

# University of Massachusetts Boston Climate Action Plan

Adoption date: Oct 21, 2009 (Campus Sustainability Day)

Tabular Representation of Mitigation Goals and Strategies:

1.	Reduce GHG gases	25%	2012	<ul style="list-style-type: none"> <li>• Comprehensive on-site energy efficiency programs</li> <li>• Installation of energy efficient HVAC equipment</li> <li>• Fuel switching</li> <li>• Purchase of energy efficient products</li> <li>• Increased energy conservation by employees</li> <li>• Installation of on-site renewable energy and combined heat and power systems</li> <li>• Procurement of renewable energy</li> <li>• Use of bio-based and other alternative fuels</li> <li>• Purchase of Renewable Energy Certificates</li> <li>• Water Conservation, re-use and monitoring discharges</li> <li>• Solid waste – reduction, recycling, composting</li> <li>• Sustainability one of core values Master/Strategic Planning</li> <li>• Parking and Transportation – Clean Air incentives</li> <li>• Purchasing- bookstore, dining, contracts</li> <li>• Fuels – fuel oils, marine fuel, hybrid buses/vehicles</li> <li>• Printing – recycled paper, scan to email, Energy-Star</li> <li>• Increased sub-metering</li> <li>• IT – Energy Star devices, power down</li> <li>• Food/Dining: emphasis on organic, locally grown</li> <li>• Increased Green space</li> </ul>
		40%	2020	
		80%	2050	

No.	Emission Targets	Possible Reduction/Procurement goals	Target Date (Fiscal Year)	Possible Strategies
2.	Reduce overall Energy Consumption	20%  35%	2012  2020	<p><i>Energy Conservation:</i></p> <ul style="list-style-type: none"> <li>• Develop and disseminate an agency-wide policy that encourages employees to reduce energy use by turning off lights in rooms when not in use, shutting down computers when leaving work, minimizing use of personal appliances, and other actions that will lead to a reduction in energy consumption and costs. Eg: UMass Boston's Campaign to Conserve, Energy Conservation Committee, Sustainability newsletter, Sustainability website. "Green Corner" on Community Front Page.</li> <li>• Set thermostats 2 degrees lower than usual during the winter and 2 degrees higher than usual during the summer.</li> <li>• Reduce lighting in common areas without compromising safety.</li> <li>• Minimize energy use at facilities during non-work hours.</li> </ul> <p><i>Energy Efficiency Products:</i></p> <ul style="list-style-type: none"> <li>• Use only efficient lights such as compact fluorescent lamps, LED lighting, or other similar products.</li> <li>• Install LED and/or photoluminescent exit signs to replace those with incandescent or fluorescent lighting wherever cost effective.</li> <li>• Install programmable thermostats.</li> <li>• Install motion sensors or timing devices in rooms that are used only intermittently, such as conference rooms, bathrooms, etc.</li> <li>• Procure only computers, monitors, copiers, printers, and other office equipment that are EnergyStar qualified, enable all Energy Star features upon installation, and establish policies and procedures to ensure that such equipment continues to operate efficiently during its life.</li> <li>• Vending Misers or latest technologies for vending machines.</li> </ul>

				<p><i>Energy Efficiency Programs:</i></p> <p><i>(In compliance with emergent directives of MA state energy, building and facilities maintenance agency criteria outlined in EO 484)</i></p> <ul style="list-style-type: none"><li>• Comprehensive, large-scale energy efficiency projects at all appropriate facilities over 100,000 square feet.</li><li>• Implementation of energy efficiency programs such as installation of new equipment, agency coordinated performance contracts, and lighting retrofits at all facilities where the cost of such programs is less than \$1 million.</li><li>• Completion of smaller energy efficiency projects at all appropriate smaller state facilities where the cost of such projects is less than \$100,000, and electric and gas utility incentive programs cover a significant portion of the project cost.</li><li>• All renovation and new construction projects identify and utilize all available utility rebates.</li><li>• All applicable buildings over 50,000 square feet undergo a “retro-commissioning” process to identify and implement low-cost and no-cost energy and water conservation measures with short payback periods.</li><li>• Changes to building processes, funding mechanisms and regulations that are necessary to meet the goals of this Order are developed and implemented.</li><li>• Develop and implement a facility maintenance program and schedule for lighting and HVAC systems, including but not limited to, lubricating, balancing, aligning, vacuuming, cleaning, and checking seals, to ensure optimum efficiency.</li><li>• Ensure that all appropriate staff receives regular training on proper facility management and maintenance practices.</li></ul>
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3.	Procure Renewable Electricity	<p>15% from renewable resources</p> <p>30% from renewable resources</p>	<p>2012</p> <p>2020</p>	<p><i>(In compliance with emergent directives of MA state energy, building and facilities maintenance agencies who will assist in meeting these goals through bundled clean electricity contracts, technical and financial assistance, project management and policy initiatives)</i></p> <p>Possible Renewable Portfolio Standard Eligible Sources of Renewable Power on campus</p> <ul style="list-style-type: none"> <li>• wind,</li> <li>• solar PV (currently being considered)</li> <li>• solar thermal,</li> <li>• biomass,</li> <li>• landfill gas,</li> <li>• anaerobic digestion</li> <li>• On-site generation</li> <li>• RECs</li> </ul>
4.	Utilize Biofuels	<p>3% bio-based for all #2 fuel oil</p> <p>10% bioheat blend for all #2 fuel oil</p>	<p>Winter 2007-2008</p> <p>2012</p>	<ul style="list-style-type: none"> <li>• Purchase non land-use based biofuel (from feedstock) blends from MA State Contracts for # 2 fuel oil.</li> </ul>

5.	New Construction/Renovation	Must meet Mass LEED Plus Green Building Std (LEED certification/LEED Silver)	2007 (effective immediately)	<ul style="list-style-type: none"> <li>UMass Boston will work with state agencies involved in the construction and renovation of state facilities shall ensure that all new construction and major renovation projects are energy and water efficient, conserve the use of resources, and provide healthy and productive spaces for employees, clients, and visitors. It will utilize MASS LEED Plus standard which includes:</li> <li>Certification by the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) program for all new construction and major renovation projects over 20,000 square feet;</li> <li>Energy Performance 20% better than the Massachusetts Energy Code;</li> <li>Independent 3rd party commissioning</li> <li>Reduction of outdoor water consumption by 50% and indoor water consumption by 20% relative to standard baseline projections; and</li> <li>Utilize smart growth criteria.</li> <li>Sustainability one of guiding principles of UMass Boston Master Planning</li> </ul>
6.	Reduce potable water use	10% reduction 15% reduction	2012 2020	<p><i>Indoor Water Consumption</i></p> <ul style="list-style-type: none"> <li>Conduct periodic water audits and system-wide leak detection programs.</li> <li>Work toward metering all significant water uses, measure waste-water discharge.</li> <li>Strictly apply plumbing codes, and actively promote waterless plumbing fixtures, where appropriate.</li> <li>Replace and retrofit older water consuming equipment, such as toilets, faucets and showerheads, with modern, more efficient devices as quickly as possible.</li> <li>Implementation of energy efficiency programs such as installation of new</li> </ul>

				<p>equipment, agency coordinated performance contracts, and lighting retrofits</p> <ul style="list-style-type: none"> <li>• <i>Outdoor Water Consumption</i></li> <li>• Minimize, and wherever possible eliminate, use of potable water and groundwater for outdoor watering purposes, street cleaning, and building washing.</li> <li>• Lower watering frequency.</li> <li>• Improve watering efficiency by watering lawns and plants only when necessary through use of moisture sensors and/or drip irrigation techniques.</li> <li>• Incorporate Low Impact Development (LID) techniques wherever possible, including use of natural landscaping, permeable pavement, and native and drought resistant vegetation to prevent run-off and ensure rainwater infiltration into the groundwater.</li> <li>• When procuring services for lawn and landscape maintenance, require contractors to minimize water use wherever possible through incorporation of the above techniques.</li> </ul>
7.	Other			<ul style="list-style-type: none"> <li>• Solid waste – reduction, recycling, composting</li> <li>• Transportation incentives for cleaner vehicles, commuting options</li> <li>• Purchasing- bookstore, dining, contracts</li> <li>• Fuels – fuel oils, marine fuel, hybrid buses/vehicles</li> <li>• Printing – on 30-100% recycled paper, scan to email, Energy-Star copy machines</li> <li>• Increased sub-metering</li> <li>• Toxics use reduction, e-waste recycling, monitoring other GHG gases</li> <li>• IT – Energy Star devices, power down</li> <li>• Food – emphasis on organic, locally grown, reduces footprint</li> <li>• Use of innovative technologies</li> </ul>

				<ul style="list-style-type: none"> <li>• Energy tracking via annual tracking reports to Ma state environmental agencies and updates to the ACUPCC GHG inventory</li> <li>• Continuous improvement, best management practices</li> </ul>
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## 6. Emissions Targets Summary

Target	Possible Reduction goals/Procurement goals per EO 484	Possible Target Date per EO 484	UMB Baseline
Reduce GHG gases	25%	2012	FY07 (per ACUPCC)
Scope 1 and 2 and 3	40%	2020	(tracking per LBE reports since FY02)
	80%	2050	

## 7. UMass Boston Summary GHG Statistics (Fy07 Baseline):

	Total	Per Full-Time Enrollment	Per 1000 Square Feet	% Offset
Gross emissions (Scopes 1 + 2)	24,088 metric tons of CO <sub>2</sub> e	2.7 metric tons of CO <sub>2</sub> e	9.8 metric tons of CO <sub>2</sub> e	0%
Gross emissions (Scopes 1 + 2 + 3)	27,185 metric tons of CO <sub>2</sub> e	3.1 metric tons of CO <sub>2</sub> e	11 metric tons of CO <sub>2</sub> e	0%
Net emissions	27,173 metric tons of CO <sub>2</sub> e	3.1 metric tons of CO <sub>2</sub> e	11 metric tons of CO <sub>2</sub> e	N/A

### ***Emissions Data Limitations***

*Emissions from the following sources (in metric tons of CO<sub>2</sub>e). 1) 50% of the population uses public transit to the campus. For first baseline year, data for commuting and airline tracking is not available in the format required by the CA-CP calculator but tracking methods are being developed for submission for subsequent years. 2) Shuttle fleet is contractual, fuel nos. not included. 3) Currently not possible to measure wastewater volumes from campus.*

## Scope 1 Emissions

Stationary Combustion	3,916 metric tons of CO2e
Mobile Combustion	423 metric tons of CO2e
Process Emissions	0 metric tons of CO2e
Fugitive Emissions	0 metric tons of CO2e
Total Scope 1 emissions	<b>4,339 metric tons of CO2e</b>

## Scope 2 Emissions

Purchased Electricity	19,749 metric tons of CO2e
Purchased Heating	0 metric tons of CO2e

Purchased Cooling	0 metric tons of CO2e
Purchased Steam	0 metric tons of CO2e
Total Scope 2 emissions	<b>19,749 metric tons of CO2e</b>
<b>Scope 3 Emissions</b>	
Commuting	0 metric tons of CO2e
Air Travel	0 metric tons of CO2e
Solid Waste	1,077 metric tons of CO2e
Paper purchasing	67 metric tons of CO2e
Scope 2 T and D Losses	1,953 metric tons of CO2e
Total Scope 3 emissions	<b>3,097 metric tons of CO2e</b>

## 7. Nonstandard Emissions Targets

Climate action steps will be achieved through continuous improvement, tracking, monitoring, upgrades and collaboration with current and future partners. This is an evolving document which will reflect UMass Boston's ongoing and long term commitment to the environment and sustainability.

## 8. Narratives

A. Summarize the institution's plans for mitigating its greenhouse gas emissions.

UMass Boston is Boston's only public university. It is a signatory to the Talloires declaration and part of the leadership circle for the President's Climate Commitment. In 2004, UMass Boston was awarded the "Sustainable University of the Year" award by the MA State Sustainability Program (LBE). Sustainability is one of guiding principles of the university's Master Planning. Currently, the university is engaged in building new science and academic buildings. Starting in the mid-1990s, campus environmental and sustainability personnel include the environmental health and safety office, the office of sustainability, energy manager and a number of operational departments that help with reducing its environmental footprint. UMass Boston's climate action plan will be accomplished through a host of strategies that have been ongoing for almost a decade in keeping with the university's vision and mission. These include: energy efficiency programs, energy-efficient equipment, fuel switching (vehicle and marine), purchase of energy efficient products, increased energy conservation by employees, installation/procurement of renewable energy and possibly RECs, use of bio-based and other alternative fuels, water conservation, solid waste reduction, recycling, composting, clean air incentives, eco-friendly bookstore products, sustainable dining and foodware options, hybrid buses/vehicles in shuttle fleet, eco-friendly printing recycled paper, scan to email, desktop power management, green building, energy-management systems, use of energy-efficient equipment, energy-star products, increased sub-metering and tracking, toxics use reduction, emphasis on organic, locally grown foods and increased green space. A variety of outreach strategies are utilized to communicate about campus sustainability for eg UMB's sustainability website, Campaign to Conserve website and blog, energy conservation committee, sustainability newsletter, a "Green Corner" on the online community Front Page, conferences related to the environment and sustainability and more. The university also collaborates with the MA state sustainability program, DEP and the EPA.

B. Summarize the institution's plans to make climate neutrality and sustainability a part of the curriculum and other educational experience for all students.

UMB offers doctoral, masters and certificate programs in the environment and sustainability fields through many interdisciplinary academic programs, research opportunities, seminars, internships, etc. The Environmental, Earth and Ocean Sciences Department (EEOS) is the campus' premier interdisciplinary environmental department. EEOS comprises the Environmental, Coastal and Ocean Sciences, Earth and Geographic Sciences and the undergraduate Environmental Studies Program. EEOS, together with another newly-formed entity, the campus-wide Center for Environmental Health, Science and Technology, are the two cornerstones of the University's vision for national preeminence in environmental research and academic programs. Additionally, a four campus collaboration combines to provide the School of Marine Sciences which offers students a joint graduate degree from the University of Massachusetts Amherst, Boston, Dartmouth, and Lowell. The Green Chemistry Track in the Chemistry is the first such doctoral program in the world. The Environmental Biology Track is designed to accommodate students of various science backgrounds with rigorous training in Environmental Sciences/Environmental Biology. Within the college of management, the department of Management and Marketing offers graduate and undergraduate degrees, multiple courses and internships - local, national and international - related to Business Strategy, International Business, International Political Economy, Business and its Environment and Global Warming. Students also intern on sustainability topics with campus departments. Campus events such as Earth Day, America Recycles Day, Focus the Nation have wide participation. Student clubs such as the Sustainability Club have successfully included a renewable energy fee to help support renewable energy on campus, funded reuseable cups, and other 'green' events. Many pre-collegiate programs are starting to engage local school children in green education and green jobs pipelines. Outreach and education in sustainability for students includes involvement in campus Master Planning for sustainability, online green informational portals, handouts, orientations, educational tents, posters, sustainability website, capstone courses students fairs and more.

C. Summarize the institution's plans to expand research related to the achievement of climate neutrality.

UMass Boston's harbor location allows faculty and students engage in research on the environment, climate dynamics and marine ecosystem programs. The university is engaged in building a new Integrated Science Complex on campus to support its world-class faculty and research. The Environmental, Earth and Ocean Sciences Department integrates the natural and social sciences to generate and apply new knowledge about the quality of the environment and the sustainable use of its resources. It focuses on promoting integrated science, planning, policy, and education for understanding earth-system processes and managing the impacts of urbanization on linked watershed and coastal marine systems. The department's strong interdisciplinary makeup and its focus on linked watershed-coastal systems are unique in the country. This could vary from international research collaboration on carbon flux in Antarctica's Southern Ocean to a Sustainable Green Boston Harbors project utilizing the campus' resources and faculty expertise starting just along UMass Boston's harbor marina and beyond. In addition, to specialized laboratories for research, departments use the Nantucket field station, the greenhouse and inshore/near shore research vessels for field work. The School of Marine Sciences combines facilities and resources on four UMass campuses with areas of strength in marine-sciences related teaching, research, and also closely affiliated with a number of on-campus research centers and institutes and off-campus marine research facilities. Faculty in Environmental Biology conduct research in areas such as community ecology, conservation biology, global environmental change among others. Green chemistry faculty are involved in developing and working on an ecologically sustainable chemical research, renewable energy and related projects. Faculty members of the Department of Management and Marketing direct the Center for Sustainable Enterprise and Regional Competitiveness.

D. Summarize the institution's plans to expand community outreach related to the achievement of climate neutrality.

The university's urban location allows UMass Boston's students, faculty, and staff to actively engage with and serve the community. UMB is involved in hosting and participating community projects for neighborhood cleanups, coastswep coastal cleanup events, community outreach meetings related to master planning, long term transit and access to the community. UMB was member of the MA Sustainable Design Roundtable that helped develop MA LEED PLUS standards for green buildings. UMass Boston is also provides the collection site for a biannual hazardous waste collection the City of Boston. Faculty and staff serve on boards and committees and publish related to current environmental and sustainability issues. Many important conferences on sustainability and the marine environment are hosted here on a routine basis. Additionally, projects include faculty and students helping creating a community garden and artwork reflecting themes specific to the community. The harbor location of the campus allows through the academic departments, institutes and marine operations programs to engage in vigorous community outreach and education about the importance of ocean and the harbor islands as a teaching tool about the environment. Tree plantings on campus have been done in collaboration with city and local environmental non-profits. UMB engages with K-12 and pre-collegiate programs also involved in outreach with various local organizations and public schools regarding watershed education and green economy pipelines.

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