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# UMass System Policy on Sustainability (Board of Trustees Policy Statement)

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# University of Massachusetts

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## Board of Trustee Policy Statement

**Policy Title:** Policy on Sustainability

**Policy Number:**

**Functional Area:**

**Brief Description:** Establishes the University’s commitment to sustainability efforts

**Effective:**

**Responsible Officer:**

**Last Reviewed/Updated:**

**Reason for Policy:** The Sustainability Policy exemplifies the long-term commitment of the five campuses of UMass to be good stewards of fiscal and environmental resources. Our environmental responsibility is rooted in the University’s founding as a land-grant institution, designed to bolster good stewardship of land and industry as well as to serve the greater public good. With stewardship in mind, the efforts and achievements of each campus are celebrated while striving to be sustainability leaders, fulfilling our mission of advancing knowledge, and improving the lives of the people of the Commonwealth, nation, and world.

### I. INTRODUCTION

The University of Massachusetts which includes five campuses in Amherst, Boston, Dartmouth, Lowell and the Medical School in Worcester has made a collective commitment to be “good stewards of resources”. This includes responsibly managing our fiscal resources, investing in our capital assets, continuing our commitment to being environmentally responsible, and, in direct alignment with UMass’ core mission, providing transformative education and research in the area of sustainability. Each of the University’s campuses conducts a wide variety of sustainable programs and services many of which are unique to its campus population but all of which serve to make UMass as a whole better stewards of our environmental resources.

In 2007, the University President and all five campus Chancellors signed the American College & University Presidents’ Climate Commitment (ACUPCC). In so doing, the University committed to developing a plan for achieving carbon neutrality, taking concrete initial steps to achieve that, and publishing required progress reports. During that same year, the Commonwealth of Massachusetts Executive Order 484 called “Leading by Example” (LBE) established aggressive targets for state agencies including reducing greenhouse gas emissions and energy consumption. In 2009, the Commonwealth of Massachusetts Executive Order 515 known as the Environmental Purchasing Policy was signed to promote the use of clean technologies, recycled materials, and less toxic products. That Environmental Purchasing Policy is committed to reducing impact on the environment and enhancing public health by procuring Environmentally Preferable Products (EPP) and services whenever such products and services are readily available. Currently, the

University performs required compliance activities in accordance with Massachusetts Department of Environmental Protection regulations relating to solid waste, hazardous waste management, air pollution, underground storage tanks, wastewater, and other applicable regulations.

Since taking office in January of 2015, Governor Charlie Baker has indicated his commitment to energy and sustainability efforts with a focus on diversification of the Commonwealth's energy sources. The Governor's administration has been actively developing policy proposals and advocating for alternative sources of energy. In July 2016, the Legislature approved and the Governor signed an energy diversification law implementing requirements for utilities to enter into long-term commitments for off-shore wind and hydroelectric power. The new law also creates opportunities to finance energy improvements for commercial properties, addresses improvements to renewable power storage; and prioritizes gas leak identification and remediation. While the law does not directly impact the University energy portfolio, the legislation aligns with the University's goal of reducing carbon emissions and increasing renewable energy consumption.

Addressing climate change and carbon pollution have recently become more prevalent topics in the national discourse. On August 3, 2015 President Barack Obama announced a historic commitment to clean energy and reducing carbon emissions through the "Clean Power Plan." The Plan creates the first-ever carbon pollution standards for power plants and is designed to reduce carbon emissions by 32 percent by 2030 from 2005 levels. It further sets goals for each state based on its energy production and allows states to tailor their own state-specific plans to meet the Clean Power Plan goals. The Clean Power Plan bolsters efforts to expand renewable energy generation, build clean energy infrastructure, and promote energy conservation practices.

Over the course of this same period, the University has made historic investments in capital infrastructure to meet the need of increasing student demand but also to address the deferred maintenance needs of many of our campus buildings. Continued infrastructure investment will be needed to address outstanding needs and position our campus infrastructure for the future. As part of these efforts, strategic investments in energy efficiency, renewable energy, emissions reductions, recycling and waste reduction, water conservation, sustainable transportation, and other building/campus improvements have to be incorporated into all efforts of infrastructure and operational planning.

This Sustainability Policy has been developed using the principles currently employed by the campuses for planning and investments, and strategic initiatives such as the ACUPCC and Leading by Example. The University System has a responsibility to the people of the Commonwealth to take a leadership role in preserving resources for future generations by making sustainable decisions today.

## **II. POLICY STATEMENT**

### **OVERARCHING PRINCIPLES**

The University of Massachusetts is committed to responsible stewardship of resources and to demonstrating leadership in sustainable business practices. The University's five campuses should be continuously improving our practices for sustainability consistent with available funding.

The guiding principles for the University of Massachusetts Sustainability Policy include: Sustainability Strategic Planning, Clean Energy, Climate Resilience and Preparedness, Green Building Design and Sustainable Campus Operations, Sustainable Transportation, Waste Reduction and Recycling, Environmentally Preferable Purchasing, Sustainable Food Services, Sustainable Water Systems, and Academic and Research Programming and Community Engagement.

The goals below have been developed to address key elements of these guiding principles.

## **PRINCIPLES WITH GOALS**

### **1. Sustainability Strategic Planning – Integration of sustainability planning, practices, and strategies into the University’s strategic planning processes**

- 1. Goal** – Complete a sustainability plan with a focus on energy projects at each campus, or update any existing plans, to align with the principles and goals outlined in this policy in order to adequately and efficiently understand the energy needs and potential sustainability projects on each campus.

### **2. Clean Energy – Supports the development and use of clean and renewable energy sources**

- 1. Goal** – Achieve UMass’ commitment to carbon neutrality by 2050 or as specified through the sustainability planning process occurring through the development of campus-specific action plans, as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives, and UMass system’s guiding principles towards this goal.
- 2. Goal** - Procure a defined amount of annual electricity consumption through renewable and clean energy sources as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives.

### **3. Climate Resilience and Preparedness - Implementation of strategies to mitigate or reduce environmental impact**

- 1. Goal** - Build climate resilience and preparedness standards into the University’s capital planning process, emergency management and business continuity planning.

### **4. Green Building Design and Sustainable Campus Operations – Strategies to address emissions associated with designing, building, maintaining, and operating campus buildings and grounds.**

- 1. Goal** - Any new construction must meet the MA Leadership in Energy and Environmental Design (LEED) Plus green building standards, (LEED most current version) or other standards as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives, and continue to research and employ improved sustainable building practices.

2. **Goal** - Reduce energy consumption, increase efficiency, and determine goals consistent with capital investments and annual programs implemented in support of energy consumption reduction as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives
  
5. **Sustainable Transportation - Integrating sustainable best practices for the use and maintenance of campus fleets, student/employee commuters, and public transportation options**
  1. **Goal** - Reduce vehicle fuel consumption of the University vehicle fleet through promoting the use of public transportation, reducing the number of single occupancy vehicles and increasing the use of other alternative fuel transportation for faculty, staff, and students.
  
6. **Waste Reduction and Recycling–. Promote strategies to encourage waste reduction and re-use and acknowledge the importance of preventative measures.**
  1. **Goal** – Employ strategies around preventative measures in waste diversion to promote source reduction, re-use and recycling of used materials of.
  
7. **Environmentally Preferable Purchasing – Implement a procurement approach to access environmentally-conscious products whenever applicable and available.**
  1. **Goal** - Establish Environmentally-Preferable Products Procurement Program (EPP) and continue to implement annual procurement goals to move toward alignment with the standards of the Environmental Purchasing Advisory Council wherever appropriate and consistent with available funding.
  
8. **Sustainable Food Services – Supporting sustainable food systems through food and beverage purchases.**
  1. **Goal** – Strive for each campus food service operation to procure sustainable food products while maintaining accessibility and affordability for all students and campus patrons.
  
9. **Sustainable Water Systems – Reducing campus water withdrawals can reduce pressures on local aquifers, streams, rivers, lakes, and aquatic wildlife.**
  1. **Goal** - Reduce potable water usage and determine goals consistent with capital investments and annual programs implemented in support of reducing potable water.
  
10. **Academic and Research Programming and Community Engagement – Ensuring Sustainability is part of Academic and Research programming and part of community engagement efforts**
  1. **Goal** - The UMass Sustainability Council will work with their respective campus curriculum governance units to identify where Academic and Research Programming

and Community Engagement involving Sustainability already exists, and to explore more formal incorporation into core curriculum and identified learning outcomes

### III. REPORTING

The University will measure and track progress on achieving defined goals through the current reporting requirements of the ACUPCC and Leading by Example. With accountability and transparency in mind, the University commits to provide an annual report regarding each campus' sustainability activities to University Board of Trustees.

The University is committed to transparent and consistent reporting standards on sustainability metrics to critical external organizations. It is valuable to the University and the organizations to measure the achievements towards goals on a defined scale and to refine strategies to achieve continuous improvement. The University participates in numerous organizations advancing sustainability and the Commonwealth's Leading By Example initiative which all require reporting as described below

- **Annual Board of Trustees Report:** provide an annual update on sustainability efforts across the University and detail areas of progress towards defined sustainability goals as well as on-going needs in order to achieve established benchmarks.
- **STARS Reporting:** provide necessary updates to the Sustainability Tracking, Assessment & Rating System (STARS), a program of the Association for the Advancement of Sustainability in Higher Education (AASHE) which measures performance in sustainability, and encourages accountability and transparency in all reporting institutions. The reporting system collects data across various metrics organized into four categories: Academics, Engagement, Operations, and Planning & Administration. Each campus shall continue any STARS reporting in progress and work towards appropriate STARS ranking most applicable to the individual campus moving forward while striving for excellence in sustainability.
- **ACUPCC Reporting:** As a member of ACUPCC, institutions are required to report metrics to the organization in order to track progress towards the Presidents' Climate Commitment. ACUPCC incorporates the STARS reporting system for its interim reports, which will stream-line the reporting requirements to this organization.
- **Leading by Example or its Successor Executive Order:** The Commonwealth of Massachusetts program to reduce greenhouse gas emissions requires annual reporting on energy consumption and related costs.

### IV. DELEGATION

The President and Chancellors may delegate all or any part of their authority set forth in this Policy in accordance with the University's delegation policy.

**v. STANDARDS**

The President, in consultation with the Vice President(s) and Chancellors, will issue administrative standards to implement this policy.

DRAFT

# **Background Materials**





**To: Members of the Board of Trustees**

**From: UMass Sustainability Council**

**Re: Sustainability Policy Development and Draft Review**

**Date: August 26, 2016**

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**Purpose:** The purpose of this memo is to provide an overview of the process used by the Sustainability Council to develop a draft sustainability policy.

**Background:** In late 2014, the UMass Sustainability Council, comprised of the campus Sustainability/Energy Managers and staff as well as President's Office staff, began conversations about advancing the University's sustainability efforts in a more comprehensive approach. In the past the Sustainability Council has partnered with the Procurement Council on green procurement practices, collaborated on conference presentations, and strategized on reducing the University's carbon footprint. The discussion among the Sustainability Council centered on the need for a cohesive effort designed to advance the sustainability goals across the University.

The idea that quickly rose to the top was renewing the spirit of the original American College and University Presidents' Climate Commitment (ACUPCC) through the adoption of a Sustainability Policy by the Board of Trustees. The University was an original signatory of the ACUPCC in 2007, committing to develop comprehensive plans to reduce greenhouse emissions and work towards carbon neutrality. The Sustainability Council rallied around the concept and began to sketch out the process of developing a draft policy. With the intention that this policy would reaffirm the University's commitment to the central tenets of the ACUPCC, bolster efforts around climate resilience, demonstrate sustainability as an institutional priority, and set the road map for achieving climate neutrality.

The first step in our process was research. In order to begin drafting, it was imperative to understand what other colleges and universities sustainability policies looked like and comprehend what was being included in those guiding documents. The Sustainability Council divided up a list of institutions who have adopted sustainability polices that are tracked by the Association for the Advancement of Sustainability in Higher Education (AASHE). The committee reviewed these policies to gain an understanding of how institutions choose to structure polices and what types of topics were generally, or specifically, covered. The research into these policies provided the group with some excellent examples to begin to build a framework for an UMass policy. There was some notable similarities between the policies and other resources that are noted in the matrix below:

	Reduce GHG Emissions/Carbon neutrality	Climate Resilience	Green Building Standards	Reduce Energy consumption	Renewable and clean energy sources	Sustainable Transportation	Recycling and Waste Management	Environmentally Preferable Purchasing	Sustainable Food Service	Sustainable Water System	Academic Programming & Community Engagement	Accountability Metrics
University of California	x	x	x	x	x	x	x	x	x			x
University of Kentucky	x			x	x			x			x	x
University of North Carolina - Chapel Hill	x			x	x	x	x				x	x
University of Texas	x		x	x			x				x	x
University of Minnesota - Twin Cities	x		x	x		x	x	x			x	x
Executive Orders 484/515	x		x	x	x	x		x		x		x
AASHE/STARS	x	x	x	x	x	x	x	x	x	x	x	x
ACUPCC	x	x	x	x	x	x					x	x

Building off of the research gathered, the Sustainability Council reviewed the University's benchmark commitments to external groups or associations regarding sustainability issues. In addition to the goals outlined by the ACUPCC the University has been setting targets and reporting progress according to the Massachusetts *Leading by Example* program. The campuses have been tracking metrics according to standards outlined by AASHE and showing progress through their reporting system known as STARS. Utilizing the research conducted helped shape the format of the draft policy and hone discussions about the important areas contained in the documents. The policy is organized by guiding principles outlining the major areas of focus that impact sustainability on campuses. Specific goals, which tackle specific issues, are then outlined under each principle. The Standards section was developed to address each goal with more specific information and determine how it would be evaluated over time. The development of the standards was achieved by answering six vital questions which centers on the importance of the goal, defines the goal, outlines progress achieved, etc. Further the standards have incorporated metrics for each goal to be evaluated on their efficacy moving forward. We have included metrics that the campuses are currently collecting data for reporting to ACUPCC and/or STARS.

Over the course of a roughly year-long process, the principles, goals, and standards were developed, reviewed, and refined. The draft policy has been reviewed and edited by campus stakeholders and sustainability groups to ensure that the document covers the University's comprehensive efforts and aspirations in this area. The approach taken to the review of this draft policy has been collaborative with the desire to incorporate as many perspective has feasible.

**Recommendation:** Given the opportunity, we seek Board member participation in the review of the draft sustainability policy and feedback on the substance of the policy. As we have provided sustainability updates, several Board members have been especially interested in the

development of a Board policy. We feel that at this stage of the process it might be appropriate and enriching to collect any comments, suggested edits, and additions to the draft policy before it would be formally submitted for consideration by the Board. Sustainability is an important value at UMass for many reasons; Board participation in the review of this draft policy will only strengthen the final product and the University will benefit for decades to come.

The desired result would be to incorporate edits from the Board into a final draft for consideration by the President and Board at a time determined appropriate by the President.

**Comparison of University and Commonwealth Initiatives**

	UMass Sustainability Policy Proposed	Sustainability Strategic Planning	Clean Energy	Climate Resilience and Preparedness	Green Building Design and Sustainable Campus Operations	Sustainable Transportation	Waste Reduction and Recycling	Environmental Preferable Purchasing	Sustainable Food Service	Sustainable Water Systems	Academic and Research Programming and Community Engagement
<b>Commonwealth Executive Order 569</b>											
Section 1: Coordinate and make consistent efforts to reduce greenhouse gas emissions and adapt to climate changes; establish GHG emission limits for 2030 and 2040	X	X	X		X						
Section 2: DEP to promulgate rules to ensure the Commonwealth meets 2020 emissions limit; consider limit on other areas (i.e. natural gas leaks, transportation sector)		X			X						
Section 3: Publish, within two years, a Climate Adaptation Plan to prepare for impacts of climate change, strengthen community resilience, and mitigate effects of severe weather events	X		X	X	X			X		X	
Section 4: Designate Climate Change Coordinator within each Executive agency to examine and integrate resiliency planning	X		X								
<b>H.4568 An Act Relative to Energy Diversity</b>											
Hydroelectric and offshore wind power generation procurement		X									
Advanced Energy Storage Technologies paired with renewables		X	X								
Commercial Property Assessed Clean Energy (PACE) Program				X							



# University of Massachusetts

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## Administrative Standard

**Title:** Policy on Sustainability

**Related Policy Number:**

**Functional Area:**

**Effective:**

**Responsible Official:**

**Last Reviewed/Updated:**

### I. INTRODUCTION

Sustainability Standards are intended to assist in the implementation of the University’s Sustainability Policy. The policy provides a framework within which the University reviews its progress toward meeting its Sustainability goals. The University’s commitment to sustainability practices are not strictly limited to the topics outlined. The University endeavors to demonstrate leadership in sustainable practices in any topic area where it is applicable and appropriate in a manner that is compatible with these overarching UMass System sustainability principles.

### II. POLICY

### III. STANDARDS STATEMENT

Principles – Goals – For each of the Principles, goals were established to determine how the principle would be evaluated over time. For background, each of the goals was evaluated to address the following questions:

- Define the goal issue and provide background information to understand the goal in layperson terms.
- Why is this goal important to highlight?
- Where do the University/campuses currently stand in meeting this goal?
- Are there other groups/departments who will be critical stakeholders in meeting this goal?
- What has been done in the past to advance towards this goal?
- What does the University/campus need to do in order to reach this goal?

### IV. RELATED PROCEDURES, FORMS, AND OTHER RESOURCES

<i>Principle</i>	<i>1</i>	<i>Sustainability Strategic Planning – Integration of sustainability planning and strategies into the University’s strategic planning processes</i>
<i>Goal</i>	<i>1.1</i>	<i>Complete a sustainability plan with a focus on energy projects at each campus, or update any existing plans, to align with the principles and goals outlined in this policy in order to adequately and efficiently understand the energy needs and potential sustainability projects on each campus.</i>
<i>Metric</i>		<i>Biennially report on the development progress of an Energy Master Plan/Sustainability Plan consistent with the Capital Plan reporting</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - The purpose of an energy master plan and/or sustainability plan centers on the need to evaluate where each campus stands as it relates to energy projects and show how university commitments for carbon emissions reduction, green building designs, and other sustainability objectives will be met, with approximate timelines and costs for meeting those commitments and objectives To date each campus has undertaken a variety of projects addressing renewable energy or energy consumption. However, some campuses have completed more or less projects than others resulting in the need for evaluating where each campus has the ability to pursue future projects and their impacts. A comprehensive understanding of the impact of recent energy projects and the feasibility of future energy projects will allow each campus to tailor strategies to meet its energy needs and goals.
- **Why is this goal important to highlight?**
  - When undertaking substantial initiatives or new policies it is important to evaluate the current situation to assist in determining the proper course moving forward. Sustainability planning/energy master planning allows each campus to map out options and prioritize projects dependent on funding sources and their general impact on University operations.
- **Where do the University/campuses currently stand in meeting this goal?**
  - Currently, the Amherst campus has completed an Energy Master Plan and is in the process of implementing the plan. However, the other four campuses have not undergone a formal evaluation and planning session.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - While sustainability/energy master plans transcend all areas of the campuses and potentially spark priority conversations, the crucial departments involved in this process are sustainability and facilities/operations.
- **What has been done in the past to advance towards this goal?**
  - As previously stated, the Amherst campus has recently completed an Energy Master Plan and are utilizing it to determine projects and priorities. The other campuses have not undergone this type of comprehensive planning.
- **What does the University/campus need to do in order to reach this goal?**
  - The University must support these planning processes across all of the campuses for a consistent picture of where campuses currently stand and what can be done in the future to meet their energy needs in a sustainable and affordable manner. Each campus must engage their constituencies to engage in this planning as a way to accomplish many of the goals contained in this policy.

<b>Principle</b>	<b>2</b>	<b><i>Clean Energy – Supports the development and use of clean and renewable energy sources</i></b>
<b>Goal</b>	<b>2.1</b>	<b><i>Achieve UMass commitment to carbon neutrality by 2050 or as specified through the sustainability planning process occurring through the development of campus-specific action plans, as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives, and UMass system’s guiding principles towards this goal.</i></b>
<b>Metric</b>		<b><i>Annually publish latest available greenhouse gas (GHG) emissions inventory</i></b>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - In 2007 the President of the University of Massachusetts signed the American College & University Presidents’ Climate commitment (ACUPCC). In doing so the University committed to developing plans to achieve climate neutrality. In the context of this commitment climate neutral is the elimination of net greenhouse gas emissions from campus operations. The University under the commitment is required to reduce greenhouse gas emissions and report on the following: stationary sources (fossil fuels burned in boilers, central heating plants and power plants), mobile sources (fossil fuels used in vehicle fleet), purchased electricity, financed air travel, and commuting of faculty, staff and students. There are also additional reporting categories including refrigerants and chemicals, agricultural sources, other financed travel, study abroad, solid waste, and waste water which when included give a more comprehensive assessment of greenhouse gas emissions. Under this commitment each UMass campus developed baseline greenhouse gas inventories and created climate action plans which set interim goals and outlines mechanisms to achieve climate neutrality.
  
- **Why is this goal important to highlight?**
  - The ACUPCC outlines the importance of this goal as it relates to climate change. Climate change is defined as a change in the global or regional climate patterns. The scientific consensus is that climate change is real and attributed to increases in greenhouse gas emissions largely caused by humans. The speed and scale of climate change has the potential for large scale adverse health, social, economic and ecological effects. The Commitment states that to avoid the worst impacts of climate change greenhouse gas emissions need to be reduced 80% by midcentury.
  
- **Where does the University/campuses currently stand in meeting this goal?**
  - All five campuses have completed climate action plans and report on greenhouse gas emissions and progress to the ACUPCC. It is important to note that the interim goals and climate neutrality are not consistently normalized. Even if they were being normalized they are still not being met because the goals do not compensate for growing energy use intensities (Ex. Labs). Therefore, with the campuses growing, there is a struggle to meet the interim reduction goals and stay on track to become climate neutral by the target date.
  
- **Are there other groups/departments who will be critical in meeting this goal?**
  - Several departments are integral in moving forward to meet this goal, including Facilities, Engineering and Construction, Planning, Transportation, Purchasing,

Sustainability & Energy Management, Power Plant Operations, Administration & Finance, and faculty, staff, and students.

- **What has been done in the past to advance towards this goal?**
  - The campuses have made significant gains in reducing greenhouse gas emissions despite aggressive growth and the addition of new buildings. These reductions come principally from energy efficiency measures, retrofits, fuel switching, and in part from LEED building design.
- **What does the University/campus need to do in order to reach this goal?**
  - High level support and funding is required to develop more extensive carbon reduction plans and to make investments to reduce greenhouse gas emissions.

<i>Principle</i>	2	<i>Clean Energy – Supports the development and use of clean and renewable energy sources</i>
<i>Goal</i>	2.2	<i>Procure a defined amount of annual electricity consumption through renewable and clean energy sources as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives</i>
<i>Metric</i>		<i>Total GHG Emissions Reduced Since LBE Baseline (FY04)</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - When the Leading By Example Executive Order was written and signed into law in 2007, the Governor and the Commonwealth of Massachusetts acknowledged their buildings consumed over 1 billion kwh of electricity, 22 million gallons of heating oil, and 46 million therms of natural gas, resulting in over a million tons of GHG emissions a year contributing to “environmental and health issues...such as global climate change, regional mercury contamination, and urban asthma rates.”

Energy procurement plays a leading role in how the University addresses our long-term commitment to reducing greenhouse gas emissions. The campuses should seek to identify achievable levels of their electricity consumption that comes from renewable energy sources such as wind, solar, hydropower, etc. The University’s energy goals should be consistent with or exceed as feasible the Commonwealth’s energy priorities and funding.

- **Why is this goal important to highlight?**
  - As campuses expand and our energy consumption grows, the University must be seeking electricity from renewable energy sources to alleviate the greenhouse gas emissions impacts. The University is the largest energy consumer in the state and therefore can have a tremendous impact on the overall GHG emissions of Massachusetts. The environmental and human health impacts would be positively affected when the University prioritizes energy conservation, fuel switching, and renewable energy production to reduce GHG emissions.
- **Where does the University/campuses currently stand in meeting this goal?**
  - The campuses have experienced progress in expanding renewable energy sources particularly around solar photovoltaic (PV) projects. The campuses are a part of solar



net-metering projects across the state and exploring other renewable energy options. Additionally, there has been an overall reduction of GHG emissions by 14.7% based on the FY 2004 baseline. Some of the campuses have developed interim emission reduction goals prior to the ACUPCC 2050 carbon neutrality commitment, some have not. Each campus must begin to conduct short term and long term emission reduction planning in order to move toward carbon neutrality and begin implementing wide-scale low-carbon energy strategies. Each campus will need to establish prioritized strategies to reflect local and regional needs, opportunities, and challenges. Some strategies may include, but should not be limited to, On-site renewable energy planning and procurement, energy conservation measures in campus buildings such as continuous commissioning, individual energy reduction strategy implementation and behavior change, along with consideration of net-zero energy growth policies.

- **Are there other groups/departments who will be critical in meeting this goal?**
  - The University will have to engage with our energy planners and facility staff in determining the most cost-effective and consistent renewable energy sources. The campus may have an opportunity to engage in conversations with their local electricity utility companies to discuss available resources in the region and ways to work together. The System Office will need to continue to play an important role of convener of Sustainability, Facility, and Administration from each campus in order to advance climate action planning, goal setting, and progress reporting. Each respective campus must have an active Sustainability Committee including decision makers and active community members from Facilities, Procurement, EH&S, Academics and Research, student leaders, and all major energy consuming units on campus including but not limited to: Residential Life, Dining and Auxiliary Services, Athletics, etc.
- **What has been done in the past to advance towards this goal?**
  - The University is currently a part of solar net-metering projects which allows for the credits to offset their electricity costs through large-scale solar PV projects which are not required to be in close geographical location. Despite rapid physical growth of most campuses within the UMass System and new development of very high energy intensive facilities that help serve the academic mission of the University, the campuses have been effective in reducing energy and emissions through a variety of efforts dating back to the early 2000's. The UMass Building Authority has established the minimum standard for new constructions at all campuses must meet LEED Silver certification.
- **What does the University/campus need to do in order to reach this goal?**
  - The campuses must work to identify the renewable energy sources available to them and how much electricity consumption should be sourced by renewable energy. Carbon emission reduction efforts must be ramped up and prioritized through energy master planning, updates to carbon plan goals and GHG inventories, etc. as well as utilize innovative funding mechanisms such as green revolving funds which have very effective returns on investment throughout higher education and state government

<i>.Principle</i>	<i>3</i>	<i>Climate Resilience and Preparedness - Implementation of strategies to mitigate or reduce environmental impact</i>
<i>Goal</i>	<i>3.1</i>	<i>Build climate resilience and preparedness standards into the University's capital planning process and emergency management and business continuity planning.</i>
<i>Metric</i>		<i>Published plans including measurable objective with corresponding strategies</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - Climate resilience is the ability for a system, institution, or operation to withstand the impacts of climate change and related events and to modify assets and adjust operations based on changing circumstances. Climate resilience planning is a critical process for all major institutions to be mindful of when considering other types of planning.
- **Why is this goal important to highlight?**
  - Climate resilience planning for the campuses will assist the long-term planning at the campus level in order to be proactive about potential weather/climate related events impacting University assets and operations. Including but not limited to specific topic areas, such as tropical storms/hurricanes, snow storms, extreme heat, or sea level rise.
- **Where does the University/campuses currently stand in meeting this goal?**
  - The University has included aspects of climate resilience planning into the University Hazard Mitigation Plan.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - The stakeholders involved in this goal are: facilities, administration & finance, design & construction, operations heads, academic heads, student affairs personnel, student government, IT, emergency management staff and campus communications.
- **What has been done in the past to advance towards this goal?**
  - The University has included aspects of climate resilience planning into the University Hazard Mitigation Plan.
- **What does the University/campus need to do in order to reach this goal?**
  - Continued participation and discussion at a local level; funding that can help both resilience and sustainability efforts.

<b>Principle</b>	<b>4</b>	<b><i>Green Building Design and Sustainable Campus Operations – Strategies to address emissions associated with designing, building, maintaining, and operating campus buildings and grounds.</i></b>
<b>Goal</b>	<b>4.1</b>	<b><i>Any new construction must meet the MA LEED Plus green building standards (LEED most current version) or other standards as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives and continue to research and employ improved sustainable building practices.</i></b>
<b>Metric</b>		<b><i>Annual report of building construction and LEED Certifications</i></b>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - In 2006 the Massachusetts Sustainable Design Roundtable was assembled consisting of a public-private collaboration of 54 state agencies, private firms and non-profit organizations to create *An Action Plan for Green Building in Massachusetts State Construction Project*.
  - The Roundtable has recommended adoption of a new “Massachusetts LEED Plus” standard that specifically mandates certain LEED points for energy performance, building commissioning (i.e. 3rd party verification that a building’s systems work as designed), achievement of smart growth objectives, and water conservation.
  - This criterion evolved into LEED Silver for new buildings and the basic LEED Plus for construction projects less than 20,000 SF
- **Why is this goal important to highlight?**
  - The Roundtable’s report found that in studying 33 green buildings that were already built, by spending an additional \$3-5 per SF in building costs, a savings of \$15 per SF in operational costs from lower energy, water and maintenance was observed.
- **Where do the University/campuses currently stand in meeting this goal?**
  - The University of Massachusetts Building Authority has established the Massachusetts LEED Plus and LEED Silver minimum standard for all new construction. Where applicable the campuses have been designing to the LEED Gold standard or higher.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - There are numerous stakeholders associated with the success of this goal: DCAMM and UMBA, Campus Leadership, University’s Facility Management (Planning, Project Management, Operations & Maintenance), Sustainability and Energy Management, and EH&S.
- **What has been done in the past to advance towards this goal?**
  - The establishment of an energy and sustainability standard of LEED Plus & LEED Silver for the Facilities departments to use when considering the renovations and designs for new buildings.
- **What does the University/campus need to do in order to reach this goal?**
  - The design of new construction and renovations provides the opportunity to evaluate the impact of energy infrastructure from a financial and energy efficiency perspective. The diligent application of these standards on all projects, no matter how large or small, will continue to demonstrate progress towards our goal.
  - The University must also examine opportunities to design beyond LEED standards

depending on the project. Other building standards might be more suitable depending on the project details such as Zero Net Energy Buildings (ZNEB), Passive House, Lab 21 Green Lab Standards, Greening IT practices, Living Building Challenge, and Architecture 2030.

<i>Principle</i>	<i>4</i>	<i>Green Building Design and Sustainable Campus Operations – Strategies to address emissions associated with designing, building, maintaining, and operating campus buildings and grounds.</i>
<i>Goal</i>	<i>4.2</i>	<i>Reduce energy consumption and determine goals consistent with capital investments and annual programs implemented in support of energy consumption reduction, as identified in Goal 1.1 as being necessary to achieve carbon reduction commitments and meet sustainability objectives</i>
<i>Metric</i>		<i>Total Energy Use Intensity Per Square Foot</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - Energy reduction goals need to be met in a variety of ways that include green procurement, enhanced recycling, IT, enhanced tree planting, increasing recycled paper, transit and clean energy options, residential dorms, building complete streets or smart/livable/walkable cities, food sourcing, green construction etc. and thus involves system-level planning over and above physical plant improvements
- **Why is this goal important to highlight?**
  - The importance of this goal stems from the need to identify strategies that reduce the energy consumption of existing campus infrastructure and align the planned capital investments with the goal of minimizing future energy usage. Progress in this goal area has the starkest impact on overall reduction in greenhouse gas emissions.
- **Where does the University/campuses currently stand in meeting this goal?**
  - Most campuses provide annual tracking data to Department of Energy Resources and also to ACUPCC & STARS - and should continue to do so.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - Students are the most critical group on each campus when considering sustainability issues. Outreach to students through more effective, campus-wide education such as on campus social media. University communications should be engaged to reflect these sustainability priorities for the campus and use their expertise in emerging media techniques.
- **What has been done in the past to advance towards this goal?**
  - Since 2013, The System has created the annual sustainability report which has become an annual feature for the Board and the public to learn about the efforts taking place at each campus.
- **What does the University/campus need to do in order to reach this goal?**
  - Most campuses are moving in this direction, however, a greater transparency, and integration with A&F goals and budgeting is needed. Accomplishing significant savings associated with energy consumption is achievable through undergoing master planning exercises. Management of energy systems with a focus on conservation is a crucial part

of reaching this benchmark.

<i>Principle</i>	5	<i>Sustainable Transportation - Integrating sustainable best practice for the use and maintenance of campus fleets, student/employee commuters, and public transportation options</i>
<i>Goal</i>	5.1	<i>Reduce vehicle fuel consumption of the University vehicle fleet through promoting the use of public transportation, reducing the number of single occupancy vehicles, and increasing the use of other alternative fuel transportation for faculty, staff, and students.</i>
<i>Metric</i>		<i>Annually report on the vehicle fleet composition and growing commuting options for faculty, staff, and students.</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - Transportation is a topic which impacts every individual at the University and there are various opportunities to be more environmentally friendly. This goal recognizes the move towards purchasing and utilizing fuel efficient vehicles and alternative fuel vehicles will assist in the need to reduce overall vehicle fuel consumption. It also encourages the implementation of strategies to encourage and assist students and staff to easily utilize alternative modes of transportation to commute to campus, and encourage the use and accessibility of alternative modes of transportation to the broader community in addition to campus stakeholders.
- **Why is this goal important to highlight?**
  - This goal is crucial due to the fact that everyone has transportation needs on a college campus and the strategies used to get people to where they need to go should be considering the environmental impacts. Adjusting transit habits within the campus community can have significant environmental impacts as well as addressing other regional transportation priorities.
- **Where do the University/campuses currently stand in meeting this goal?**
  - The campuses are undertaking projects that align to the outlined goal. Many of the initiatives are highlighted in the annual Sustainability Report. For example, Lowell has instituted a “Park Once Policy”, a carpool program, bike share program, and offers Zipcars. The campus has drawn attention to local public transit options and organized educational campaigns on transit issues. The highlighted programs are also found at the other UMass campuses.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - The campuses will have to continue to engage their campus communities in this process.. The involvement of regional transit authorities and local government could provide an arena to align goals with regional planning efforts around transportation.
- **What has been done in the past to advance towards this goal?**
  - The University has demonstrated a commitment to providing alternative methods of transportation, such as shuttle services, to students, faculty, and staff at each campus.
- **What does the University/campus need to do in order to reach this goal?**
  - Each of the campuses will have to evaluate what programs and initiatives are on-going

that seek to move forward in this goal area and develop plans for the areas where programs do not exist. The planning process should include transportation alternatives as a priority and consider guidance from complete streets, climate resilience strategies, clean fuels, EV charging stations, and green parking garages. It is also important to note that each campus has its own set of circumstances related to their geographic location and demographic make-up and that these considerations must be taken into account.

<i>Principle</i>	<i>6</i>	<i>Waste Reduction and Recycling – Promote strategies to encourage waste reduction and re-use and acknowledges the importance of preventative measures.</i>
<i>Goal</i>	<i>6.1</i>	<i>Employ strategies around preventative measures in waste diversion to promote source reduction, re-use and recycling of used materials.</i>
<i>Metric</i>		<i>Annually report on materials recycled, reused, composted, and disposed</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - This STARS reporting standards recognizes institutions that are diverting materials from landfills and incinerators and conserving resources by recycling and composting. Further, the University must be focused on minimizing the production of waste. While the benefits of recycling and composting cannot be overstated, the importance of preventative measures to avoid the waste should be a primary focus. Decreasing the total amount of materials that are used and discarded offers significant environmental benefits.
- **Why is this goal important to highlight?**
  - The reduction of waste disposed and enhanced recycling efforts can dramatically impact the carbon footprint of the University. These efforts are highly visible and require some educational context. In order to be successful, people must adjust their habits to help produce the desired results.
- **Where does the University/campuses currently stand in meeting this goal?**
  - Each campus has been consistently involved in notable recycling and waste reduction efforts helping to involve students, faculty, and staff while educating the entire campus community about the benefits to recycling and reducing waste. The campuses track their progress and achievements in this area in their own ways.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - The University will need to be actively engaging students, faculty, staff, administrators, and the general public in this goal. Additionally, the University should evaluate if there are current vendors or other parties that could assist with programs or other infrastructure to assist in accomplishing this goal.
- **What has been done in the past to advance towards this goal?**
  - The campuses can point to marked progress in this area through the substantial programming taking place around this issue. The University’s annual Sustainability Report highlights many of the initiatives underway across UMass.
- **What does the University/campus need to do in order to reach this goal?**
  - UMass must sustain the progress achieved by the campuses and capitalize on the

enthusiasm for this issue, thereby generating more programs and strategies such as: the University's total annual waste generation (materials diverted and disposed).

<i>Principle</i>	7	<i>Environmentally Preferable Purchasing – Implement a procurement approach to access environmentally-conscious products whenever applicable and available.</i>
<i>Goal</i>	7.1	<i>Establish Environmentally-Preferable Products Procurement Program (EPP) and continue to implement annual procurement goals to move toward alignment with the standards of the Environmental Purchasing Advisory Council where ever appropriate and consistent with available funding.</i>
<i>Metric</i>		<i>Annually report on purchasing of electronics, office paper, cleaning products, etc. and progress towards meeting established goals</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - As part of the Commonwealth's overall goals of conserving natural resources, reducing waste, protecting public health and the environment, and promoting the use of clean technologies, recycled materials, and less toxic products, this policy committed to reducing State Agency impact on the environment and enhancing public health by procuring Environmentally Preferable Products (EPP) and services whenever such products and services are readily available.
  - Environmentally preferable products are products and services that have a lesser or reduced effect on human health and the environment when compared to competing products or services that serve the same purpose. They may include, but not be limited to, items that:
    - Contain recycled materials
    - Minimize waste
    - Conserve energy and/or water
    - Consist of fewer toxic substances
    - Reduce the amount of toxic substances disposed or consumed
    - Protect open-space
    - Lessen the impact to public health
  - Ensure that at least one person from the University is designated to stay in contact with the state regarding the EPP program and EO 515 to ensure that if updates and changes occur they can be communicated to the Sustainability Group and Procurement Director for implementation.
- **Why is this goal important to highlight?**
  - This goal is important since it complements the other goals surrounding sustainability and will help support those goals through the use of environmentally preferable products wherever possible.
- **Where does the University/campuses currently stand in meeting this goal?**
  - The Director for Enterprise Wide Procurement currently meets regularly with State procurement leaders and will follow-up on the implementation of this program and any changes that the University should be made aware of.

- **Are there other groups/departments who will be critical in meeting this goal?**
  - Working closely with the Procurement Council to ensure that EPP products are available on BuyWays and are competitively priced would be an important step to continue.
  
- **What has been done in the past to advance towards this goal?**
  - To date, specific products have been researched and launched but not a full scale EPP program. (i.e. Paper, ink cartridges)
  - The Director of Enterprise Wide Procurement has been meeting regularly as the University’s designee with the State’s Procurement Directors.
  
- **What does the University/campus need to do in order to reach this goal?**
  - The University must continue to work together to develop the best and most cost effective EPP program for the University and ensure that all information is effectively communicated to the necessary stakeholders using the products. The UMass Sustainability Council will provide recommendations to the Procurement office and collaborate on a regular basis.
  - Goals developed should continue to be met through regular communication with the State.
  - The EPP should also strive to meet or exceed existing campus practices keeping up with STARs criteria or other green purchasing best practices wherever appropriate and consistent with available funding.

<i>Principle</i>	8	<i>Sustainable Food Services – Supporting sustainable food systems through food and beverage purchases.</i>
<i>Goal</i>	8.1	<i>Strive for each campus food service operation to procure sustainable food products while maintaining accessibility and affordability for all students and campus patrons.</i>
<i>Metric</i>		<i>Annually report on the percentage of dining service food products that are third-party verified and/or local and community based sustainable food products.</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - The STARs standards recognizes institutions that are supporting sustainable food through the purchase of their food and beverages. Institutions can do this by prioritizing the purchase of sustainably produced food and beverage items. These actions reduce the social and environmental impacts of food production and help foster robust local economies and food security; improved conditions for farm workers; healthier animals, soils and streams; and secure livelihoods for farmers.
  
- **Why is this goal important to highlight?**
  - This goal is important since food and beverages are a part of everyday life on a college campus and impacting the manner in which food is produced, transported, and consumed can have a systemic impact.
  
- **Where does the University/campuses currently stand in meeting this goal?**
  - Each of the campus have employed individual strategies or programs to address the theme



of this goal. One example has been the commitment to local food options in various ways, including the sponsorship of a weekly farmer’s market at the Medical School.

- **Are there other groups/departments who will be critical in meeting this goal?**
  - To achieve progress in meeting this goal the campuses will have to continue to partner with their food service providers to identify products and other available options to accomplish this goal.
  
- **What has been done in the past to advance towards this goal?**
  - Each campus has been promoting sustainability-minded programs to encourage locally sourced food products and reduce food waste. The Amherst campus has committed to the Real Food Challenge, which requires that 20% of the University food and beverage purchases be local / community-based, fair, ecologically sound and humane by 2020. The Medical School hosts a weekly Farmers Market from June to October bringing local produce and food options to campus. Boston, Dartmouth and Lowell integrate local food options on campus depending on the type of products available and the time of year. Some of the campuses have adopted tray less dining, an effort to encourage students to be more mindful of their food selection thus reducing waste.
  
- **What does the University/campus need to do in order to reach this goal?**
  - The University’s dining services purchase food and beverages that meet at least one of the following criteria: a local or community-based producer and/or third party verified to be ecologically sound, fair and or humane. The University must also work to ensure that all vending operations, convenience stores, or concessions abide by the same standards as the campus food service if different.

<i>Principle</i>	<i>9</i>	<i>Sustainable Water Systems – Reducing campus water withdrawals can reduce pressures on local aquifers, streams, rivers, lakes, and aquatic wildlife.</i>
<i>Goal</i>	<i>9.1</i>	<i>Reduce Potable water usage and determine goals consistent with capital investments and annual programs implemented in support of reducing potable water.</i>
<i>Metric</i>		<i>Annually report the potable water use per weighted campus user compared to baseline.</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - In 2007 the Leading By Example Executive Order 484 which required state agencies to address resource use at state facilities and established the Leading by Example (LBE) Program to oversee the coordinated efforts state agencies, including UMass campuses and state and community colleges, to reduce their environmental impact.
  
- **Why is this goal important to highlight?**
  - Water efficiency is important as fresh water supplies are limited and the current systems of treating, pumping, and disposing of water is energy intensive, wasteful, and can be disruptive to downstream ecosystems. As Executive Order 484 states, buildings account for 13% of potable water use. Potable water is defined as water that meets drinking water standards and is safe for human consumption. Potable water is often used in buildings

not only for drinking water but for toilets, urinals, hand washing facilities, showers, kitchens sinks, irrigation and cooling towers. Non-potable water include rainwater which is captured and stored, reclaimed water which is waste water that is treated and purified for reuse, and grey water which is waste water that has not come in contact with toilet or kitchen waste, and can be used as an alternative to potable water in some applications.

- **Where does the University/campuses currently stand in meeting this goal?**
  - While the LBE program faced challenges in tracking water usage at state facilities, the University of Massachusetts campuses are achieving LEED certification for new building projects, which helps to meet reduction goals for potable water usage. LEED establishes prerequisite and credit options for the adoption of water use reduction strategies. Currently all LEED certified buildings are required to reduce outdoor water use so that either no irrigation is required or irrigation is reduced by 30%. This can be achieved through more efficient irrigation, careful selection of plant species, and the use of non-potable water sources. Indoor water use is required to be at least 20% below code to receive LEED certification. Adoption of low flow fixture and the use of non-potable water in certain applications can reduce the consumption of potable water. Additionally, increasing the efficiency of power plant cooling towers by increasing the number of time the water cycles before being replaced and integrating non-potable water, can also reduce overall potable water use.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - Grounds, Facilities, Engineering and Construction, Planning, and Power Plant Operations will all be critical department to include in the discussion of potable water usage at the university.
- **What has been done in the past to advance towards this goal?**
  - Water use is to be considered early in the construction process for new buildings and renovations, irrigation requirements for landscaping and the use of non-potable water, and opportunities to improve efficiency and the use of non-potable water for cooling towers.
- **What does the University/campus need to do in order to reach this goal?**
  - A challenge in meeting this goal will be that UMass campuses continue to grow and that the reduction goals for potable water established by Executive Order 484 are not normalized. Sources of water need to be metered so that tracking of water use can be effective. Continuing to achieve LEED requirements and credits for installation of low flow fixtures, efficient irrigation, and cooling processes can reduce water usage. Additionally, by using non-potable water where potable water is currently used will decrease overall water use.

<i>Principle</i>	<i>10</i>	<i>Academic and Research Programming and Community Engagement – Ensuring Sustainability is part of Academic and Research programming and part of community engagement efforts</i>
<i>Goal</i>	<i>10.1</i>	<i>Comprehensively integrate sustainability and climate neutrality into the core academic curriculum and research programs to create a means to enable students to use their campus as a living, learning laboratory.</i>
<i>Metric</i>		<i>Annually report on sustainability curriculum available to undergraduate students and on-going curricular developments</i>

- **Define the goal issue and provide background info to understand the goal in lay terms.**
  - This is in concert with the mission of the University “to provide an affordable and accessible education of high quality and to conduct programs of research and public service that advance knowledge and improve the lives of the people of the Commonwealth, the nation and the world.”
  - Currently, the University offers a range of academic offering and research opportunities that provide students with an opportunity to learn about sustainability issues exclusively and as part of other content areas.
  - Campuses should seek to develop academic and research programming that enables students to use their campus as a living, learning laboratory.
  - Climate change and sustainability challenges are one of the foremost issues affecting our collective future and impacting the lives of the world’s citizens. University graduates should all be prepared to meet those challenges in their work beyond the University.
- **Why is this goal important to highlight?**
  - This directly aligns with a major part of the University’s mission to “advance knowledge and improve the lives of the people of the Commonwealth, the nation and the world.”
  - As an institution of higher education the University is positioned to train and educate future leaders, scholars, workers, and professionals to understand and address climate change and sustainability challenges. Moreover, the University can prepare students to respond to the growing challenges our planet faces no matter their field or discipline.
  - Growing our academic offerings and learning outcomes in the areas of climate change and sustainability is a core focus of the ACUPCC and STARS, to which the University has publicly committed itself.
  - The Princeton Review’s 2015 *Hopes & Worries Survey* stated that 60% of students said it would contribute “Very Much/Strongly/Somewhat” to have information about a school's commitment to the environment (ie. from academic offerings to practices concerning energy use, recycling, etc.) in their assessments of whether to apply to or attend the school.
- **Where does the University/campuses currently stand in meeting this goal?**
  - This goal has been addressed on a campus-by-campus level and the robustness of the integration of sustainability into academic programs on each campus varies widely across the University.
- **Are there other groups/departments who will be critical in meeting this goal?**
  - There is a wide range of stakeholders involved in achieving this goal such as Chancellors and Vice Chancellors; Provosts; Deans and Associate Deans; Department Chairs; Faculty Senates on each campus; centers or faculty organizations focused on climate change and

sustainability challenges, like the Climate Change Initiative at UMass Lowell; and students.

- **What has been done in the past to advance towards this goal?**
  - At this time, each campus has been undertaking the work of evaluating where general education requirements are to the identified goal and exploring the feasibility of integrating sustainability topics on a department-by-department basis.
  
- **What does the University/campus need to do in order to reach this goal?**
  - Evaluate where general education requirements currently align to sustainability topics and determine the best practices to integrate key topics related to sustainability into student learning outcomes.

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