action Plan (posted on ACUPCC website).</p> <p>Helped develop and committed to Massachusetts LEED Plus green building standards.</p> <p>Presently completing construction of the new Integrated Science Center and groundbreaking of General Academic Bldg. No. 1; both will be LEED silver minimum.</p> <p>Erected its first solar PV system to a capacity of about 85,000 Kwh/yr. in 2011.</p> <p>Part of MA Division of Capital Asset Mgmt. & Maintenance (DCAMM) Accelerated Energy Program that seeks to enhance energy efficiency across state buildings 2012-2015.</p> <p>Sustainability Club helped create a student funded renewable energy fee on this campus in 2006-7.</p> <p>Active member of the State Sustainability Council at the Exec. Office of Environmental Affairs. Also, member of the UMass President's Office Sustainability Council.</p>

ⁱ GRC Background Paper, January 2012

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ⁱⁱⁱ The HEWG is comprised of Green Ribbon Commission members and staffed by the Sustainability Coordinators and their immediate supervisors (usually the Vice President of Facilities/Operations from the participating universities. Five universities currently comprise the GRC HEWG: BU, Harvard, MIT, Northeastern, and UMass-Boston.

^{iv} Attachment A to this Executive Summary and a future report/GRC HEWG Information Sharing Hub will provide additional information about some of the priority initiatives and best practices.

^v One opportunity mentioned in many of the interviews, and requested by the other sectors on the GRC, was to develop more integrative ways to communicate best practices, success stories, lessons learned, and progress.

^{vi} Reductions represent Scope 1 and 2 estimates. HEWG universities are still trying to inventory and track Scope 3.

^{vii} <http://www.bu.edu/sustainability/12141/>

^{viii} <https://stars.aashe.org/institutions/boston-university-ma/report/2012-07-02/11/47/328/>

^{ix} http://www.princetonreview.com/uploadedFiles/Sitemap/Home_Page/Green_Guide_and_Green_OA/Green_Guide/Guide%20to%20Green%20Colleges.pdf and <http://www.bu.edu/sustainability/>

^x <http://news.harvard.edu/gazette/story/2008/07/university-aims-to-reduce-greenhouse-gas-emissions-following-new-task-force-report-2/>

^{xi} <http://www.green.harvard.edu/greenhousegas>

^{xii} <http://www.green.harvard.edu/greenhousegas>

^{xiii} <http://www.princetonreview.com/green-honor-roll.aspx>

^{xiv} <http://rs.acupcc.org/progress/405/>