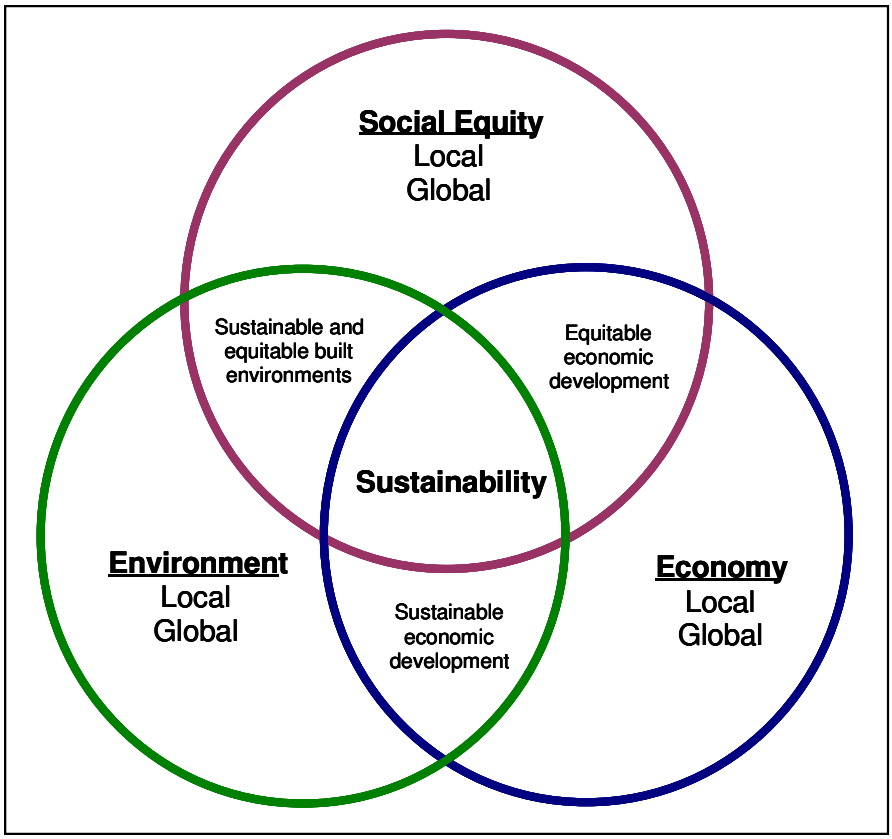
Sustainability in Higher Education at Westfield State College:

A Report from the Ad Hoc Committee on Sustainability



May 14, 2008

Westfield State College

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Preface

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Preface

This report presents the work of the Ad Hoc Committee on Sustainability over the last three months[1]. We broadened the original charge considerably and extended our evaluation in an attempt to capture the issue of Sustainability in Higher Education in its entirety.

Sustainability in Higher Education is more than running a 'green' campus: colleges and universities are responsible for educating the world's citizens and future leaders.

At the same time, sustainability and environmental awareness have to lead to meaningful and immediate actions. The short-term costs of these actions are balanced by the long-term savings.

The science of climate change is quite clear: the climate is changing and human activities are largely responsible for those changes. Humans are no longer in a prevention-of-climate-change situation; rather, our choices today will have a profound effect on the magnitude and rate of future climate change.

> Confronting climate change today means[2]:
>
> *Avoiding the Unmanageable*
> *Managing the Unavoidable*

This report, although 'final' as it pertains to the immediate charge to the Ad Hoc Committee on Sustainability, has to be considered a living document, much like the issue of Sustainability in Higher Education itself.

In this report we examine six functional areas of the college, summarizing the sustainability activities already in place and making recommendations for expanding Westfield State College's commitment. The recommendations present a range from operational changes to curriculum expansion and beyond. A multi-dimensional approach is required to establish a culture of sustainability at Westfield State College. The Committee looks forward to engaging the entire college community as we implement the recommendations contained in this report.

Ad Hoc Committee on Sustainability

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[1] http://www.wsc.ma.edu/garp/sustainability.html
[2] Scientific expert group report on climate change and sustainable development at: http://www.unfoundation.org/SEG/
[3] Resigned from the Ad Hoc Committee on Sustainability 05/01/2008.

1) What is Sustainability in Higher Education?

This section provides a definition of sustainability in the context of higher education, a brief overview of the task of the Ad Hoc Committee on Sustainability as defined by the All-College Committee, and a discussion of existing commitments and obligations of Westfield State College related to sustainability.

1.1) The Charge to the Ad Hoc Committee on Sustainability

The immediate charge to the Ad Hoc Committee on Sustainability (SC) was defined in a memorandum dated February 20, 2008 from Jack Shea (Chair, All-College Committee):

> *"We ask you to consider all ways that this campus can reduce its overall energy consumption by 20 percent in the next five years, to complete a comprehensive inventory of all greenhouse gas emissions, and to begin to develop an institutional action plan for becoming climate neutral."*

The charge, in essence, represents the short-term obligations of Westfield State College in regards to Governor Patricks' Executive Order No. 484 (cf. Section 1.3.1) and the American College and University Presidents Climate Commitment (ACUPCC), signed by Interim President Barry Maloney on February 22, 2007. However, the ACUPCC adopted a uniform starting date of September 15, 2007 (cf. Section 1.3.2) for the implementation phase of the commitment.

The February 20, 2008 memorandum also proposed a timeline for the work of the SC:

Preliminary report to All-College Committee:	April 9, 2008[4]
Final report to All-College Committee:	May 14, 2008[5]

We acknowledge the importance of sustainability and the urgency of our commitments (cf. Section 1.3), but also note that this timeline was challenging. This concern was communicated to the All-College Committee Chair on February 20, 2008 after the committee's first meeting[6] on February 19, 2008 (Appendix 1).

1.2) Defining Sustainability in Higher Education

In 1983, the United Nations convened the World Commission on Environment and Development (WCED), usually referred to as the Brundtland Commission[7] after its Chair Gro Harlem Brundtland. One of the objectives[8] of the commission was to address concerns about *"the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development."* The Brundtland Commission Report[9] *Our Common Future* included the today widely-accepted definition of sustainable development (Fig. 1):

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[4] http://www.wsc.ma.edu/garp/documents/acc040908.pdf
[5] http://www.wsc.ma.edu/garp/sustrepfinal051408.pdf
[6] Meeting minutes and schedules are available at http://www.wsc.ma.edu/garp/sustainability.html
[7] http://www.un-documents.net/a38r161
[8] http://www.un.org/documents/ga/res/42/ares42-187.htm
[9] Our Common Future (1987), Oxford: Oxford University Press. ISBN 0-19-282080-X

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability in Higher Education[10], however, has to extend the practices of sustainability and sustainable development into the class room, thus accepting a leadership role for building a sustainable future for the entire planet. Colleges and universities in the U.S. only represent about 5 to 6 percent of our national carbon foot print, yet we are responsible for 100 percent of the higher education foot print (A. Cortese[11], pers. comm.) – implying a clear mandate for colleges and universities to take an active leadership role in sustainability and sustainability education.

Sustainability in Higher Education seeks to empower our students to be socially, environmentally, and economically responsible citizens of the world in order to improve our quality of life today and tomorrow.

The United Nations recognized the connections between education and sustainability by declaring 2005 – 2014[12] as the *"Decade of Education for Sustainable Development"* with the stated goal to integrate principles, values, and practices of sustainability into all aspects of education and learning across the globe.

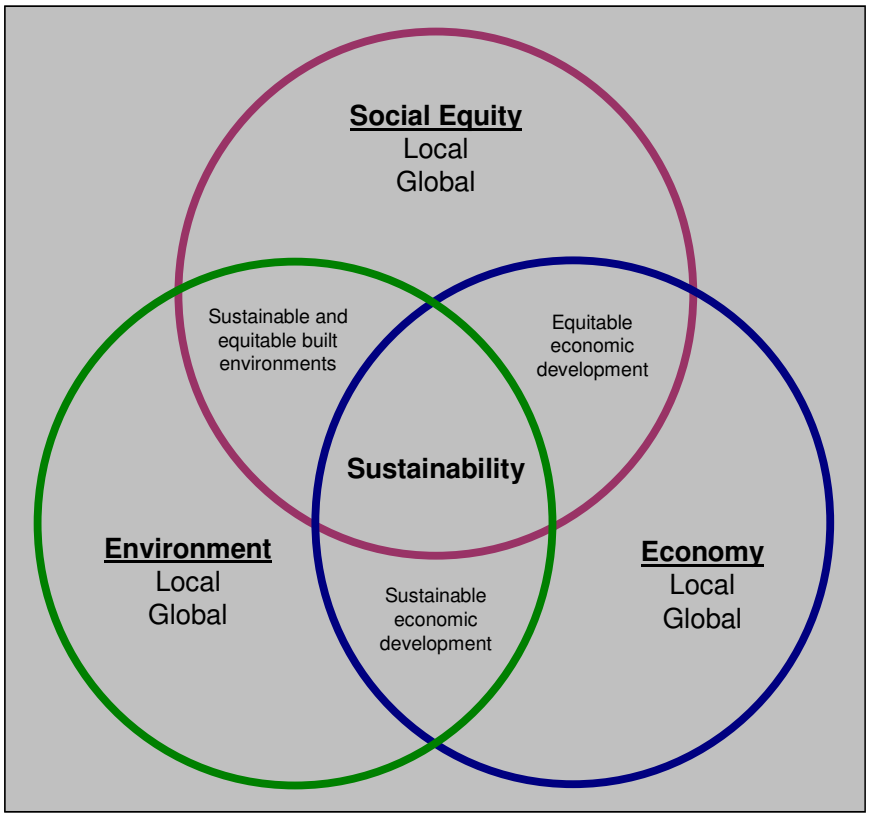

Figure 1. Sustainability and sustainable development is often conceptualized as the intersection of three spheres representing the economy, the environment, and social equity. Sustainability seeks to provide the best outcomes for the human and the natural environments, both today and tomorrow.

[10] Association for the Advancement of Sustainability on Higher Education: http://www.aashe.org/index.php
[11] http://www.secondnature.org/
[12] http://www.unesco.org/education/

1.3) Sustainability Commitments of Westfield State College

Currently, Westfield State College is facing a series of specific commitments and obligations with respect to sustainability, energy conservation, and climate change:

1) Executive Order No. 484 of the Governor of Massachusetts (April 18, 2007)[13]
2) The American College and University Presidents Climate Commitment[14]

We note that sustainability is also an integral part of the mission and strategic plan[15] of Westfield State College (cf. Section 2).

1.3.1) Executive Order No. 484 of the Governor of Massachusetts

Governor Patrick issued Executive Order[16] No. 484 entitled *'Leading by Example – Clean Energy and Efficient Buildings'* on April 18, 2007 (Appendix 2). Executive Order No. 484 supersedes and expands Executive Order No. 438 entitled *'State Sustainability Program'*, signed by former Governor Jane Swift on July 23, 2002. As a result, Westfield State College began tracking its carbon dioxide emissions[17] in FY 2002.

Executive Order No. 484 defines a wide range of sustainability obligations for Westfield State College, including specific targets for energy consumption, energy conservation, renewable energy usage, building construction, and water usage. With respect to greenhouse gas emissions (Fig. 2) and energy consumption (Fig. 3), the following specific targets and dates are defined:

- Reduce greenhouse gas emissions that result from state government operations by 25 percent by Fiscal Year 2012, 40 percent by 2020 and 80 percent by 2050. In calculating emissions, agencies shall use Fiscal Year 2002 as the baseline, and emissions reductions shall be measured on an absolute basis and not adjusted for facility expansion, load growth, or weather.

- Reduce overall energy consumption at state owned and leased (at which the state pays directly for energy) buildings by 20 percent by Fiscal Year 2012 and 35 percent by 2020. Such reductions shall be based on a Fiscal Year 2004 baseline and measured on a BTU per square foot basis.

- Procurement of 15 percent of annual electricity consumption from renewable sources by 2012 and 30 percent by 2020. This mandate may be achieved through procurement of renewable energy supply, purchase of renewable energy certificates (RECs) in accordance with EOEEA[18] guidance and/or through the production of on-site renewable power.

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[13] http://www.mass.gov/Agov3/docs/Executive%20Orders/Leading%20by%20Example%20EO.pdf
[14] http://www.presidentsclimatecommitment.org/
[15] http://www.wsc.ma.edu/About_WSC/Strategic%20Plan/Strategic%20Plan%20.html
[16] See http://www.mass.gov/lib/facts/eo.htm for an official definition and explanation of Executive Orders.
[17] These efforts, coordinated state-wide, led to the FY 2002 Massachusetts Greenhouse Gas Inventory: http://www.mass.gov/envir/Sustainable/pdf/MA_GHG_Inventory_FY02_web.pdf
[18] Massachusetts Executive Office of Energy and Environmental Affairs: http://www.mass.gov/envir/dcs/

Governor Patrick also proclaimed the year beginning April 22, 2007 (= Earth Day) as *"The Year of Energy "* according to the press release[19] associated with the filing of Executive Order No. 484.

It is worth noting that Executive Order No. 484 (cf. Appendix 2) includes a series of specific energy conservation, energy efficiency, and renewable energy measures that may be utilized, including:

- Comprehensive on-site energy efficiency programs
- Installation of energy efficient HVAC equipment
- Fuel switching
- Purchase of energy efficient products
- Increased energy conservation by employees
- Installation of on-site renewable energy and combined heat and power systems
- Procurement of renewable energy
- Use of bio-based and other alternative fuels
- Purchase of Renewable Energy Certificates

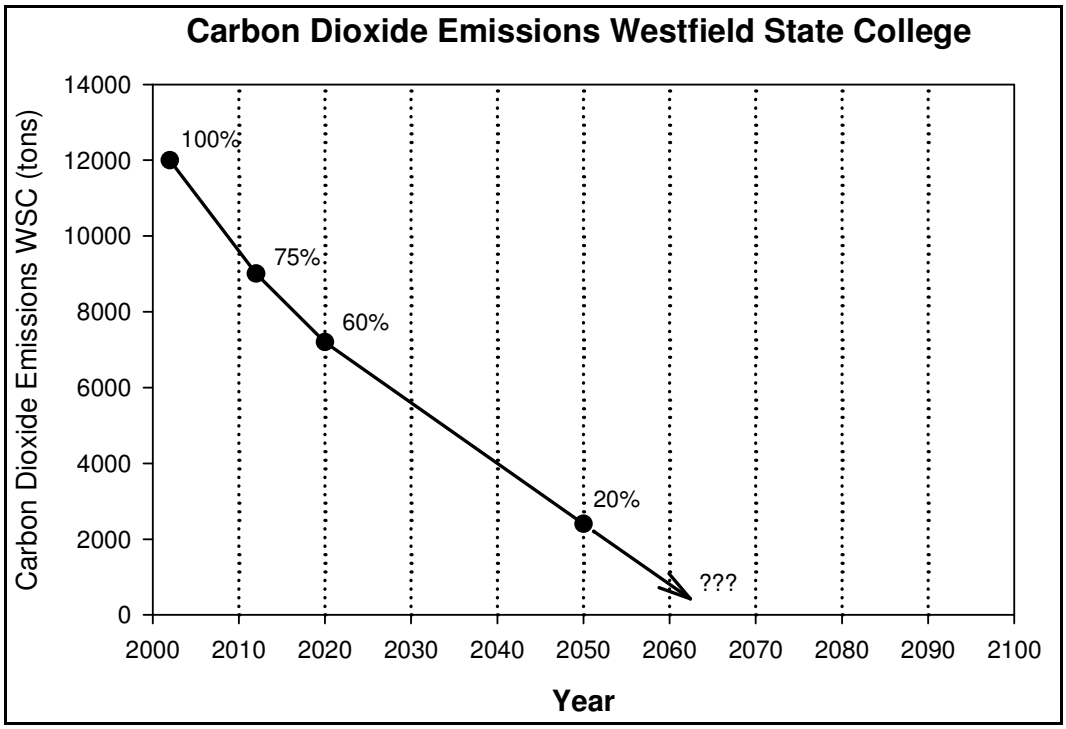

Figure 2. Carbon dioxide emissions of Westfield State College in FY 2002 (~12,000 tons) and the required reductions according to Executive Order No. 484. This graph does not include other greenhouse gas emissions as required by Executive Order No. 484. This graph only includes 'direct' carbon emissions (e.g. heating/cooling, electricity, etc.) and does not include 'indirect' carbon emissions (e.g. commuting by students, faculty, staff, travel, etc.). The arrow represents a simple forward projection towards carbon neutrality, a prerequisite for climate neutrality as demanded by the ACUPCC (cf. Section 1.3.2).

[19] View the press release: http://www.mass.gov/envir/Sustainable/pdf/07_energy_gov_pr.pdf

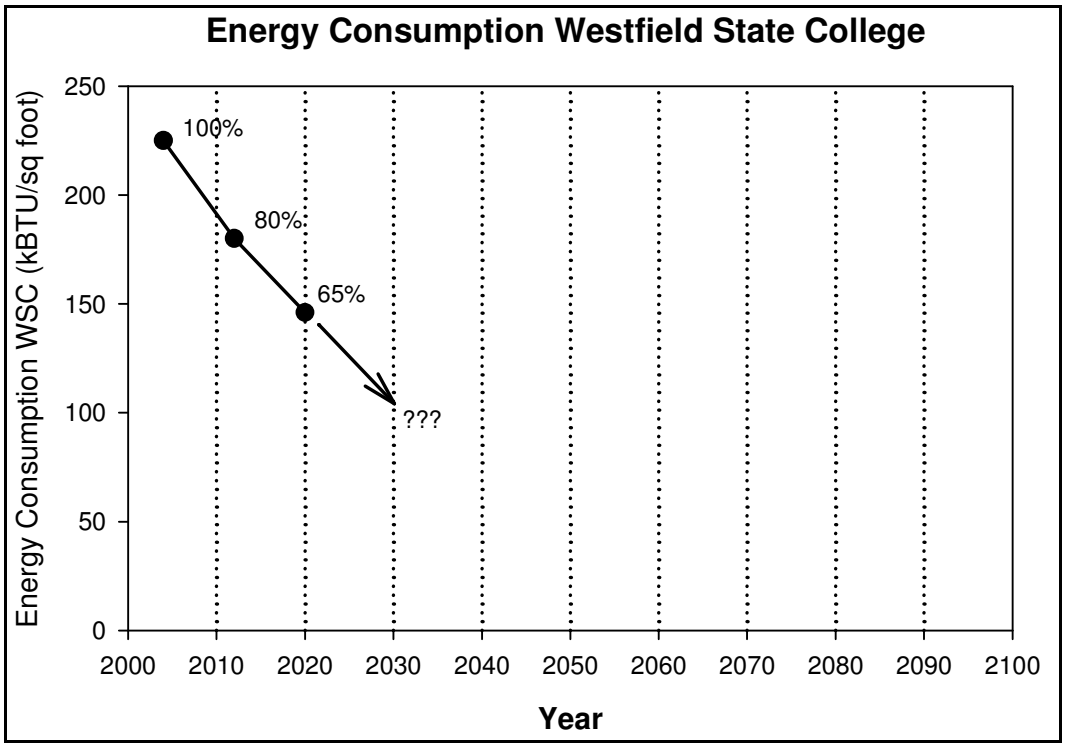

Figure 3. Energy consumption of Westfield State College in FY 2004 (~225 kBTU/sq foot) and the required reductions according to Executive Order No. 484. (BTU = British thermal units)

Executive Order No. 484, especially the reductions required within the next four years for greenhouse gas emissions and energy consumption, poses a significant operational and financial challenge for Westfield State College and requires immediate and meaningful actions (cf. Section 5.2).

1.3.2) The American College and University Presidents Climate Commitment

The American College and University Presidents Climate Commitment (ACUPCC) represents a voluntary commitment of currently over 500 colleges and universities with the ultimate goal of achieving climate neutrality by mid-century. The ACUPCC (Appendix 3) was signed by Interim President Barry Maloney on February 22, 2007. The commitment became effective on September 15, 2007. The ACUPCC establishes a clear sequence of benchmarks or target dates for the period through September 15, 2009.

The ACUPCC commits Westfield State College to initiate and implement[20] at least two of the following seven tangible actions[21] while developing a more comprehensive plan for climate neutrality (cf. Section 5.3, Appendix 9):

1) New campus buildings have to achieve at least LEED Silver standard.
2) Adopt an energy-efficient appliance purchasing policy.
3) Offset all greenhouse gas emission generated by air travel.

[20] The ACUPCC Implementation Guide contains a series of specific steps required for the initiation and implementation of these actions: http://www.presidentsclimatecommitment.org/html/solutions.php
[21] It worth noting that Westfield State College already provides several no cost/low cost public transportation options to the college community (cf. Appendix 9).

4) Provide access to public transportation to the campus community.
5) Within 1 year, purchase at least 15 percent renewable energy.
6) Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.
7) Participation in the national *Recycle Mania* competition and adoption of three or more waste reduction measures.

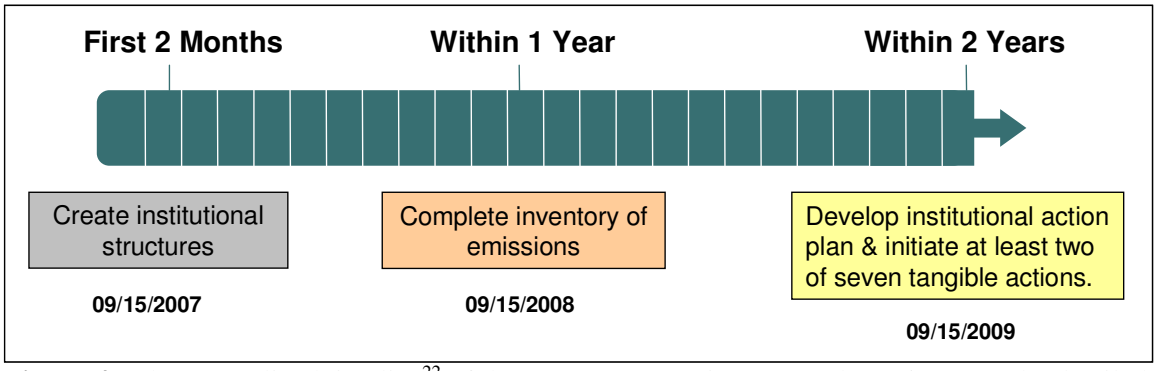

Figure 4. The generalized timeline[22] of the ACUPCC, starting September 15, 2007. The detailed timeline can be found in the ACUPCC (cf. Appendix 3).

With the creation of a full-time campus coordinator position (December 2007, cf. Section 4.2), the work of the Ad Hoc Committee on Sustainability, and the initiation of a comprehensive greenhouse gas emission audit (April 2008, cf. Section 4.3), Westfield State College is currently in compliance with our obligations to the ACUPCC (cf. Section 5.3).

In addition, the ACUPCC requires Westfield State College to make our greenhouse gas inventories, climate action plans[23], and progress reports[24] publicly available[25]. The ACUPCC WWW-site provides a series of resources, solutions, and implementation guides[26], often in collaboration with the Association for the Advancement of Sustainability in Higher Education (AASHE)[27].

1.4) Sustainability in Higher Education at Westfield State College

We applaud Governor Patrick for issuing Executive Order No. 484 and requiring immediate and sustained greenhouse gas emission reductions and energy efficiency improvements. This approach is consistent with the unequivocal global scientific consensus[28] on climate change and human contribution. However, it is important to emphasize that Executive Order No. 484 represents an unfunded mandate, demanding significant action without providing the necessary funding.

[22] Modified from http://www.presidentsclimatecommitment.org/html/press.php
[23] Examples: http://www.presidentsclimatecommitment.org/html/overview.php
[24] Westfield State College's Two-Month report can be viewed at http://www.aashe.org/pcc/reports/
[25] *"We need to measure to manage"* (A. Cortese, pers. comm., http://www.secondnature.org/)
[26] http://www.presidentsclimatecommitment.org/pdf/ACUPCC_IG_Final.pdf
[27] http://www.aashe.org/index.php
[28] www.ipcc.ch

We applaud Interim President Barry Malony for signing the ACUPCC and setting a clear signal to the college community in terms of our commitment to Sustainability in Higher Education.

We note that ***Sustainability in Higher Education*** is a much broader and much more complex issue than framed in Executive Order No. 484 or in the ACUPCC, which are more narrowly focused on climate change, greenhouse gas emissions, and energy consumption. We acknowledge the importance of a modern, sustainable, and healthy campus and consider greenhouse gas emissions and energy consumption as useful starting points.

Yet, Sustainability in Higher Education also requires a cultural shift across the full spectrum of our curriculum, research, outreach, and personal activities. Sustainability has to be integrated into the curriculum and become an integral part of the college experience here at Westfield State College (cf. Section 5.1).

> ➔ Our commitments and obligations (legal or otherwise) require an immediate, concerted, and comprehensive effort by all parts of the campus community.
>
> ➔ Our commitments and obligations (legal or otherwise) require immediate and significant financial investments.

At the same time, our efforts and leadership in ***Sustainability in Higher Education*** can be used to measure and publicize the success of Westfield State College and to distinguish us as an attractive and forward-thinking institution of higher education (cf. Section 5).

2) Sustainability and the Mission of Westfield State College

2.1) Mission Statement

Sustainability is embodied in the core mission of Westfield State College. The opening paragraph of the College's mission statement states:

> *Emphasizing teaching, student advising, and student involvement in the life of the college and the community, Westfield State College's primary mission is to assist its students to develop intellectually and to use their knowledge and skills to improve the social and economic conditions in their communities. The college seeks to instill among members of its community a sense of social responsibility and citizenship.*[29]

Climate change, and the associated concerns of energy use, development equity, and sustainable practices, has been acknowledged by many as one of the defining issues of the 21st century[30]. Preparing students to be agents of change in their communities means, then, preparing them to engage issues of sustainability. To fulfill its mission Westfield State College must educate students on the science of human/environment interaction and provide them the training and skills

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[29] http://www.wsc.ma.edu/Academics/Academic_Affairs/Faculty_Resource_Guide/WSC_Mission.html

[30] See for example:
http://www.time.com/time/health/article/0,8599,1682067,00.html TIME magazine, Nov 8, 2007
http://www.opendemocracy.net/globalization-climate_change_debate/us_elections_4002.jsp
http://www.beehive.govt.nz/node/27741

necessary for work in an increasingly green economy (cf. Section 4.4.2). Our future leaders and citizens must be environmentally literate and understand the material and ethical implications of development choices.

The mission statement goes on to note that the institution itself aims to serve as a community resource and contribute to regional development. Here too, sustainability is significant to the fulfillment of the College's mission. Faculty and staff can be a resource for community organizations and leaders, facilitating the discussion of technical issues on energy and the environment, and educating on best practices (cf. Section 4.5.3) . In addition, faculty research on issues of sustainability can lay the foundation for new initiatives and advance the objective of an improved quality of life for all citizens.

2.2) Strategic Plan

The 2007-2008 Strategic Plan of Westfield State College includes an explicit objective on furthering sustainability on campus:

> ***College Goal #19:*** *Upgrade and maintain campus infrastructure according to ongoing needs assessment and sustainable principles.*[31]

The departments of Academic Affairs, Student Affairs, and Administration and Finance committed to a variety of actions under this goal. Specific actions included: increasing recycling, changing to energy efficient lighting, decreasing paper use with web-based processes and newsletters, initiating student activities such as competitions and fairs, and switching to rechargeable batteries. Nearly all of the actions were undertaken this year (cf. Section 4.2).

3) Sustainability on College Campuses: Examples and Case Studies

This section explores the experiences and successes of other colleges and universities across the country, specifically in terms of campus sustainability plans and implementation strategies of the ACUPCC. This exchange of ideas and experiences is facilitated by the Association for the Advancement of Sustainability in Higher Education (AASHE)[32] and the ACUPCC[33].

In addition, the Sustainable Endowments Institute recently released its 2008 College Sustainability Report Card[34], a comparison of campus and endowment sustainability activities at colleges and universities in the United States and Canada.

> ➔ Westfield State College can become an exemplary institution for Sustainability in Higher Education over the next few years.

[31] http://www.wsc.ma.edu/About_WSC/Strategic%20Plan/StrategicPlan.pdf
[32] http://www.aashe.org/index.php
[33] http://www.presidentsclimatecommitment.org/html/overview.php
[34] http://www.endowmentinstitute.org/sustainability/

3.1) The College of the Atlantic (Bar Harbor, Maine)

The College of the Atlantic[35] is a very small (~300 students), private institution with only one major: human ecology (= the study of human interactions with the environment). The College of the Atlantic claimed on December 19, 2007 to be the first college or university in the country to achieve carbon neutrality. This represented the culmination of the Carbon NetZero[36] project started by the college about 14 month before in October 2006. As a result, the College of the Atlantic brands itself as the 'greenest' college in the world[37].

The College of the Atlantic reduced greenhouse gas emissions and energy consumption as much as possible, using a variety of standard strategies. The remaining ~2,000 tons/year carbon emissions are 'offset' at a cost of about $20,000 per year through a partnership with the Climate Trust[38] (Portland, Oregon), supporting a traffic flow optimization project in Portland (Oregon).

The broader issues of Sustainability in Higher Education (cf. Section 1.4) are also addressed at the College of the Atlantic, but their focus remains clearly on climate neutrality, conservation, and environmental activism[39].

3.2) Middlebury College (Middlebury, Vermont)

Middlebury College was ranked as the second 'greenest' college and university in the world (after the College of the Atlantic, cf. Section 3.1) and deemed a 'hotbed' of climate activism by www.grist.org.

At Middlebury College, a committee of students, staff, and faculty (The Environmental Council) advises the college president on campus environmental policy. The Environmental Council[40] also provides direct incentives through grants *"to keep environmental policy at the forefront of Middlebury experience and planning."*

Middlebury College recently committed[41] to carbon neutrality by 2016, an initiative started by student activism[42] and eventually approved by its Board of Trustees. The college plans to achieve this goal through a variety of measures, such as a new biomass power plant and operational adjustments such as energy efficient lighting and facility upgrades. Carbon offsets will be purchased to achieve carbon neutrality once all other economically feasible efforts to reduce carbon emissions have been implemented. Middlebury Colleges *'Guide to Carbon Neutrality'* is available online, on their comprehensive WWW-site[43] for environmental affairs.

Middlebury College also focuses on *'green dining'* (cf. Section 4.2.4) through a wide variety of actions[44] and information/awareness campaigns.

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[35] http://www.coa.edu
[36] http://www.coa.edu/html/carbonzero.htm
[37] See http://www.grist.org/news/maindish/2007/08/10/colleges/ for an international Top-15 list.
[38] The Climate Trust is a retail carbon offset provider: http://www.climatetrust.org/index.php
[39] http://www.coa.edu/html/sustainability.htm
[40] http://www.middlebury.edu/administration/enviro/ec/
[41] http://www.middlebury.edu/about/pubaff/news_releases/2007/pubaff_633141333185905594.htm
[42] https://segue.middlebury.edu/index.php?action=site&site=midd_shift
[43] http://www.middlebury.edu/administration/enviro/
[44] http://www.middlebury.edu/administration/enviro/initiatives/food/green_dining.htm

The broader issues of Sustainability in Higher Education, beyond the standard 'green' campus operations and environmental issues, do not appear to be a particular focus at Middlebury College, at least explicitly.

3.3) Mount Wachusett Community College (Gardner, Massachusetts)

Mount Wachusett Community College financed over 50 percent of their $4.7-million energy-efficiency upgrades through a *'performance contracting'* arrangement with an energy-service company[45].

Under performance contracting (Fig. 5), the energy-service company performs the energy-efficiency upgrades and guarantees a certain amount of cost savings over the course of the contract. In return, the energy-services company charges an annual fee to be paid for by the realized energy savings. This provides a financing model for large-scale energy-efficiency projects that eliminates any upfront costs to the institution. In an ideal situation (such as at Mount Wachusett Community College), the realized energy savings exceed the guaranteed amount (and fee), resulting in net savings.

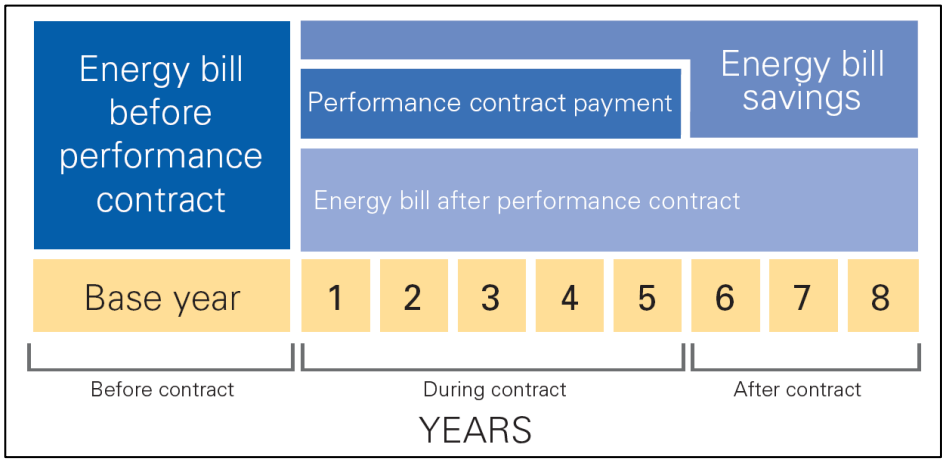

Figure 5. The financing model of performance contracting.
Source: http://www.alliantenergy.com/docs/groups/public/documents/pub/p012608.pdf

Performance contracting is promoted by the ACUPCC as a low-cost financing option for large-scale energy-efficiency projects such as power plant upgrades and building retrofits through a collaboration with the Clinton Foundation[46].

3.4) University of Massachusetts (Amherst)

Sustainability at UMass Amherst appears to be largely limited to Green Initiatives[47] under the auspices of the Facilities and Campus Planning Department. These efforts are coordinated by an Environmental and Performance Advisory Committee with the following charge[48]:

[45] Two articles in the 14 December 2007 issue of the Chronicle of Higher Education: http://chronicle.com/weekly/v54/i16/16a01801.htm; http://chronicle.com/weekly/v54/i16/16a00101.htm
[46] http://www.clintonfoundation.org/cf-pgm-cci-home.htm
[47] http://www.umass.edu/fp/green/
[48] http://www.umass.edu/fp/green/EPAC.htm

- Assess ways to reduce environmental impacts of the campus in a manner which incorporates sound business practices.
- Enhance the campus' ability to gather, track, and analyze environmental performance data and related information and develop report documents.
- Develop a 5 to 10 year plan to reduce the campus' carbon footprint based upon current benchmarks.
- Devise a comprehensive and common-sense way to foster environmental stewardship across the entire organization among and within campus departments, both operational and academic.
- Advise the Chancellor's Executive Board on all matters related to campus environmental performance including adjustments to operating policies and/or practices.

The *Environmental Performance and Green Initiatives* WWW-site[49] provides information under a series of headings, such as energy conservation, water conservation, renewable energy, bio-fuel, recycling and solid waste management, dining services, green building and design, transportation, chemical inventory, mercury reduction, environmental management system, green cleaning, and greenhouse gas emissions.

The WWW-site section for greenhouse gas emissions is especially interesting, as UMass Amherst has the same basic obligations (Executive Order No. 484 and the ACUPCC[50]) as Westfield State College. UMass is currently evaluating, for example, how much of its CO_2 emissions can be considered 'offset' by carbon sequestration through forests already owned by UMass.

3.5) Massachusetts State Colleges

All nine colleges within the Massachusetts State College system[51] are signatories[52] to the ACUPCC.

- Bridgewater State College created The Center for Sustainability[53] to foster the study and application of sustainable practices on campus and across the region.
- The Massachusetts College of Liberal Arts (North Adams) established a Sustainability Committee[54] ('Green Team') to develop and implement campus-wide sustainability plans.
- At Salem State College[55], sustainability is focused on energy efficiency and campus operations.

However, in all three cases the initiatives appear to be limited and narrowly focused on campus operations. Fitchburg State College, Framingham State College, Massachusetts College of Art and Design, Massachusetts Maritime Academy, and Worcester State College do not appear to have any dedicated activities related to sustainability.

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[49] http://www.umass.edu/fp/green/
[50] UMass signed the ACUPCC in April 2007.
[51] See http://www.cleanair-coolplanet.org/partners/mtc_projects.php for a summary of activities across Massachusetts.
[52] http://www.presidentsclimatecommitment.org/html/list_state.php
[53] http://www.bridgew.edu/sustainability/
[54] http://www.mcla.edu/About_MCLA/Administration_and_Finance/Green_Campus/
[55] http://www.salemstate.edu/af/sustainability.php

3.6) The University of Arizona (Tucson, Arizona)

The University of Arizona defines its objective for sustainability in Higher Education as: *"Working to promote sustainability by more effectively managing our energy, water, and cultural and natural resources."* Specifically, their mission statement[56] emphasizes the importance of education, research, and outreach:

> *Through education, research, outreach, and campus operations, the University of Arizona will become a leader in promoting sustainability by more effectively managing our energy, water, and cultural and natural resources. We seek to enhance our quality of life by fostering environmental stewardship and economic vitality without diminishing opportunities for future generations.*

The Campus Sustainability WWW-site [57]provides a series of headings and hot links such as Academic Resources, Greening the Campus, Student Involvement, Community Outreach, and Social Equity (in addition to the more conventional themes of energy, recycling, etc.)

3.7) Arizona State University (Tempe, Arizona)

The term 'sustainability' can be found twice on the Arizona State University (ASU) homepage[58]: once as link to the Global Institute of Sustainability[59] and again as a link to Campus Sustainability[60]. The Global Institute of Sustainability, in essence, represents an umbrella structure that unifies sustainability across campus around four themes: research, education, outreach, and campus operations.

The School of Sustainability[61] at ASU currently offers undergraduate and graduate degrees in Sustainability, as well as a professional certificate program. Their mission[62] includes:

> *The School of Sustainability brings together multiple disciplines and leaders to create and share knowledge, train a new generation of scholars and practitioners, and develop practical solutions to some of the most pressing environmental, economic and social challenges of sustainability, especially as they relate to urban areas.*

Faculty members are either directly part of the School of Sustainability or associated with the School of Sustainability while remaining affiliated with their respective academic departments. The school defines the following seven learning outcomes[63] for their graduates:

1. Think in a holistic way about sustainability problems.
2. Understand the concepts of sustainability, the issues involved, and the disciplines needed to address real-world problems.

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[56] http://www.sustainability.arizona.edu/missiongoals.html
[57] http://www.sustainability.arizona.edu/
[58] http://www.asu.edu/
[59] http://sustainability.asu.edu/giosmain/index.htm
[60] http://sustainability.asu.edu/giosmain/campus/index.htm
[61] http://schoolofsustainability.asu.edu/, established in 2007 as the first in the nation to offer academic degrees in sustainability
[62] http://schoolofsustainability.asu.edu/docs/sos/SOS_Brochure.pdf
[63] http://www.asu.edu/aad/catalogs/general/t-sos.html

3. Evaluate the role and effectiveness of a broad range of methods of inquiry and analysis.
4. Understand the concepts and methods of various disciplines and the ways in which they can address sustainability challenges.
5. Work collaboratively and in multidisciplinary teams.
6. Understand ethical issues related to sustainability.
7. Develop creative, adaptive solutions to sustainability challenges.

3.8) Synopsis

The preceding section was not designed as a comprehensive or systematic review of examples and case studies related to sustainability at other colleges and universities. Nevertheless, the following generalized conclusions can be reached:

- Sustainability at colleges and universities across the country is often narrowly framed and limited to energy efficiency, greenhouse gas emissions, environmental issues, and 'green' campus operations.
- Carbon offsets appear to be part of the path to climate neutrality (cf. Section 4.7).
- The larger concepts associated with Sustainability in Higher Education (cf. Section 1) are rarely specifically addressed or included.
- The eight other colleges within the Massachusetts State College system have not (yet) taken any meaningful initiatives around the issue of Sustainability in Higher Education.

This situation offers an opportunity for Westfield State College to differentiate ourselves within the Commonwealth (cf. Section 5.1). Arizona State University, with its Global Institute of Sustainability, can provide a useful model for Westfield State College, despite the differences in size between the two institutions.

However, such a differentiation theme or focus will require an immediate commitment and concerted effort by Westfield State College, including significant additional financial resources for new faculty positions and education/research/outreach facilities.

At the same time, the current strengths of Westfield State College (e.g. The Environmental Center, the Environmental Sciences Program, and the Geography and Regional Planning Department) are very much complementary with a college-wide theme of sustainability and can provide a solid foundation (cf. Section 4.4.1).

We recommend conducting a comprehensive and systematic review to learn from the experiences and successes of other colleges and universities across the country and globally. This review can be conducted as part of an independent study/internship/senior thesis/work study and can be coordinated by the Campus Sustainability Coordinator and supervised by a faculty member (cf. Section 5.4).

4) Sustainability: A Broad Set of Responses with Benchmarks and Accountability

This section discusses the practical side of Sustainability in Higher Education at Westfield State College, organized as five complementary sub-sections: governance and administration, campus operations, curriculum and education, community outreach, and campus life. Climate neutrality and carbon offsets are discussed in Section 4.7).

Sustainability cannot be achieved or mandated as one single entity, but rather represents the incremental and cumulative result of a multi-facetted strategy (cf. Section 4.1). The underlying principle values sustainability as an integral and 'organic' part of all campus processes, rather than a feature or characteristic that is 'added-on' as an afterthought.

Whenever feasible, we attempted to answer the following two questions with respect to Sustainability in Higher Education for each of the five sub-sections as listed above:

1) What are we already doing successfully (today)?
2) What should we be doing additionally (short-term and long-term)?

4.1) The Concept of Wedges: A Portfolio Approach to Sustainability

The *'stabilization triangle'* and *'stabilization wedges'* concept[64] was developed by S.W. Pacala and R. Socolow of Princeton Universities Carbon Mitigation Initiative[65] as a simple tool to illustrate the greenhouse gas emission reductions that can be made to avoid dramatic climate change.

The main point is that there is no single solution to the problem of human-induced climate change, but rather that an array of available strategies and technologies can be scaled up to yield a discrete stabilization wedge, which – when combined – can together achieve the desired stabilization triangle (Figure 6).

This conceptual framework provides a useful metaphor for Sustainability in Higher Education (cf. Section 1.4): There is no single strategy or technological solution that can be implemented or mandated to achieve a sustainable Westfield State College. Rather, sustainability at Westfield State College is the cumulative result of a portfolio or multi-facetted approach that incrementally promotes a culture of sustainability across all aspects of campus operation, education, and campus life. In fact, some of the most important 'sustainability wedges', such as education, awareness, and outreach (cf. Section 4.4 and 4.5) do not have a directly measurable effect on our greenhouse gas emissions and energy consumption.

[64] http://www.princeton.edu/wedges/index.xml
[65] http://www.princeton.edu/~cmi/

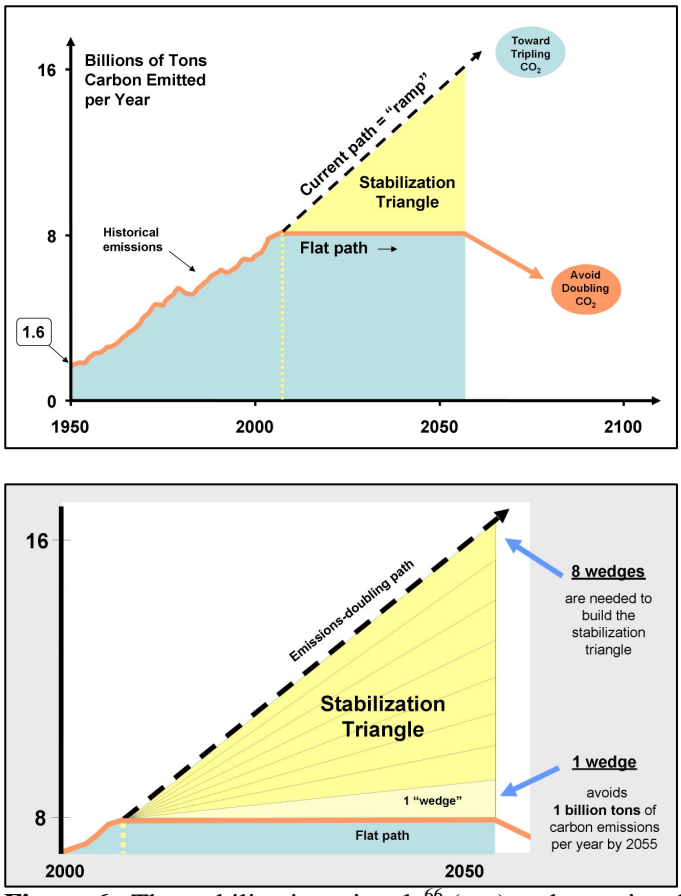

Figure 6. The stabilization triangle[66] (top) and associated stabilization wedges[67] (bottom) provides a framework to conceptualize and organize a wide variety of climate mitigation strategies.

4.2) Governance and Administration

It will require a strong and consistent commitment for sustainability to become a fundamental part of the culture of Westfield State College. The depth of this commitment is reflected in actions already undertaken by the College including: becoming a signatory to the American College and University Presidents Climate Commitment (ACUPCC); undertaking a planning process; and establishing a full time staff position of Sustainability Coordinator at the college.

This type of institutional leadership is critical to the transition to a sustainable future. Both the Board of Trustees and the President have important roles to play as Westfield State College moves forward with the recommendations in this plan (cf. Section 5). Governance and Administration can support sustainability both by expressing a philosophical commitment and by providing financial resources.

[66] http://www.princeton.edu/wedges/presentation_resources/Wedges_Figure1_8.jpg
[67] http://www.princeton.edu/wedges/presentation_resources/Wedges_Figure2_8.jpg

4.2.1) Campus Sustainability Coordinator: Roles and Responsibilities

Westfield State College created the full-time position of Campus Sustainability Coordinator in December 2007 as part of our compliance with the ACUPCC (cf. Section 1.3.2). The roles and responsibilities of this position are defined as follows:

- *Assist in defining goals, performance metrics, and a long-range plan for sustainability.*
  Research and maintain working knowledge of best practices at peer institutions.
  Represent the college's sustainability programs to the public.
  Attend meetings, workshops, seminars as appropriate.

- *Serve as bridge between administrators, faculty, and students as we further our sustainability efforts campus-wide.*
  Encourage and facilitate sustainability programs initiated by student, faculty, and staff community members.
  Foster and coordinate new ideas and concepts for sustainability programming themes.
  Encourage habit-transformation from all segments of the college community.
  Identify materials and resources to supplement, expand, or replace existing sustainability programming.

- *Establish and coordinate funding for sustainable initiatives.*
  Participate in the preparation of grant and external funding proposals.
  Oversee, where appropriate the implementation of grant-funded programs.
  Assist in the preparation of budgets and grants; monitor, verify, and reconcile expenditure of budgeted funds as appropriate.

The Campus Sustainability Coordinator plays a critical role in our sustainability efforts, both by organizing and coordinating activities on campus and by acting as the point-of-contact for our interactions with the AASHE and ACUPCC (cf. Section 5.3). To be effective, the Campus Sustainability Coordinator needs to have a reasonable budget for travel, meetings, support for campus activities, and to sponsor student groups engaged in sustainability activities.

Effective communication plays an integral role in sustainability by increasing the visibility and public awareness of our efforts. This includes:

- Development of a consistent graphic identify for sustainability (e.g. logo, slogan, WWW-site, etc.).
- Distribution of a bi-weekly/monthly sustainability newsletter or bulletin to the campus community to communicate ideas, activities, and successes related to sustainability on campus.

4.2.2) Sustainability Action Plans

Westfield State College's Strategic College Plan (2005 – 2010)[68] Goal #19 (cf. Section 2.2) was targeted during the 2007/2008 academic year:

[68] http://www.wsc.ma.edu/About_WSC/Strategic%20Plan/StrategicPlan.pdf

Upgrade and maintain campus infrastructure according to ongoing needs assessment and sustainable principles.

Action Plan 2007 – 2008[69] compiles and describes specific sustainability strategies planned by each major campus division, including proposed key actions, progress indicators, timelines, and responsibilities (Appendix 4).

Our current and future efforts include:

- All light fixtures have been retrofitted with energy saving T8 light bulbs, compact fluorescent bulbs, and electronic ballasts.
- Leaking steam traps were replaced as were large electric motors in favor of energy saving models.
- The IT Department has instituted several sustainability measures, including a nightly automatic shutoff for all computer labs across campus. The IT Department is working toward a migration to a campus-wide *'auto-standby mode'* after an hour of inactivity on all college-owned computers.
- A print management policy has introduced a fleet of multi-functioning printer, copier, fax machines across campus in place of personal printers (cf. Section 4.3.4).
- Plumbing fixtures such as low-flow shower heads, timed faucets, and water conscious toilets and urinals have been installed campus-wide.
- We have implemented a very effective campus-wide recycling program. Our students have been especially cooperative with this effort.
- We have recently hosted two green-themed, sustainability events on campus. These *'Think Green'* days featured guest lecturers, vendor fairs, and exhibits (cf. Section 4.4.2).
- We are working to develop a plan for campus operations to reduce the total net emissions of greenhouse gases, such as carbon dioxide and methane that contribute to global warming. Total emissions include both direct on-campus emissions and indirect off-campus emissions associated with electricity purchases, commuting, and air transportation.
- We plan to solicit the assistance of faculty who might be able and willing to devote some of their classes to climate-neutrality issues.
- We are exploring the use of wind and solar power as a renewable energy source for the campus.
- We are evaluating the many sustainable dining concepts such as tray-less cafeterias, straw-less beverage consumption, food composting, fryer oil conversion, etc. (cf. Section 4.2.4).
- We are considering hand dryers and motion sensitive paper dispensers to reduce paper towel use.
- We are working towards the campus-wide acceptance of electronic assignment submittal and two-sided printing when printing is necessary.
- We are increasing the numbers of motion sensor lights in areas that are infrequently used.
- We are exploring the use of bicycles and Segway Personal Transporters[70] for campus police and other campus operations.

[69] http://www.wsc.ma.edu/About_WSC/Strategic%20Plan/ActionPlan0708.pdf
[70] http://www.segway.com/

4.2.3) Sustainable Procurement and Transportation/Travel Policies

Procurement/purchasing and (air) travel have been identified by the ACUPCC as two possible 'tangible' action themes for near-term implementation (cf. Section 1.3.2):

- Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products[71] in all areas for which such ratings exist.
- Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.

Procurement and purchasing represent opportunities[72] for Westfield State College to reduce our greenhouse gas emissions beyond the confines of the campus. A sustainable procurement/purchasing strategy not only reduces our direct carbon footprint, but also that of our suppliers. Possible actions include[73]:

- buying locally or regionally produced goods and services to reduce greenhouse gas emissions associated with transport and to support the local economy
- buying lower impact products, such as those made from recycled materials, thereby reducing the lifecycle emissions associated with extraction and processing of raw materials and natural resources
- supporting *'cradle-to-cradle'* sustainable product design by purchasing goods deliberately designed to be recycled and/or composted at the end of their lifecycle
- promoting education around the concepts and practices of sustainability by engaging with suppliers throughout the supply chain
- encourage suppliers to use alternative fuels in the manufacturing and transportation of goods and the rendering of services

Sustainable procurement has to be the central theme of all procurement and purchasing decisions and include vendors, companies, and service providers under contract with Westfield State College.

For example, Rutgers University has developed a comprehensive sustainability policy for purchasing[74], which may serve as a model for Westfield State College. Instead of dictating terms to suppliers, Rutgers defines a range of social and environmental criteria for potential vendors, encouraging them to compete and continuously raise the bar in order to win contracts. For example, Rutgers has encouraged Staples, Inc. to use a bio-diesel blend made of 20 percent soybean oil in trucks making deliveries to Rutgers campuses.

Transportation and travel (e.g. campus fleet, commuting, and campus air travel) are a major component of our greenhouse gas emissions. The ACUPCC recommends the following strategies to limit and eliminate those emissions[75]:

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[71] http://www.energystar.gov/
[72] For more information: http://www.naepnet.org/Microsites/sustainability/sustainability.html; http://www.aashe.org/resources/purchasing.php
[73] http://www.presidentsclimatecommitment.org/html/procurement.php
[74] http://purchasing.rutgers.edu/green/index.html
[75] http://www.presidentsclimatecommitment.org/html/transportation.php

- Transition to more efficient campus fleet, preferably fueled with non-fossil fuels such as electricity, biofuels, or hydrogen.
- Use of vehicles only when absolutely necessary.
- Implementation of transportation management strategies, such as free/low-cost public transportation, telecommuting/flexible scheduling, bicycle sharing/rental programs, web-conferencing, car sharing, and educational outreach programs to encourage commuters to use more sustainable transportation options.
- Use of carbon offsets for the remaining greenhouse gas emission, especially those associated with domestic and international air travel[76].

Cornell University, for example, has raised parking fees, redrawn parking systems to favor carpooling, integrated school transit systems with the city's, and extended free public transportation throughout the county to anyone who doesn't get a parking pass. These efforts have saved 417,000 gallons of fuel and 10,000,000 vehicle miles traveled annually, cutting costs by more than $36 million and reducing greenhouse gas emissions by 51,100 tons over 12 years. Many colleges and universities are implementing plans to make their campuses more pedestrian and bicycle friendly (cf. Section 3.2), thereby saving money and reducing their ecological footprint.

Enhancing and expanding public transportation for the college community constitutes the top-ranked tangible action with respect to the ACUPCC (cf. Section 5.3 and Appendix 9).

4.2.4) Sustainable Food Services

Tremendous opportunities exist to enhance and expand sustainability efforts in our dining common[77] and with respect to food services operations across campus in general. This can be an integral and visible part of the campus-wide efforts to integrate sustainability into every aspect of college life at Westfield State College. For example, the purchasing[78] of local produce and goods means fresher and healthier dining choices and has a positive impact on the local and regional economy by helping to create and expand a market these products. In addition, it allows us to reduce our carbon footprint.

Example 1: Colby College (Waterville, ME)
Colby College partnered with Colby's Dining Services Provider (Sodexho[79]) to enhance and expand sustainability efforts in Colby dining halls. The efforts included[80]:

- Raising awareness about food sources and the environmental impact of obtaining these foods.
- Increasing local and organic food purchases.
- Establishing an eco-friendly fish and seafood purchasing policy.
- Reducing pre- and post- consumer food waste and enhance ongoing composting efforts.
- Reducing solid waste from food packaging and other sources.

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[76] http://www.tufts.edu/tie/tci/carbonoffsets/TCI-offset-handout.htm
[77] http://www.aashe.org/resources/dining_links.php
[78] http://www.aashe.org/resources/pdf/food_policy_guide.pdf
[79] Sodexho is also the dining services provider at Westfield State College: http://www.sodexhodiningatwsc.com/
[80] http://www.colby.edu/green/dining.htm

- Providing fresher and healthier meals through inventory control strategies and *"just in time"* cooking.
- Securing the policy of paperless dining halls by launching an effort to retrieve reusable dishware from dorm rooms.
- Reduction of food waste and composting.
- Creation of a dedicated Dining Services Sustainability WWW-site[81].

An experiment termed *"Tray-less Thursday"* to encourage students to reduce food waste by taking only the amount of food they would actually eat showed that an average of 260 lbs of food waste can be saved per day with tray-less dining.

The members of the Colby community were excited about the prospect of serving more local foods in the dining halls and interested to learn about the sources of their food. Local and organic food options were supported by the students. *'Greening the Dining Service'* also raised the overall environmental and sustainability awareness across campus.

The biggest challenge is modifying individual behavior to reduce food waste, making it necessary to operate an effective waste separation and composting program. It is necessary to help students make the connections between their individual actions and the cumulative impact the campus has on the environment.

Example 2: Middlebury College (Middlebury, VT)
Middlebury College is considered one of the top 'green' colleges in the country (cf. Section 3.2) and it is therefore not surprising that *'Green Dining'* through sustainable practices[82] is one of the main strategies.

More importantly, Middlebury College is using the dining hall as an effective place to share information and to raise awareness of environmental issues and sustainability, essentially taking advantage of *'down time'* for the students.

Example 3: Springfield College (Springfield, MA)
Springfield College[83] can serve as a local success story of how enhanced sustainability within the dining services[84] can lead to better and less expensive food choices for the campus community. The following list of actions (with estimated results) has been implemented at Springfield College and can serve as a *'proof of concept'* for Westfield State College:

Action: Elimination of trays; Estimated Results:
- Daily water savings = 668 gallons
- Annual water savings = 149,632 gallons
- Daily chemical savings = 13 gallons
- Annual chemical savings = 2,820 gallons
- Academic year financial savings = $2,629
- Reduction in juice consumption = 191 gallons per month
- Reduction in soda (bag in the box) consumption = 36 bags/month

[81] http://www.colby.edu/dining.serv/html/commserv/environment.html
[82] http://www.middlebury.edu/administration/enviro/initiatives/food/green_dining.htm
[83] http://www.spfldcol.edu/home.nsf/home
[84] http://www.campusdish.com/en-US/CSNE/Springfield/Sustainability/

Action: Elimination of straws; Estimated Results:

- Reduction of 450 pounds of waste per year

Action: Purchasing biodegradable paper towels; Estimated Results:

- Annual water savings per year = 15,040 gallons
- Annual energy savings per year = 8,800 kilowatts
- Because they are biodegradable, an estimated 6.5+ cubic yards of landfill saved.

Action: Food composting; Estimated Results:

- Food /paper napkin waste picked up by local farmer
- Waste hauling savings = $1,000/month

Action: Donate fryer oil to local recipient/converter; Estimated Results:

- Recipient converts fryer oil to bio diesel for vehicles.
- Financial savings: $75/month

The purchasing of local and organic food (e.g. High Lawn Milk[85], Lee, MA) does often increase the financial cost for the product. This negative impact has to be balanced against the clear benefits of local and organic products, such as better quality, healthier produce, support of local farmer, and greater sustainability.

However, when evaluated across food services as a whole, the combined *monetary savings* realized from various sustainable practices could go toward significantly upgrading dining service and food quality.

Sustainable Food Services at Westfield State College

We recommend making sustainability and environmental practices the overarching theme of food services at Westfield State College, especially with respect to the operations of the dining common (Fig. 7), as this represents a high-impact and high-visibility part of campus life and promotes a cultural shift of the campus towards sustainability (cf. Section 5.1).

We expressed our support for sustainability actions around campus food services in an April 22, 2008 letter to the Vice President of Finance and Administration (Appendix 5):

> *The Sustainability Committee would like to go on record as stating that dining services on campus should, along with other institutional practices, integrate sustainability measures.*

Colby College, Middlebury College, and Springfield College can serve as successful case studies for sustainability in campus food services, while recognizing that conditions and requirements are different at Westfield State College.

Education, changes to individual behavior, and food awareness have to be a central emphasis of *'Green Dining'* at Westfield State College.

[85] http://www.highlawnfarm.com/

Figure 7. Dining Common at Westfield State College: http://www.sodexhodiningatwsc.com/

4.2.5) Funding Opportunities, Grants, and Meetings

Funding opportunities (both external and internal) and participation of Westfield State College faculty, staff, and students at relevant conferences is an important component of Sustainability in Higher Education.

External Funding Opportunities

It is imperative that Westfield State College pursue as many external funding sources as possible in order to secure the financial resources needed to promote Sustainability in Higher Education. These efforts should be organized and coordinated by the Campus Sustainability Coordinator, in close collaboration with the Presidents Office and the Development/Foundations Office.

A listing of possible external funding sources is provided in Appendix 6. The Association for the Advancement of Sustainability in Higher Education (AASHE) also provides useful information[86] on funding mechanisms and sources for campus sustainability.

Internal Grant Program

At the same time that we seek external source of funding, it is important that Westfield State College creates a meaningful and effective internal grant program to inspire sustainability leadership across the campus with a focus on sustainability actions initiated by campus student groups. This program can be modeled after the successful *'Environmental Council Grants'* at Middlebury College[87] and should be organized and administered by the Campus Sustainability Coordinator.

Meetings, Conferences, and Workshops

Finally, it is also imperative that Westfield State College students, faculty, and staff actively participate in local, regional, and national meetings about Sustainability in Higher Education. This supports two complementary causes:

[86] http://www.aashe.org/resources/funding.php
[87] http://www.middlebury.edu/administration/enviro/ec/grants/

1. It educates the college community by *'training the trainer'*.
2. It increases the visibility of Westfield State College as an active contributor to Sustainability in Higher Education.

Students, faculty, and staff have hosted, attended, or are scheduled to attend the following meetings, conferences, and workshops:

Plastics in the Food Chain (Keene, NH, April 2008)
Presented by Tamara Adkins
Topics: Why bisphenol-A (e.g. Nalgene and baby bottles), phthalates, and PVC are making headlines, and how to get plastic out of your diet. Where plastics end up when they are thrown *'away'* and how to find and budget for plastic-free alternatives.

Food and Climate Change: How Buying Local Food Can Make a Difference (Keene, NH, April 2008)
Presented by Katie Stoner
Topics: Why eating local is really beneficial for reducing carbon outputs and how, when compared to the Earthbound organic agri-business CO2 outputs, the difference is clear.

Sustainable Living Workshop: Solar Energy, Energy Conservation and You (Keene, NH, April 2008)
Presented by Valerie Piedmont and Pablo Fleischmann (Green Energy Options/GEO Solar Store and founders of The Sustainability Project)
Topics: Practical ideas for the home and hearth. Energy conservation, solar electric and solar hot water systems, heating alternatives, rainwater collection, composting, and edible forest gardening.

Strategies for Shaping a Sustainable Future / Brown is Green (Providence, RI, April 2008)
Brown University BIG Initiative[88]

Leveraging Change: Higher Education in a Sustainable Future (Westfield, MA, April 2008)
Presented by Dr. Anthony Cortese[89]
The impact that Higher Education could have if it incorporated sustainability principles and practices into every facet of its existence.

Climate Change & Westfield: The Health of our Residents, the Health of our Economy, and the Health of our Region – An Inconvenient Truth? (Westfield, MA, April 2008)
Presented by Andrea N. Chasen, Carsten Braun, and Ali Salehi.
A presentation of Al Gore's Climate Project[90] combined with a discussion of local and regional impacts of climate change[91].

AASHE Sustainability Across the Curriculum Leadership Workshop (San Diego State University, San Diego, CA, June 2008)
This workshop[92] is focused on developing curriculum change programs around sustainability on college campuses.

[88] http://www.brown.edu/Departments/Brown_Is_Green/
[89] http://www.secondnature.org/
[90] http://www.theclimateproject.org/
[91] http://www.climatechoices.org/ne/index.html
[92] http://www.aashe.org/profdev/curriculum.php

ACUPCC Climate Leadership Summit (Grand Rapid, MI, June 2008)
The 2008 Climate Leadership Summit[93] will feature inspiring speakers, provide action-oriented information to combat climate issues, and unite forward-thinking campus leaders committed to transitioning from good intentions to strategic transformative action.

AASHE 2nd Biennial Conference (Raleigh, NC, November 2008)
This conference[94] brings together every sector of higher education under the slogan: Working Together for Sustainability – On Campus and Beyond.

4.3) Campus Operations: Institutional Practices and Capital Projects

Campus facilities and operations may be the most obvious part of Westfield State College to enhance our environmental practices and initiate new sustainability measures, focused on the operational side of Sustainability in Higher Education (cf. Section 1.4).

4.3.1) Impacting the Environment

There are many routine activities at Westfield State College that impact the environment. The college employs over 500 faculty and staff that typically drive to the college Monday through Friday during the academic year. Additionally, there are over 2,000 commuter students including under-graduate day and Continuing Education students. The College burns over 700,000 gallons of fuel oil in addition to natural gas and electricity consumption during the year. The college generates a small amount of bio-waste or 'red-bag material' from the Departments of Athletics, Health Services, and Environmental Services. In the Dining Commons and food venues on campus the waste and energy stream includes: food, packaging, trash, chemicals for cleaning, degreasing, and consumption of energy.

Facilities staff annually applies pesticides and fertilizers to the 180 acres of landscaped property. During the winter months salt and sand has been used on the many roads, parking lots, and walk-ways. The college also produces grounds maintenance waste such as grass clippings, pruning materials, sweeping, etc. Building maintenance efforts involve the use of chemicals for hygiene practices, batteries and their corrosive parts, water consumption, volatile organic compounds, and a large generation point for solid waste.

Offices and classrooms typically generate waste streams including paper, inks, cartridges, lamps, and solid waste. Universal Waste also includes computer equipment, monitors, and audio visual equipment with recyclable components. Chemistry and Biology labs produce chemical and hazardous waste throughout the academic year. Fume-hoods exhaust out to the ambient air all chemical vapors from chemical use and experiments. In addition to the chemical waste, biological and animal waste become part of the waste stream along with waste solvents, mineral spirits, paints, acrylic and cadmium, clays, silicone glazes, and acids produced by the Art Department.

Westfield State College has been examining the impact to determine cost effective strategies to address the elimination of toxic gas emissions, increase recycling, and reduce the use of fossil fuel on the campus.

[93] http://www.presidentsclimatecommitment.org/summit/index.html
[94] http://www.aashe.org/conf2008/

4.3.2) Westfield State College Operating Costs

College operational costs are regularly tracked as part of the formula funding process for higher education as established by the Commonwealth of Massachusetts Board of Higher Education. Westfield State College purchases oil and gasoline from state contracts and electricity and natural gas from the local municipal gas and electric company[95].

Under Commonwealth of Massachusetts deregulation laws, the college is not allowed to shop for the best price for electricity and natural gas and must purchase from the municipal supplier. The college also is not entitled to any energy conservation funds offered by the local municipal electric company because municipal electric companies are exempt from participating in the rebate program.

To better track the use of utilities on the campus, the college has recently installed steam and electric meters in many of its buildings. The purpose of the meters will be to better monitor the use of energy and hopefully reduce costs by developing methods and programs to reduce energy consumption during off-peak hours.

Westfield State College has one of the largest student residential populations of all colleges in the state college system. The average residential population is 2,400 to 2,600 students that are housed in nine residence halls varying in population from 280 students to 441 students. This is a major factor that influences the use of energy on the campus.

The following table (Table 1) outlines college utility and solid waste costs for fiscal year 2007.

ITEM	VOLUME	COST (US$)
Water	41,513,000 gallons	86,346
Sewer	33,137,000 gallons	129,898
Electricity	13,988,125 KWh	1,678,575
#4 Fuel Oil	16,441 barrels	1,122,124
#2 Diesel	61,442 gallons	119,197
Natural Gas	63,760 ccf	114,131
Solid Waste Disposal		137,415.10
Gasoline	32,402 gallons	74,200
Diesel Fuel (Vehicles)	4,391 gallons	11,064
Propane Gas	0 gallons	0

An energy efficiency audit is currently underway of most buildings on campus to ascertain the costs and potential savings associated with possible energy efficiency measures, such as occupancy sensors (cf. Section 4.3.6).

4.3.3) Westfield State College Greenhouse Gas Inventory

Westfield State College has contracted Shaw Environmental, Inc. of Boston to assist the college in identifying all activities and sources of air pollution that contribute to greenhouse warming. This is the first step to reducing sources of air pollution on the campus. Power plant emissions, number of automobile trips to and from campus, air travel, bus travel, athletic travel, and the number of visitors to the campus will be determined.

[95] Westfield Gas & Electric: http://www.wgeld.org/

Once the college has the required data, Shaw staff will assist the college in developing a report that will annually show the effect of such factors on the climate. By developing a baseline, it is then hoped that the college can find ways to reduce the footprint through planning and other sustainable practices.

Shaw Environmental[96] has a long history in providing Greenhouse Gas (GHG) consulting services, as part of a group that set up the first Carbon Bank, an emission trading entity dealing with greenhouse gas emissions. Shaw is a member of the Chicago Climate Exchange and, as such, has committed to reduce its own emissions by 1 percent per year. Shaw is also a member of Sepia's Landfill Methane Outreach Program. Shaw has extensive experience in estimating greenhouse gas emissions from industrial activities. Many States (such as WV, NJ, OH) require calculation of greenhouse gas emissions for utility and other industrial operations to be reported to update the baseline data. Shaw has an extensive private and public client list that use their services to meet state requirements.

This greenhouse gas inventory (estimated date of completion: 09/2008) is a requirement under the ACUPCC (cf. Section 1.3.2) and a pre-requisite for compliance with Executive Order No. 484 (cf. Section 1.3.1).

4.3.4) Active Environmental Measures at Westfield State College

Westfield State College is working hard to comply with Governor Patrick's Executive Order No. 484 (cf. Section 1.3.1) and the goals set forth by the American Colleges and University President's Climate Commitment (ACUPCC, cf. Section 1.3.2). Westfield State College students, faculty, and staff have been actively working to increase sensitivity toward conservation, environmental and sustainability related issues.

The college, with the support of the President and Board of Trustees has instituted the below listed policies, initiatives, and procedures to enhance the campus sustainability.

Transportation

- Westfield State College encourages faculty and students to participate in a ride-share program.
- The college offers students, faculty, and staff the opportunity to take public transportation by providing free/reduced rate bus transportation through the Pioneer Valley Transit Authority[97] (cf. Section 5.3).
- The college offers special car-pooling parking spaces.
- The college offers a shuttle service between college buildings and parking lots.
- The college is working on a program to encourage the use of bicycles on the campus and surrounding area by students and staff.
- The college began to replace college leased fleet vehicles with hybrids to cut down on both the consumption of fossil fuel and emissions in FY 2008. In FY 2009, the college will continue to replace feet vehicles by leasing an additional three hybrid vehicles.
- Campus-fleet vehicles use bio-diesel.

[96] http://www.shawgrp.com/markets/envservices/sustsols
[97] http://www.pvta.com/

Oil Recovery Project

Westfield State College is actively working to recover fuel oil in the ground as a result of leaking oil tanks found in 1991. To date the college has recovered over 35,000 gallons of number four fuel oil at a growing cost of over $600,000. This project is considered to be a highly successful model for the extraction of oil in the ground. The process uses high-pressure steam to liquefy the free product enabling the vacuum to expedite extraction.

Grounds Applications

- Westfield State College is using a bio-degradable brewery waste product to pre-treat roads and sidewalks as part of its winter snow removal procedures.
- The college continues to purchase plants indigenous to Western Massachusetts.
- The college has actively pursued a policy to reintroduce endangered species of trees on the campus by planting elm, chestnut, maple, and black walnut trees on the grounds.
- The college maintains a composting system for recycling grounds materials such as grass clippings and leaves.
- The Facilities and Operations Department recently bid a contract for fertilizer requesting environmentally friendly blends and is hoping for positive bid results.

Recycling Program

Westfield State College actively recycles the following materials: cardboard, mixed paper, plastics, glass, cans, solvents, hand-held electronics, inkjet and laser printer cartridges, office copiers, fluorescent tubes and light bulbs, ballasts, batteries, oil, computers, aerosol cans, paint, Freon, metals, furniture asphalt, and concrete. The college is a member and works closely with the Institutional Recycling Network[98] to improve recycling efforts on campus.

Purchasing

- Westfield State College is a past recipient of the Massachusetts Buy Recycled Products College and University Award.
- The college purchases paper products with 20 percent post consumer content for use in the main copy center.
- The college routinely purchases ENERGY STAR certified appliances[99] and electronics whenever possible[100].
- The college encourages the purchase of environmentally friendly product and products with post consumer content.

Facility Construction and Renovation

Westfield State College attempts to follow LEED Guidelines[101] whenever possible in the renovation and construction of college facilities. The college actively works with the Division of Capital Asset Management (DCAM) Office of Sustainability[102] on construction projects to brainstorm conservation measures that can be incorporated into building design.

The college has been purchasing roofing systems for college buildings that reflect sunlight. Presently every state owned building with the exception of Parenzo Hall has this roofing system.

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[98] http://www.ir-network.com/
[99] http://www.energystar.gov/
[100] This sustainable purchasing practice is one of the seven tangible actions included by the ACUPCC (cf. Appendix 9).
[101] http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222
[102] http://www.mass.gov/cam/about/ov_who.html

The replacement of the Parenzo Hall roof is presently out to bid and this type of roofing system is being bid to replace the existing roof.

Environmental Services

Westfield State College purchases green cleaning products and products made with post consumer material such as paper towels and trash bags and has developed and uses an integrated pest management program throughout the campus. The college purchases cleaning and floor care machinery that reduces water consumption.

A program to recharge batteries on powered equipment and hand-held tools is also in place. The college has developed and implemented a plan to separate and recycle waste from college residence halls at the beginning and end of the academic year when volume is high.

Renewable Energy Initiatives

Westfield State College, in cooperation with the Massachusetts Executive Office of Environmental Affairs[103] and the Massachusetts Technology Council[104] has completed a survey of campus building roofs for the future installation of photovoltaic systems. The college has several roofs that will provide suitable sites and is investigating grant funding to assist with the cost of installation.

The college has also had a wind survey conducted to determine if the college is a viable site for wind technology systems. Unfortunately, it has been determined that the college lies in an area which does not have suitable sustained winds for this type of technology. The Facilities and Operations Department is also looking into steam turbine technology and Fuel Cell technology as other possible sources of clean energy.

Academic Initiatives

Westfield State College Science Departments and Office of Environmental Health and Safety are actively pursuing policies and procedures to reduce chemical use in laboratories. Laboratory professionals are auditing their respective waste profiles and seeking alternatives to minimize hazardous waste generation.

The Biology and Chemistry Departments are actively incorporating micro-scale experiments in laboratories. The college has closed traditional photography laboratories in favor of digital photography reducing chemical and silver waste recycling needs.

Information Technology

Westfield State College has designed information systems that allow for campus-wide electronic correspondence which has reduced the amount of paper consumption on the campus. The IT Department only purchases green energy efficient computers and processors. Other sustainability measures currently deployed include:

- Automatic nightly shutdown sequence that turns off lab computers, classroom podium computers, and projectors at designated times (11:00pm to 06:00am).
- Replacement of regular laser printers in computer labs with multi-function devices to lower printing costs and enable double-sided printing.

[103] http://www.mass.gov/envir/
[104] http://www.mhtc.org/

Nevertheless, it is very likely that energy consumption associated with information technology will continue to increase as the IT Department continues to expand their services, for example by providing comprehensive wireless access on and around campus.

4.3.5) Management Practices at Westfield State College

Solid Waste

In fiscal year 2004, Westfield State College spent $119,364 on non-hazardous waste disposal generated on the campus. On average, the college recycled 10,800 pounds of mixed paper per collection. The college also recycles batteries, fluorescent tubes and light bulbs, cardboard, glass, metal, small and large electronic devices, computers, monitors, and Freon gas.

In an effort to recycle yard and grounds waste (e.g. leaves, pine needles, small branches, etc.) the college operates a composting system. Grounds waste is collected and composted for use on the campus to enrich gardens. The college has reduced the use of sand on winter roads by adopting a system that uses by products from the brewing process. Any road and parking lot sweepings are recycled by the street sweeping contractor.

The college also has put a recycling program in place for the recycling of ABCD construction waste to comply with recent changes in state law. The college has also been the recipient of several grants from the Commonwealth of Massachusetts Office of Environmental Affairs. One such grant has allowed the college to establish a site compactor for cardboard waste.

The college routinely recycles old doors and furniture as well as other waste on the campus. This summer the college will be using the network to recycle several buildings worth of dormitory furniture. Wherever possible, usable items are recycled by donating them to local, state, and federal organizations and developing countries.

Product Procurement and Services

Westfield State College has been a leader in the purchasing of recycled materials for many years. In 1997, the college was awarded the Commonwealth of Massachusetts Buy Recycled Award for the Best University Program. The college continues to purchase Environmentally Preferable Products (EPPs) wherever possible. Products purchased by the college include paper, plastic bags, road maintenance and snow removal products, green labeled electronics, computers, green labeled large appliances, plastic, lumber, cleaning supplies, picnic table, benches, and equipment made with post-consumer content. The college has also begun to purchase environmentally friendly paint.

For the past several years, the Facilities and Operations Department has been purchasing biodiesel for use on campus to fuel college-owned diesel powered vehicles. The college continues to lobby for a contract and continuous supply of biodiesel for use to power boilers in college buildings. It is hoped that the state will have a reliable supplier by the fall of 2009.

The college fleet of vehicles is being converted gasoline powered vehicles to hybrid vehicles. The college presently leases two hybrid vehicles and plans on leasing three more in FY 2009 bringing the total to five vehicles. The president's car is also a hybrid vehicle as well.

The college also reviews architectural designs to be used in new construction and renovation projects in an attempt to include products and systems that will either contain post consumer products or will comply with standards contained in state sustainability guidelines.

Community Support of Environmental and Sustainability Initiatives

Westfield State College actively supports community conservation and sustainability initiatives. The college has been a past site for the National Sustainable Energy Alliance Annual Conference. The college has also sponsored the annual Westfield River Watershed Association[105] that highlights community efforts to conserve the natural resources that border the first nationally designated green river in Massachusetts. Many faculty members serve as members of the Westfield River Alliance that oversees efforts to preserve the river.

Student organizations annually sponsor a variety of activities to preserve the environment including river and roadside trash pickups. The college MASSPIRG[106] organization also sponsors other workshops on the environment. This past year the organization worked on a clean water initiative that sponsored speakers and events that highlighted the need to conserve water and stop pollution.

The college also participated in a pilot program with EPA Region I and the Partnership for Environmental Technical Education to test WAVE Saver Water Management Software that would allow institutions to monitor water conservation efforts and develop plans and programs to conserve water. As part of the program, the college also worked with the Conway, Massachusetts Elementary School to show them how the software could be used for conservation efforts at the school.

In 2007, the Westfield State College signed on to the ACUPCC (cf. Section 1.3.2) to help reduce carbon emissions and other dangerous gases being emitted into the environment.

Hazardous Waste

Westfield State College is designated a SQG (Small Quantity Generator) with EPA and overall generates a waste stream from the Science laboratories, the Art Department, and from the Facilities and Operations maintenance efforts.

Typical waste profiles include spent solvents, chemicals, waste oil, paints, aerosols, and the recyclables common to a campus environment such as fluorescent lamps and computer hardware. Not unlike other older buildings within the Commonwealth, the college spends a significant amount of money on asbestos and lead abatements during the course of repairs and renovations. The hazardous waste transport services cost the college approximately $25,000 to $30,000 annually, not including abatement projects.

Universal Waste

The college maintains membership in the Institutional Recycling Network[107]. The college recycles thousands of pounds of computer hardware and thousands of linear feet of fluorescent lamps. The college continues to replace mercury thermometers with alcohol alternatives wherever possible. A typical transport could include 7,100 lbs of metal, plastic and glass, computer, housing, and peripheral equipment. Annual expenditures for universal waste transports average between $5,000 and $10,000.

[105] http://www.westfieldriver.org/index.html
[106] http://www.masspirg.org/
[107] http://www.ir-network.com/

4.3.6) Commitment Toward Sustainable Practices

Sustainability is not cheap and requires a concerted effort on the part of the entire college community.

At Westfield State College, we believe environmental sustainability is achievable by making best management practices clear and attainable. The college hopes to design and refine a living plan that will provide direction and inspire innovation.

New directives are continually forthcoming and the college must be in a receptive mode to anticipate change. Enhancements to the facilities come at a cost which is borne by the college to maintain and further the initiatives set forth in this document. Support for these efforts must be available not only in terms of funding, but also in providing trained support staff that understands the importance of environmental responsibility. It is further understood that public opinion is imperative to the success of the institution and that any improved commitment and performance on the campus is measurable. The implementation of a successful environmental management plan that stresses sustainability and the protection of natural resources is a tremendous tool for the campus and the surrounding community.

We as a community must work together to minimize the impact on the environment by nature of what we do and to strive for better ways to pursue our own immediate and long-term goals.

Future Goals

Westfield State College, in order to meet the goals of both Executive Order No. 484 (cf. Section 1.3.1) and the ACUPCC (cf. Section 1.3.2), has to allocate funding needed to implement many strategies that will provide significant results to lower greenhouse gas emissions and improve all aspects of sustainability and green practices on the campus.

Some of these major expenditures will include (cf. Section 5.4):

- Replacement of single pane windows.
- Installation of lighting occupancy sensors in all campus buildings.
- Repairs to HVAC systems.
- Purchase of hybrid vehicles.
- Purchase of green products.
- Upgrading of campus recycling bins.
- Power plant emission reduction upgrades.
- Electricity and water conservation measures.

Top-Two Short-Term Recommendations

- Replacement of halogen lighting in the Parenzo Gym, Racquetball Court, Juniper Park Gym, and Ely Indoor Pool with high-efficiency fluorescent bulbs. Estimated cost: ~$400,000, estimated payback time: ~8 to 10 years (more robust numbers are pending).
- Installation of 40 occupancy sensors (received through a state grant) in Bates Hall (as a case study). Order of installation: public spaces, general purpose class rooms, offices.

Longer-Term Initiatives

- Development of a new 10-year plan for energy savings initiatives in collaboration with the Division of Capital Assets Management.
- Replacement of old heating plant boilers with new energy-efficient boilers.
- Installation of occupancy sensors in all campus buildings.
- Reduction of oil consumption by optimizing the control system for each campus building.

4.4) Sustainability in the Curriculum

Part of the role of Westfield State College is to educate all constituents of the campus community about the impact of environmental issues on the world as well as what can be done both individually and collectively. We are educating future leaders. These leaders need technical and scientific information about the problems that confront us today. They need problem solving skills to make decisions about the future of the world. They need the awareness of their place in the spectrum of life that is around us.

Westfield State College can offer all of that. Through course work, students can learn the information and the skills needed to help lead this country and world into a future that exists. The college can also serve as a forum for discussions on the connection of sustainability issues to social justice.

As we look at the role of the curriculum in providing what students need in order to be such leaders, it is important to look at infusing sustainability issues in existing courses, creating new courses, providing extracurricular activities for faculty, staff, and students and providing the deep discourse about these issues that will ultimately change the culture of the campus and ultimately the world.

The ACUPCC (cf. Section 1.3.2) contains a series of requirements and recommendations[108] to make sustainability an integral part of the curriculum and educational experience for all students, for example[109]:

- Cataloging the institution's current educational offerings (both curricular and extra-curricular) related to climate change and sustainability.
- Initiation of faculty development workshops on climate change and sustainability.
- Creation of new academic programs related to climate change and sustainability.
- Establishment of a graduation requirement in sustainability.
- Development of institution-wide incentives or programs to encourage faculty to collaborate across departments/disciplines to address sustainability in their courses.
- Participation in climate-related educational initiatives like Focus the Nation[110].
- Inclusion of students on building and construction, operations, and facilities committees.
- Implementation of student life educational initiatives related to climate change and sustainability, such as: peer-to-peer outreach and education efforts like *'Eco-*

[108] At the same time, the ACUPCC acknowledges that these actions will be specific to each institution.
[109] http://www.presidentsclimatecommitment.org/html/solutions_academics.php
[110] http://www.focusthenation.org/

Rep' programs; sustainability pledge programs (e.g. Graduation Pledge or Harvard Campus Sustainability Pledge); First Year Experience and/or New Student Orientation sustainability sessions; sustainability themed housing; and sustainability competitions between residence halls (cf. Section 4.6).

4.4.1) What Are We Doing Now?

Westfield State College has taken the first steps in educating these future leaders about the issues that confront us all. We currently have two degree programs. We have opened the Westfield River Environmental Center. Sustainability issues have been infused into courses in multiple departments throughout the college. In addition to the course work, many professors are infusing sustainable practices in their courses. The campus has also hosted a number of forums outside the classroom for people to learn about sustainable issues.

1. Current Degree Programs

Westfield State College currently offers two degree programs that represent the traditional core of sustainability: Environmental Science and Regional Planning. Both programs are ideally positioned to support a new interdisciplinary Sustainability major (cf. Section 4.4.2).

Environmental Science Major

Westfield State College has established an interdisciplinary and inter-college Environmental Science major[111] that emphasizes the interdependence of the natural and social sciences:

> *"Upon completion of this major, students will be able to identify and understand the major components of social systems and the natural environment, and how these components interact. Graduates will be prepared to enter the rapidly expanding environmental field with careers in the public and private sectors. Employment opportunities exist in industries concerned about pollutants and toxic waste by-products of their own manufacturing procedures, or among companies specializing in solid and toxic waste management, methods of pollution abatement, or groundwater testing and cleanup. Other employment opportunities include local, state, or federal government agencies engaged in development planning or monitoring compliance with environmental laws, or with monitoring air, groundwater, or surface water quality."*

Regional Planning Major

The Geography and Regional Planning Department[112] at Westfield State College offers the only Bachelor of Science Degree in Regional Planning at a state institution in New England by providing a strong planning education that includes a foundation in physical and social geography as well as pragmatic techniques to solve planning and environmental problems related to sustainability and sustainable development.

Regional planners develop and implement programs that provide for sustainable growth and revitalization of communities ranging from small towns to the state and federal levels:

> *"Present and future land use planning greatly affects the magnitude of the impacts of climate change on all infrastructure systems…In general, the threat of climate change reinforces the importance of good land use planning and in*

[111] http://www.wsc.ma.edu/environmentalscience/
[112] http://www.wsc.ma.edu/garp/index.html

particular, planning or lack thereof should certainly not increase present vulnerabilities…For this reason, land use planning may hold the greatest potential for adaptation policy."[113]

2. The Westfield River Environmental Center

The Westfield River Environmental Center was established in 2005 by an interdisciplinary group of faculty and administrators with the goal to promote environmental research, community partnerships, GIS, and K-12 science education in the watershed of the Westfield River. Some of the current activities include:

- Mapping and identifying river habitats, effects of small dams on salmon habitat temperatures, mapping the spread of the invasive Hemlock Woolly Adelgid, and studying the spread of invasive Phramites in local wetlands.
- The Environmental Center maintains strong partnerships with a wide variety of environmental and community organizations throughout the watershed. Students are currently in internship programs with the Nature Conservancy[114], The Trustees of the Reservation[115], and the Westfield River Watershed Association[116].
- The K-12 science education component of the Environmental Center is aimed at helping local science teachers incorporate environmental science into their science curriculum.

3. Infusing Sustainability Issues throughout the Curriculum - Current Course Offering at Westfield State College

Sustainability issues have been infused in courses in multiple departments throughout the college. As sustainability is tied to all aspect of the curriculum, it is not surprising that we find such work in many courses. (cf. Appendix 7, compiled from an informal email survey in April 2008).

4. Sustainable Practices in the Classroom

- Some professors are attempting to reduce or eliminate paper in their courses. Students can submit assignments electronically. All course assignments and the syllabus are on the course website. Articles to be read are presented electronically.
- In art classes, one professor is expanding into using UV or Sun etching plates that require only UV light and water to develop the image in an intaglio plate. This will eliminate the use of acids and other toxic materials. She is also switching to water soluble inks for intaglio printmaking and using vegetable oil for cleaning oil base inks rather than solvents.

5. Additional Educational Opportunities

Westfield State College has offered a number of activities around sustainable issues this year. Two sustainability fairs (one in October 2007 and one in April 2008, cf. Section 4.5.2) provided students, faculty, administration, and members of the community with information about important environmental issues as well as providing alternative options for different life choices. Participants had the opportunity to measure their carbon footprint and to learn ways to change some of the things they do.

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[113] Kirshen *et al.*, 2008, Interdependencies of urban climate change impacts and adaptation strategies: a case study of Metropolitan Boston USA. Climatic Change, 86, 105-122, doi: 10.1007/s10584-007-9252-5.
[114] http://www.nature.org/
[115] http://www.thetrustees.org/
[116] http://www.westfieldriver.org/

Two speakers were brought to campus to address sustainability issues.

1. Dr. Anthony Cortese – *"Leveraging Change: Higher Education in a Sustainable Future."*
2. Andrea Chasen – *"A 'Climate Project' Presentation: Climate Change & Westfield: The Health of our Residents, the Health of our Economy, and the Health of our Region- An Inconvenient Truth?"*

4.4.2) Where Do We Need To Go From Here?

Efforts are being made to educate all constituencies about sustainability issues. Improvements need to be made to ensure that all students receive important information about the impact that climate change will have on their lives and the life of the planet. Westfield State College needs to continue to look at ways to infuse sustainability issues in existing course, to envision new courses or programs for students, and to expand the extracurricular activities that focus on sustainability issues. Students and faculty need to have the opportunity to have deep discussions about these issues.

Westfield State College has to support faculty engaged in sustainability-related curriculum development, especially at the international level, with appropriate release time and funding. The same applies to faculty research on sustainability issues.

Westfield State College should explore the idea of creating a Center for the Study of Sustainability Issues[117]. This center could serve as a clearinghouse of resources for the college, the region, the state and the nation. It could serve as an informational center conducting workshops, seminars, and conferences. It could be a collaborating partner in helping to design curriculum.

The Infusion of Sustainability Issues in existing Courses

Sustainability issues can be infused into coursework in every department on campus. Each department on campus should discuss ways that they can infuse sustainability issues into existing courses. For example:

- In Education courses, students can focus on ways to teach about environmental issues in elementary schools.
- Economics and Business courses can focus on green business.
- Communication courses can focus on the importance of the media to help solve these problems.
- Political Science courses can focus on issues of policy and equity.
- Sustainability issues can be included in the First-Year Experience courses.
- Sustainability issues and questions are ideally suited for independent studies, honors projects[118], and collaborative learning environments (cf. Section 3.8).

It is not just the content that is important. It is also important that problem solving, reasoning, and decision making skills be taught. In addition, issues of social justice as they relate to sustainability issues need to be discussed.

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[117] The Global Institute of Sustainability at Arizona State University can serve as a successful example: http://sustainability.asu.edu/giosmain/index.htm

[118] http://www.wsc.ma.edu/Academics/Honors_Program/

The Creation of new Courses
Westfield State College has the opportunity to review its course offerings and develop new courses that would be responsive to sustainability issues, especially with respect to the current review of our common core curriculum.

The Creation of new Degree Programs
Westfield State College is already offering an Environmental Science and Regional Planning major (cf. Section 4.4.1). It is possible to create a concentration in sustainability issues as part of those degree programs.

It is also possible to create a new interdisciplinary sustainability major[119]. This major could include sustainability courses in the sciences, sociology, economics, business, psychology, history, geography, and communication. This new major would enable our students to benefit from the expanding *'Green Collar'* economy[120] and associated professional opportunities.

Finally, Westfield State College could offer a professional certificate program in sustainability through our Division of Graduate and Continuing Education (cf. Section 3.7).

Extracurricular Activities that focus on Sustainability Issues
In addition to the infusion of sustainability issues in existing courses, it will be important for the campus to keep these issues visible throughout the year through many events on campus. These events should include students, administration, and faculty as well as be open to community involvement.

A coordinated effort will be necessary in order to create and organize events such as:

- Brown bag lunches at the Faculty Center[121] with an interdisciplinary focus
- Workshops for faculty on Opening Day
- Lecture series speakers
- Recommendation of a sustainability-themed book for the annual Campus Book
- Residence hall activities (cf. Section 4.6)
- Freshmen orientation activities
- More Sustainability Fairs (cf. Section 4.6.2)
- Exhibits and Displays around campus
- Partner with the community to create projects

4.5) Community Service, Outreach, and Advocacy

Moving beyond the college campus, Westfield State College can be a leader and supporting partner for sustainability initiatives within the larger Westfield and Western Massachusetts community. This has, and can, take many forms from service work for environmental groups to educational programming in elementary schools, public education events on campus, and outreach activities with municipal and not-for-profit groups.

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[119] This major and professional certificate program could be modeled after similar programs at Arizona State University: http://schoolofsustainability.asu.edu/
[120] http://www.nytimes.com/2008/03/26/business/businessspecial2/26collar.html?ref=businessspecial2
http://www.businessweek.com/managing/content/jan2008/ca2008018_005632.htm
http://www.ases.org/ASES-JobsReport-Final.pdf
[121] http://www.wsc.ma.edu/facultycenter/

The students, faculty, and staff of Westfield State College are knowledgeable and energetic and with the support of the institution can continue their involvement in local and regional sustainability efforts. Such work may also include advocating for specific projects and policies, and working with others to promote the changes needed for sustainability within the entire Pioneer Valley region.

4.5.1) Active Memberships and Participation in Local/Regional/State-wide Organizations related to Sustainability and Environmental Protection

Westfield State College is an active member of the following organizations:

- Pioneer Valley Sustainability Network[122]
- City of Westfield Recycling Program[123]
- Association for the Advancement of Sustainability in Higher Education (AASHE)[124]
- American College and University Presidents Climate Commitment[125] (ACUPCC)
- New England Sustainability Association[126] (Greenfield, MA)
- Association of University Leaders for Sustainable Future[127] (ULSF)
- Massachusetts Clean Energy Center
- New England Clean Energy Council[128]

Through the Westfield River Environmental Center (cf. Section 4.4.1) and other college groups, departments, and individuals, Westfield State College has an active presence in the following environmental organizations:

- Westfield River Watershed Association[129] and Annual Westfield River Symposium[130] (held at Westfield State College)
- Westfield Wild And Scenic River Advisory Council[131]
- Municipal Tree Initiative in Westfield
- The Stanley Park of Westfield[132]
- Springfield Naturalists' Club[133]

The K-12 education internships completed by Westfield State College students at Juniper Park School, Westfield Middle School, Westfield High School, and others have been used to bring the message of recycling and a general ecological awareness through curriculum, lessons, and projects. In addition, Westfield State College faculty members frequently visit local schools to share their scientific and educational expertise.

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[122] http://www.pvsustain.com/
[123] http://www.cityofwestfield.org/detpages/departments177.html
[124] http://www.aashe.org/index.php
[125] http://www.presidentsclimatecommitment.org/
[126] http://www.nesea.org/
[127] http://www.ulsf.org/
[128] http://www.cleanenergycouncil.org/
[129] http://www.westfieldriver.org/
[130] http://www.westfieldriver.org/symposium.html
[131] http://www.mass.gov/dfwele/river/programs/wildandscenic/index.htm
[132] http://www.stanleypark.org/
[133] http://www.naturalist-club.org/

4.5.2) Community – College Programming

On October 24, 2007[134] and April 1, 2008 Westfield State College sponsored *'Green Fairs'* or Sustainability Fairs where local organizations, eco-related vendors, and the public were invited to campus. A variety of activities were available during these events including:

- Pledging sustainable practices
- Calculating ecological footprints
- Riding Segways[135]
- Learning about eco-friendly cleaning products
- Getting expert eco-friendly gardening tips
- Learning about the activities of environmental groups
- Seeing renewable energy technology
- The opportunity to purchase local products such as eggs and maple syrup

Figure 8. Campus Sustainability Day (10/24/2007)[136].
Pictured are Trudy Knowles (Education Department) and Robert Thompson (Biology Department).

[134] http://www.scup.org/blog/csd/2007/10/westfield-states-green-fair.html
[135] http://www.segway.com/
[136] http://www.scup.org/blog/csd/uploaded_images/Think-green.-762801.JPG

Figure 9. Campus Sustainability Day (10/24/2007).
Re-useable shopping bags and water bottles[137].

Figure 10. Campus Sustainability Day (10/24/2007).
Visitors were encouraged to commit to a sustainable action in their own lives[138].

[137] http://www.scup.org/blog/csd/uploaded_images/Give-aways--reuseable-bags-and-bottles-718495.JPG
[138] http://www.scup.org/blog/csd/uploaded_images/Pledges-741970.JPG

Figure 11. Climate Change and Westfield Event Poster (04/01/2008). This event also included a Green Resource Fair.

Also featured on April 1, 2008 was a public evening presentation (Fig. 11) on climate change by a panel including a local representative of Al Gore's Climate Project[139], a Westfield State College faculty member from the Geography and Regional Planning Department, and a representative from a local eco-friendly manufacturer[140].

The October 2007 Westfield State College Alumni Day featured a presentation on *'Climate Change and Planning Responses'* by two faculty members of the Geography and Regional Planning Department.

4.5.3) Enhancing Community Interactions around Sustainability

- Make Westfield State College's faculty resources on sustainability accessible to public and not-for-profit groups. This can be encouraged by creating a 'specialty on sustainability' related theme or improved *'Experts List'*[141] within the college speaker bureau – identifying faculty with expertise in sustainability issues (e.g.

[139] http://www.theclimateproject.org/
[140] http://www.columbiamfginc.com/
[141] http://www.wsc.ma.edu/experts/index.html

climate change, sustainable practices, teaching sustainability, the economics of going green, environmental cost of energy consumption, renewable energy, etc.) and promoting these speakers and experts to interested community groups and alumni.

- Expand the K-12 student-led teaching activities that have sustainability related themes. This could include: science projects (e.g. grow your own organic food, class field trips to sustainable organizations, etc.) and teaching about sustainability (e.g. the waste stream[142] and consumerism, etc.).
- Continue to expand the annual *'Green Fair'* (cf. Section 4.5.2) with more local representatives and greater public involvement. This event should be scheduled to coincide with Earth Day[143] (April 22 each year).
- Expand educational programming on campus in partnership with local groups interested in sustainability themes. The April 1, 2008 evening event, for example, was initiated by a group of local business people.
- Maintain an active presence in local, regional, and higher education sustainability organizations by attending meetings and conferences on a regular basis and sponsoring student participation. When the Campus Sustainability Coordinator (cf. Section 4.2.1) is unavailable an alternative representative should be sent.
- Expand the successful *'Passport to Adventure'* Program[144] at Westfield State College to include sustainability programs.
- Use the Westfield State College International Education Program to make connections with projects in the developing world, such as tree planting, where students could design, construct and monitor the effort.
  Such projects could also play a role in offsetting some of Westfield State College's greenhouse gas emissions (cf. Section 4.7). These projects and study-abroad semesters can serve as opportunities to gather information on best practice with regard to sustainability in other parts of the world.
- Enhance active advocacy for sustainable projects, initiatives, and legislation at the local, regional, national, and international level.

4.6) Campus and Residential Life

While Facilities and Operations (cf. Section 4.3) is responsible for maintaining the dormitories that house over 2,500 students at Westfield State College, Residential Life[145], within the division of Student Affairs, provides staffing and programming.

4.6.1) Current Activities

During the 2007-2008 academic year, Residential Life initiated several sustainability themed activities with plans for more in the upcoming year.

A group of students formed a *'Green Team'* and launched a campaign on reducing food waste on campus. This group participated in the spring 2008 Green Fair (April 1, 2008) passing out information and soliciting new members. The Green Team also designed a survey on recycling aimed at assessing student attitudes and current practices. All Westfield State College students

[142] http://www.storyofstuff.com/
[143] http://www.earthday.gov/, http://ww2.earthday.net/
[144] http://www.wsc.ma.edu/Academics/Passport_To_Adventure/Passport_To_Adventure.html
[145] http://www.wsc.ma.edu/dept/reslife/

were invited through an email to take the on-line survey. Results are being tabulated and should be available in late May 2008.

The Green Team intends to use the results to formulate recommendations on how to increase student participation in recycling, and would like to expand the survey to cover the rest of the campus community. This group has already communicated some concerns about recycling containers to building maintainers.

In the fall of 2008, a portion of Davis Hall will be designated a Sustainable Living Area (cf. Section 5.3, Appendix 9). This section will feature speakers on sustainability, sustainability service projects, and strive for sustainable practices in all functions. The Resident Advisor and Resident Director for this area are committed to this initiative and have support from Residential Life for instituting changes. The Green Dorm initiative is very new and it is anticipated that in the course of the year the students will develop additional ideas for living 'green' and sustainable on campus.

Figure 12. http://www.res.wsc.ma.edu/

4.6.2) Recommendations for Future Activities

Sustainability efforts at Westfield State College, especially with respect to recycling on campus (i.e. academic buildings, residence halls, athletic events, etc.), can only be successful if they are embraced by the student population.

- Through the Green Team participate in the successful national student competition *'RecycleMania'* (an option under the ACUPCC commitment, cf. Section 5.3 and Appendix 9). This event consists of a 10-week contest between colleges and universities to see which institution can collect the largest amount of recyclables per capita.
- Provide funding for students in the Green Team to continue and expand their activities and attend relevant conferences and training (cf. Section 4.2.5).

- Establishment of an Eco-Rep program[146] in the residence halls for peer-outreach and education. This program can be modeled after the very successful Eco-Rep program at the University of Vermont[147] (Burlington, VT):

  By promoting environmentally responsible behaviors in University of Vermont residence halls, the Eco-Reps Program strives to create an environmentally literate student population and reduce the campus' ecological footprint.

  Specific activities at UVM include[148]:
  - Set up an Eco-Bulletin board in their residence hall and post information.
  - Conduct audits of the trash and recycling bins in their building.
  - Go door to door, talking to students about sustainability.
  - Conduct energy audits of light bulbs and appliances in residence halls.
  - Conduct surveys about ecological issues.
  - Attend bi-weekly meetings to plan activities and provide feedback to the coordinator.
  - Set up and staff environmental information booths and exhibits.
  - Write articles about eco-topics for the student newspaper.

  At UVM, Eco-Reps are able to formalize their engagement in environmental stewardship with appropriate course credit.

4.7) Sustainability, Climate Neutrality, and Carbon Offsets

The atmosphere represents a global common[149] and it is therefore irrelevant, at least from an atmospheric physics point-of-view, where and how carbon emissions are reduced. What does matter is that we reduce carbon emissions *significantly* and *rapidly* across the globe if we want to successfully confront[150] and manage climate warming over the next several decades.

Carbon offsets[151] reduce or avoid greenhouse gas (GHG) emissions in one place in order to *'offset'* them elsewhere. The economic motive is simple: greenhouse gas emission reductions come at a wide range of costs and options, depending on geography. For example, Westfield State College is not a suitable location for wind power generation – yet we can 'reduce' or 'offset' some of our greenhouse gas emissions by paying for (part of) an alternative energy project elsewhere at a more suitable location[152]. This transaction is typically facilitated through a retail carbon offset provider.

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[146] Sustainability: The Journal of Record, 2008, 1(1), 57-72: http://www.liebertonline.com/sus
[147] http://www.uvm.edu/~ecoreps/
[148] http://www.uvm.edu/%7Eecoreps/?Page=about.html
[149] Hardin (1968) The Tragedy of the Common. Science, 162, 1243-1248.
[150] Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable: http://www.unfoundation.org/SEG/
[151] See http://www.cleanair-coolplanet.org/ConsumersGuidetoCarbonOffsets.pdf for an excellent guide to carbon offset providers, including a ranking of different providers and http://www.ucsusa.org/global_warming/solutions/cap-and-trade.html for background information on carbon trading.
[152] This more 'suitable' location could be local, regional, national, or global.

Carbon offsets are being used today by a wide range[153] of commercial companies (e.g. Ben and Jerry's, Stonyfield Farm), individuals (e.g. Al Gore), organizations (e.g. Natural Resources Defense Council), colleges (e.g. Colby College, College of the Atlantic), and universities (e.g. Colgate University, Yale University).

4.7.1) Carbon Offset Mechanics

Carbon offsetting typically begins with a comprehensive greenhouse gas emissions audit (cf. Section 4.3) and the implementation of meaningful greenhouse gas emission reduction and energy conservation measures (Fig. 13). Westfield State College then defines a desired greenhouse gas emissions reduction target and contracts with a retail carbon offset provider to purchase the appropriate quantity of carbon offsets. The exact cost per ton of carbon depends on the specific type of carbon offset and total offset volume (Table 2).

Greenhouse gas emissions and carbon offsets are reevaluated and adjusted annually as more and more energy efficiency and conservation measures are implemented on campus.

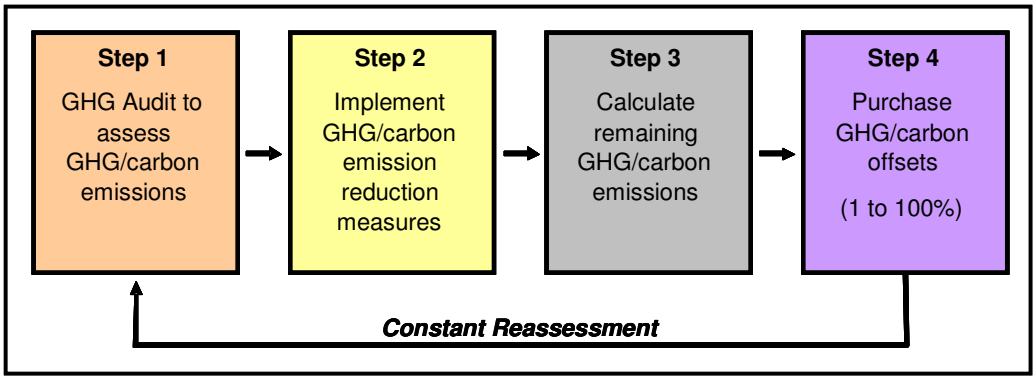

Figure 13. The mechanics of carbon offsets. The GHG/carbon emissions are constantly reevaluated in order to purchase the optimum quantity of carbon offsets to achieve the desired level of GHG/carbon emission reductions (1 to 100 percent).

4.7.2) Carbon Offsets in Higher Education

We note the following concerns and issues[154] associated with carbon offsets, especially for institutions of Higher Education:

1) The specifics of carbon offset projects and benefits are often ill-defined.
2) The carbon offset market is not adequately regulated at this time, thus the verification of the carbon offsets remains problematic.
3) Certain types of carbon offsets, such as Renewable Energy Credits (RECs), are not actual offsets of any 'new' greenhouse emissions, but rather certify that renewable energy has been produced and delivered to the electrical grid (cf. Section 5.3 and Appendix 9).
4) Carbon offset projects are often not part of the local community.

[153] Clients of www.nativeenergy.com (reputable retail carbon offset provider according to http://www.cleanair-coolplanet.org/ConsumersGuidetoCarbonOffsets.pdf)
[154] Bookhart (2008), Strategies for Carbon Neutrality. Sustainability – The Journal of Records, 1(1), 34-40. http://en.wikipedia.org/wiki/Carbon_offset

5) Carbon offsets are considered by some as only a short-term strategy, but do not represent a sustainable long-term solution.
6) Carbon offsets divert already scarce financial resources from more meaningful sustainability strategies, such as energy conservation measures and improving the overall energy efficiency of the campus (Table 2).
7) Carbon offsets are seen by some as a way of simply 'buying' our way out of our responsibility for sustainability, thus sending the wrong message to our students.

Many of the concerns and issues associated with carbon offsets can be addressed by due diligence on the part of Westfield State College and by choosing a reputable retail carbon offset provider.

For example, *The Consumer's Guide to Retail Carbon Offset Providers*[155] reviewed and ranked 35 retail carbon offset providers in December 2006. It appears very likely that carbon trading legislation will become a reality over the next few years (A. Cortese[156], pers. comm.) which will presumably provide a more robust verification and certification framework for carbon offsets.

The concern about the frequent lack of local benefits of many carbon offset projects is valid and it would seem beneficial to explore local options for meaningful carbon offset projects through collaborations with other interested groups, organizations, and institutions in Western Massachusetts and New England. On the other hand, it should be feasible to choose a suitable international carbon offset project, for example in the developing world, and incorporate this project into an international education and research curriculum through independent studies, internships, and study-abroad programs. This would give our students a more comprehensive appreciation of the global impacts and solutions associated with climate change and sustainability.

Carbon offsets, when viewed in isolation, are viable only as temporary solutions. However, when integrated into a multi-facetted, global approach to climate change mitigation (cf. Section 4.1), carbon offsets can be an effective mechanism for sustainable development. A recent study[157] by researchers from Purdue University, for example, proposed an approach termed the 'Preservation Pathway' to reduce tropical deforestation through carbon offsets purchased by industrialized counties[158].

> *"At the same time, it is unreasonable to expect good feelings alone to encourage developing nation's to undertake such commitments. Only when the value of standing forest begins to approach the value of the cleared land for a Soya plantation, one might say, is real progress on this issue likely to occur. Thus, financial incentives are a vital component of any deforestation policy, and this approach will likely require the translation of conserved forests into units of carbon such that value on the international market can be achieved."*

Carbon offsets, when viewed in isolation, may appear as a classic example of 'buying-our-way' out of our responsibilities approach. It is therefore important to put carbon offsets into the context of a multi-facetted approach to sustainability and into the context of global sustainable development: Carbon offsets can support sustainable energy projects beyond the confines of our

[155] http://www.cleanair-coolplanet.org/ConsumersGuidetoCarbonOffsets.pdf
[156] http://www.secondnature.org/
[157] http://news.uns.purdue.edu/x/2008a/080422GurneyPathway.html
[158] Gurney, K.R. and L. Raymond, 2008, Targeting deforestation rates in climate change policy: a "Preservation Pathway" approach. Carbon Balance and Management, 3(2), doi: 10.1186/1750-0680-3-2.

campus or region, effectively extending our educational and sustainability impact into much more vulnerable parts of the world.

These questions and concerns could be evaluated and discussed, for example, as part of a dedicated course about carbon trading and sustainable development.

4.7.3) Recommendations

The urgency of climate change requires immediate, meaningful greenhouse gas emission reductions[159]. This scientific reality is reflected in Governor Patrick's Executive Order No. 484 (cf. Section 1.3.1) and is consistent with at least 24 carbon emission reduction targets proposed or legislated [160] in the United States, Canada, and Europe.

Carbon offsets have an immediate positive impact and can be valuable tools within a comprehensive greenhouse gas emission reduction and energy conservation program. The additional costs for carbon offsets, when viewed relative to our carbon 'pollution' costs, are minimal (Table 2), but nevertheless consume valuable financial resources that could be used for other campus sustainability actions.

We recommend that the administration evaluate the feasibility of carbon offsets by comprehensively investigating the issue and by contacting reputable retail carbon offset providers. Colleges and universities across the country participating in successful carbon offset programs can serve as useful case studies.

The ACUPCC is currently developing a dedicated Carbon Offset Protocol to support colleges and universities in the decision-making and implementation process. In the meantime, ACUPCC provides helpful guidance and information in its implementation guide[161] and on its WWW-site[162].

Table 2 Cost estimates for retail carbon offsets purchased from Native Energy[163] (based on approximate FY 2002 direct carbon emissions, such as electricity, heating, and campus vehicles). These calculations are meant as a general cost estimate only.

Carbon Offset Amount (tons)	Percentage of FY 2002 emissions	Cost (per ton)	Cost (per year)	Percentage of emission creation cost
3,000	25%	~$10	$30,000	~0.01%
12,000	100%	~$7	$84,000	~0.027%

Notes

- A 25 percent reduction in carbon emission by FY 2012 is mandated under Executive Order No. 484 (cf. Section 1.3.1).
- A 100 percent reduction in carbon emission is required by the ultimate long-term objective (climate neutrality) of the ACUPCC (cf. Section 1.3.2).
- Westfield State College annual expenditures for electricity, natural gas, heating oil, diesel, and gasoline are about $3.1 million (FY 2007) (cf. Section 4.3.2).

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[159] http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf
[160] Weaver *et al*., 2007, Geophysical Research Letters, 34 (L19703), doi: 10.1029/2007GL031018.
[161] http://www.presidentsclimatecommitment.org/pdf/ACUPCC_IG_Final.pdf
[162] http://www.presidentsclimatecommitment.org/html/offsets.php
[163] http://www.nativeenergy.com

5) Conclusions and Recommendations

This final section presents a series of conclusions and specific recommendations related to sustainability at Westfield State College. The overarching theme *'Changing the Culture of Westfield State College'* is presented first, followed by specific recommendations related to our obligations under Executive Order No. 484 and the American Colleges and Universities Presidents Climate Commitment[164].

The proposed Sustainability Action Plan (cf. Section 5.4) includes many more specific recommendations to support the integration of sustainability in all aspects of the college from governance to operations, curriculum, outreach, and residential life.

5.1) Sustainability in Higher Education: Changing the Culture of Westfield State College

Sustainability is not simply something to be added to what we already do, or a consideration to be taken up once decisions have been made.

Instead, becoming sustainable means that the very questions we ask, options we consider, and decisions we make are shaped by the principles of sustainability. What is required is a change in the culture of the college – a change that must involve all members of the campus community: administration, faculty, staff, and students. Such a change takes time but is achievable.

Sustainability in Higher Education adds another dimension and involves more than just the sustainable operation of the campus. Sustainability in Higher Education has to emphasize our unique educational responsibilities and opportunities (cf. Section 1.2).

It is clear that such a transformation will require a committed and multi-dimensional effort. Essential to the success of this effort are implementation oversight, collaboration, and visibility. With this in mind, the five cornerstone recommendations of this plan include:

1. Establish a permanent college-wide Sustainability Committee with diverse representation to implement this plan (cf. Appendix 8).
2. Obtain meaningful input from the campus community in shaping the college's approach to sustainability.
3. Integrate sustainability into the curriculum, identity, and branding of Westfield State College.
4. Foster and enhance connections with the larger community around sustainability.
5. Appropriate adequate funding in the college's annual budget to foster sustainable practices and energy conservation.

Sustainability often comes at a short-term cost – but so does 'unsustainability', but those costs will be transferred to other parts of the world and to future generations.

[164] http://www.presidentsclimatecommitment.org/html/overview.php

5.2) Executive Order No. 484: Recommendations

Executive Order No. 484, especially the reductions required within the next four years for greenhouse gas emissions and energy consumption (cf. Section 1.3.1), poses a significant operational and financial challenge for Westfield State College and requires immediate and meaningful actions. At the same time, it appears that no additional funding will be provided by the Commonwealth.

We recommend a thorough and systematic review of Executive Order No. 484 by Facilities and Operation, Administration and Finance, and the President's Office to ensure our compliance.

5.3) ACUPCC: Tangible Actions and other Recommendations

Westfield State College is currently 'on-tract' with respect to our obligations under the ACUPCC (cf. Fig. 4): the necessary institutional structures are in place and a comprehensive greenhouse gas emission inventory (cf. Section 4.3.3) will be completed and reported to the ACUPCC by September 2008.

We recommend the following three[165] (of seven) ACUPCC 'tangible actions' for initiation and implementation until September 15, 2009 (cf. Section 1.3.2) in order to ensure our continued successful participation and compliance:

1. ***Encourage use of and provide access to public transportation for all faculty, staff, students, and visitors at our institution.***
   This recommendation builds upon the already existing public transportation options at Westfield State College.

2. ***Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.***
   This recommendation is particularly important, as it solicits campus-wide participation, especially from students.

3. ***Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.***
   This recommendation effectively *'double-dips'* with our obligations under Executive Order No. 484 (cf. Section 1.3.1) and provides an immediate and measurable reduction in our greenhouse gas emissions.

These, and the other ACUPCC 'tangible actions' are rank-ordered and further discussed in Appendix 9. The spirit of the ACUPCC, and that of Sustainability in Higher Education in general, certainly encourages us to not limit our engagement to a somewhat arbitrary sub-set of actions.

The following additional three recommendations are related to our ongoing active participation in the ACUPCC and our association with AASHE:

[165] The ACUPCC requires the initiation and implementation of only *two* immediate actions (cf. Section 1.3.2) – however, we feel that recommending a 'Top-Three List' better captures the scope of Sustainability in Higher Education.

- Westfield State College has to play an active role in the ACUPCC and AASHE, for example by attending relevant regional, national, and international meetings related to Sustainability in Higher Education.
- Westfield State College has to formally define a liaison officer/contact person to facilitate interactions between the college and the ACUPCC and AASHE.
- Under the terms of the ACUPCC, Westfield State College has to develop a specific Climate Action Plan[166] to systematically implement all aspects of the ACUPCC.

5.4) Sustainability Action Plan

The proposed action plan includes many more specific recommendations to support the integration of sustainability in all aspects of the college from governance to operations, curriculum, outreach, and residential life. Many of the recommendations can be easily executed, while others will require major financial investments and will have to be phased in. In some cases, the recommendation calls for further study or in depth analysis of an issue before a specific course of action is chosen.

For each recommendation a general timeframe, responsible party, and estimated needed resources have been identified.

[166] http://www.presidentsclimatecommitment.org/html/overview.php

GOVERNANCE AND ADMINISTRATION			
Action	**Timeframe**	**Responsible Party**	**Resources Needed** (estimated)
Adopt this Plan as Part of Westfield State College's Strategic Plan (Section 2.2)	2008-2009	Strategic Planning Committee/ACC/President	
Make Sustainability Central to the Identity and Branding of Westfield State College (including recruitment) (Section 5.1)	2008-2009		
Develop Consistent Graphic Identity (Logo/Slogan) and WWW-site for Sustainability (Section 4.2.1, 5.1)	2008-2009	Sustainability Coordinator Marketing/Public Relations	
Establish a Permanent Sustainability Committee with Diverse Representation (Section 5.1)	2008	ACC	
Adopt a Sustainable Procurement Policy (ACUPCC) (Section 4.2.3, Appendix 9)	2008-2009	President VP Administration & Finance	
Establish a Policy for Offsetting all Greenhouse Gas Emissions Generated by Air Travel Paid for by Our Institution (ACUPCC) (Appendix 9)	2008-2009	President VP Administration & Finance	$25,000
Make Sustainability and Environmentally Friendly Practices the Overarching Theme of Campus Food Services (Section 4.2.4)	Ongoing	President VP Administration & Finance Sustainability Coordinator	$35,000
Pursue Outside Funding Sources For Sustainability Initiatives (Section 4.2.5)	Ongoing	Sustainability Coordinator	
Create Campus Grant Program for Sustainability Initiatives – Especially Student Related (Section 4.2.5, 4.6.2)	2008-2009	Sustainability Coordinator	
Participate in and Host Meetings, Conferences, and Workshops on Sustainability (Section 4.2.5)	Ongoing	Sustainability Coordinator	$10,000
Promote Use of Public Transportation and Expand Alternative Transportation on/to campus (Section 4.2.3, 5.3)	2008-2009 Ongoing	Sustainability Coordinator President/Board of Trustees	$5,000
Study and Make Recommendations on Use of Carbon Offsets (Section 4.7)	Fall 2008	Sustainability Committee	
Highlight Sustainability Programs/Actions and Communicate Successes (Section 4.2.1)	Ongoing	Sustainability Coordinator Marketing/Public Relations	
Prepare and Complete Climate Action Plan in Accordance with ACUPCC Criteria and Obligations (Section 1.3.2, 5.3)	2008-2009	Sustainability Coordinator Sustainability Committee	
Obtain Meaningful Input on this Plan from the College Community (Section 5.1)	2008-2009	Sustainability Coordinator Sustainability Committee	

FACILITIES AND OPERATIONS			
Action	**Timeframe**	**Responsible Party**	**Resources Needed** (estimated)
Replace Halogen Lighting with High Efficiency Fluorescent in First-Phase Buildings (Section 4.3.6)	2008-2010	Facilities & Operations	$400,000
Install 40 Occupancy Sensors in Bates Hall (Section 4.3.6)	2008-2010	Facilities & Operations	$20,000
Purchase 15 percent of energy from Renewable Sources (Section 5.3, Appendix 9)	2008-2009	Facilities & Operations	$35,000
Develop 10 year Energy Plan with DCAM (Section 4.3.6)		Facilities & Operations	
Replace old Heating Plant Boilers with More Energy Efficient Option (Section 4.3.6)	Long term	Facilities & Operations	$2,250,000
Install Occupancy Sensors Throughout Campus (Section 4.3.6)	Long term	Facilities & Operations	$350,000
Reduce Oil Consumption with New Building Control Systems (Section 4.3.6)	Long term	Facilities & Operations	$200,000
Establish a Model Green Building System as an Educational Tool (e.g. Green Roof, Photovoltaic, Geothermal, Zero Energy Building, etc.)	Shorter term	Facilities & Operations	$40,000,000
Implement Recommendations from Energy Audits Completed in Spring 2008 (Section 4.3)		Facilities & Operations	
Research Funding for Renewable Energy Projects (Section 4.3)		Facilities & Operations Sustainability Coordinator	
Increase Visibility and Access to Recycling Containers Across Campus (Section 4.3, 4.6, 5.3, Appendix 9)	2008	Facilities & Operations	$200,000
Utilize Performance Contracting for Sustainability and Energy Efficiency Improvements (Section 3.3, 4.3)	Ongoing	Facilities & Operations	

CURRICULUM: EDUCATION AND RESEARCH			
Action	**Timeframe**	**Responsible Party**	**Resources Needed** (estimated)
Infuse Sustainability Issues into Existing Courses (Section 4.4.2)	2008/ongoing	Faculty and Academic Affairs	
Adopt Sustainable Practices in Course Delivery (paperless, etc.) (Section 4.4.2)	2008/ongoing	Faculty/Support from CIT	
Develop New Courses on Sustainability (Section 4.4.2)	2008/ongoing	Faculty Curriculum Committee/ACC	
Establish a New Sustainability Major or Area of Concentration (Section 4.4.2)	2008-2009	Curriculum Committee/ACC Create a committee to explore and recommend	
Make Sustainability an Opening Day Theme (Section 4.4.2)	Summer 2008	Sustainability Committee Academic Affairs Sustainability Coordinator	
Create a Sustainability Certificate Program for Professionals Through DGCE (Section 4.4.2)	2008-2009	DGCE	
Hold a Brown Bag Series on Sustainability with an Interdisciplinary Focus (Section 4.4.2)	2008-2009	Sustainability Committee Sustainability Coordinator	
Elevate the Social Justice Component of Sustainability with Speakers/Education Series (Section 4.4.2)	Spring 2009 Ongoing	Sustainability Committee Sustainability Coordinator	
Recommend a Sustainability Themed Book for the Campus Book (Section 4.4.2)	2009-2010	Sustainability Committee Sustainability Coordinator Campus Book Committee	
Sponsor an Independent Study on Green Campus Initiatives to Create Idea Bank of Sustainable Practices (Section 3.8, 4.4)	2008-2009	Interested Student Sustainability Coordinator Faculty Member	$5,000
Support Faculty Research on Sustainability Issues (Section 4.4)	Ongoing	Academic Affairs/Faculty	$30,000
Support Sustainability Related Curriculum Development with Release Time and Funding (Section 4.4)	Ongoing	Academic Affairs/Faculty	$50,000
Explore Establishing a Center for Sustainability Issues (cf. Section 4.4.2)	2008-2009	Sustainability Committee Sustainability Coordinator Academic Affairs/Faculty	

COMMUNITY SERVICE, OUTREACH, AND ADVOCACY			
Action	**Timeframe**	**Responsible Party**	**Resources Needed** (estimated)
Create and Publicize Sustainability Themed Experts List and Speaker Bureau (Section 4.5.3)	2008/ongoing	Public Relations	
Expand K-12 Sustainability Themed Lessons and Projects (Section 4.4, 4.5)	2008/ongoing	Education Department Science Education Local School District Partners	
Expand Campus-Community Educational Programming (Section 4.5)	2008/ongoing	Sustainability Coordinator Sustainability Committee Local Partners	
Participate in Local, Regional, and National Organizations (Section 4.5)	2008/ongoing	Sustainability Coordinator with Others	
Maintain List of Area Organizations Interested in Sustainability Research or Projects (Section 4.5)	2008/ongoing	Sustainability Coordinator with Others	
Grow the Annual *'Green Fair'* (Section 4.5.3)	2008/ongoing	Sustainability Coordinator with Others	$5,000
Use International Education Program to Further Sustainability Efforts (Section 4.5)	2008/ongoing	International Education in cooperation with others	
Advocate for Sustainability Issues at all Levels of Government (Section 4.5.3)	2008/ongoing	Sustainability Coordinator Sustainability Committee	
Make all Campus Events Climate Neutral (Section 4.5)	2008/ongoing	Sustainability Coordinator	$25,000

CAMPUS AND RESIDENTIAL LIFE			
Action	**Timeframe**	**Responsible Party**	**Resources Needed** (estimated)
Participate in National *'RecycleMania'* Competition (ACUPCC) (Section 4.6.2, 5.3, Appendix 9)	2008/ongoing	Green Team/Students Residential Life	$5,000
Support the Sustainable Living Area in Davis Hall (Section 4.6.1)	2008/ongoing	Sustainability Coordinator Sustainability Committee Residential Life	
Provide Funding for the Work of *Green Team* Members (and Other Interested Students) and for Students to attend Conferences, Workshops, Rallies, and Training (Section 4.6.2)	2008/ongoing	Sustainability Coordinator	$10,000
Explore Student Peer Education Program Based on *'Eco-Rep'* Model (Section 4.6.2)	2008-2009	Green Team/Students Residential Life Sustainability Coordinator	
Support Residential Life Sustainability Related Programming and Educational Opportunities (Section 4.6)	Ongoing	Residential Life Sustainability Coordinator	
Use Student Orientations As Educational Opportunity Around Sustainability (Section 4.6)	2008/ongoing	Student Affairs Student Affairs Committee	$5,000

Appendix 1 The Ad Hoc Committee on Sustainability

The All-College Committee formed the Ad Hoc Committee on Sustainability on February 20, 2008. The committee was asked to consider all ways that we (i.e. Westfield State College) can reduce energy consumption, inventory our greenhouse gas emissions, and begin the development of an institutional action plan for becoming climate neutral.

Committee members included (in alphabetical order):

William Bickley	Campus Sustainability Coordinator
Carsten Braun	Geography & Regional Planning - chair
Marijoan Bull	Geography & Regional Planning - recording secretary
Mark Cabral	Student
Trudy Knowles	Education
Andrea LeClair	Student
Randi Lucius	Student
Arthur O'Leary[167]	Public Safety
Curt Robie	Facilities & Operation

The Ad Hoc Committee on Sustainability met regularly on Tuesdays at 08:00 in the Corner Café.

The meeting schedule and complete minutes are available on the committees WWW-site: http://www.wsc.ma.edu/garp/sustainability.html

Meeting 1	02/19/2008	
Meeting 2	02/26/2008	
Meeting 3	03/04/2008	
Meeting 4	03/18/2008	(with C. Hirtle, IT Director)
Meeting 5	03/25/2008	
Meeting 6	04/01/2008	(with Dr. Cortese[168])
Meeting 7	04/08/2008	
Meeting with President Dobelle	04/08/2008	
Meeting with ACC	04/09/2008	(Presentation of Preliminary Report)
Meeting 8	04/15/2008	
Meeting 9	04/22/2008	
Meeting 10	04/29/2008	
Meeting 11	05/06/2008	
Meeting 12	05/09/2008	
Meeting 13	05/13/2008	
Meeting with ACC	05/14/2008	(Presentation of Final Report)

The preliminary and final reports, and associated presentations to the ACC, are available on the committee's WWW-site.

[167] Resigned from the Ad Hoc committee on Sustainability on 05/01/2008.
[168] President of http://www.secondnature.org/ and chief organizer of the ACUPCC.

Appendix 2 Executive Order No. 484 of the Governor of Massachusetts

By His Excellency

DEVAL L. PATRICK

GOVERNOR

EXECUTIVE ORDER NO. 484

LEADING BY EXAMPLE—CLEAN ENERGY AND EFFICIENT BUILDINGS

WHEREAS, buildings are significant users of energy, water and natural resources, consuming 39% of U.S. energy, 70% of U.S electricity, 12% of U.S. potable water, and 40% of raw materials globally;

WHEREAS, the Commonwealth of Massachusetts manages over 64 million square feet of buildings at hundreds of facilities, which annually consume over 1 billion kilowatt hours of electricity, 22 million gallons of heating oil, and 46 million therms of natural gas;

WHEREAS, such energy consumption results in greenhouse gas emissions totaling more than 1.1 million tons per year, equivalent to the emissions generated by more than 200,000 cars driven for one year;

WHEREAS, environmental and health issues related to energy consumption, such as global climate change, regional mercury contamination, and urban asthma rates are critical issues that need to be addressed immediately and comprehensively;

WHEREAS, state government has an obligation to lead by example and demonstrate that large entities such as state colleges and universities, prisons, hospitals and others can make significant progress in reducing their environmental impacts, thereby providing a model for businesses and private citizens;

WHEREAS, by setting clean energy targets and developing clean energy practices, state agencies can play an important role in the development and support of new and local technologies, fostering innovation and benefiting the Massachusetts economy;

WHEREAS, leading-by-example programs can not only reduce environmental and health impacts but can also lead to significant cost savings;

WHEREAS, the Commonwealth is already committed to environmental protection and resource conservation through a variety of regional and state commitments, including, but not limited to, the Clean State Initiative, the Massachusetts Beyond 2000 Solid Waste Master Plan, the New England Governors/Eastern Canadian Premiers 2001 Climate Change Action Plan, the Commonwealth's Climate Protection Plan, the Toxics Use Reduction Reform Act of 2006, the

Massachusetts Zero Mercury Strategy, and the Mass. LEED Plus green building standards for state construction;

WHEREAS, all the clean energy and environmental efforts under way within state government operations should be coordinated to ensure that programs are developed and implemented as effectively and efficiently as possible;

WHEREAS, this Administration intends to send a clear message to all state agencies that practicing what we preach is a priority and that agencies should integrate clean energy, environmental protection, and resource conservation programs, policies and procedures into all appropriate aspects of governing;

NOW, THEREFORE, I, Deval L. Patrick, Governor of the Commonwealth of Massachusetts, by virtue of the authority vested in me by the Constitution, Part 2, c. 2, § I, Art. I, order as follows:

I affirm that state agencies shall prioritize practices and programs that address resource use at state facilities, including a reduction in energy consumption derived from fossil fuels and emissions associated with such consumption.

Furthermore, I direct the Executive Offices of Energy and Environmental Affairs (EOEEA) and Administration and Finance (A&F) to establish and direct a Leading by Example Program (the Program), the purpose of which shall be to oversee and coordinate efforts at state agencies, including all UMass campuses and all state and community colleges, to reduce their environmental impact. Such efforts shall include, but not be limited to, the provisions of this Order to promote energy conservation and clean energy practices, as well as waste reduction and recycling, environmentally preferable procurement, toxics use reduction, water conservation, sustainable transportation, open space and natural resource protection, and improved compliance practices.

The Secretaries of EOEEA and A&F or their designees shall co-chair the Leading by Example Council (Council), which shall consist of members from each of the Commonwealth Executive Offices, with specific additional membership to be determined by the co-chairs. The purposes of the Council shall be to provide advice and feedback to the Program to facilitate the implementation of key initiatives that will result in reduced environmental impacts at state agencies. The Council shall coordinate efforts with all agencies, who shall appoint program coordinators to act as liaisons between the Council and agency staff and support Program efforts.

Furthermore, the Program shall direct all efforts across state government to track and measure progress toward clean energy and environmental goals, develop long-term programs at state facilities to identify and implement cost-effective initiatives that will result in environmental improvement, and offer educational and training efforts necessary to carry out the provisions of this Order and other related directives. Agencies shall provide all necessary support to the Council and Program and agency staff shall serve, as appropriate, on the Council or other internal committees as requested by the Secretaries of EOEEA and A&F. Agencies shall also provide all requested data related to facility operations and energy use at least annually or on an alternative schedule determined by the Council.

I. Energy Targets for Agency Buildings

All Commonwealth agencies as a whole and, to the greatest extent feasible individually, shall meet the following targets:

- Reduce greenhouse gas emissions that result from state government operations by 25% by Fiscal Year 2012, 40% by 2020 and 80% by 2050. In calculating emissions, agencies shall use Fiscal Year 2002 as the baseline, and emissions reductions shall be measured on an absolute basis and not adjusted for facility expansion, load growth, or weather.
- Reduce overall energy consumption at state owned and leased (at which the state pays directly for energy) buildings by 20% by Fiscal Year 2012 and 35% by 2020. Such reductions shall be based on a Fiscal Year 2004 baseline and measured on a BTU per square foot basis.
- Procure 15% of agency annual electricity consumption from renewable sources by 2012 and 30% by 2020. This mandate may be achieved through procurement of renewable energy supply, purchase of renewable energy certificates (RECs) in accordance with EOEEA guidance and/or through the production of on-site renewable power. Only renewable sources that qualify for the Massachusetts Renewable Portfolio Standard (RPS) shall be eligible. Alternative compliance payments under 225 CMR 14.08 shall not be required under this Order.
- Utilize bio heat products with a minimum blend of 3% bio based materials for all heating applications that use #2 fuel starting with the winter of 2007-2008, and 10% bio heat blend by 2012.
- All new construction and major renovations, effective immediately, must meet the Mass. LEED Plus green building standard established by the Commonwealth of Massachusetts Sustainable Design Roundtable.
- Reduce potable water use, as compared to 2006, by 10% by 2012 and 15% by 2020.

Where appropriate, EOEEA, A&F and the Council shall establish alternative baselines and guidelines for meeting the above targets.

II. Clean Energy Committee

A Clean Energy Committee, to be chaired by Secretary of the Executive Office of Energy and Environmental Affairs and the Commissioner of the Division of Capital Asset Management (DCAM), or their designees, shall be established to facilitate implementation of this Order and to assist agencies in their efforts to meet the targets and requirements herein. The Committee shall consist of representatives of the Division of Energy Resources (DOER), the Operational Services Division (OSD), and other agencies as determined by the chairs. The Committee shall meet regularly and shall communicate with agencies through designated Program Coordinators, who shall be responsible for disseminating all applicable information from the Committee to agency staff, coordinating agency energy activities, and tracking and reporting all requested energy consumption data to the Committee and Council.

The Committee shall, by February 1st of each year, submit to the Governor an annual report on the results of energy conservation actions taken by agencies during the prior fiscal year, the environmental and economic impacts of such actions, and recommendations for future energy reductions. The Committee shall also solicit advice on energy reduction goals from experts outside of state government, including, but not limited to, federal agencies, other states, and not-for-profit organizations. The Committee shall also consider and propose longer-term energy conservation strategies for state government and submit such proposals to the Governor.

III. Energy Measures and Strategies

To meet the above targets, agencies may utilize a variety of energy conservation, energy efficiency and renewable energy strategies, including but not limited to:

- Comprehensive on-site energy efficiency programs
- Installation of energy efficient HVAC equipment
- Fuel switching
- Purchase of energy efficient products
- Increased energy conservation by employees
- Installation of on-site renewable energy and combined heat and power systems
- Procurement of renewable energy
- Use of bio-based and other alternative fuels
- Purchase of Renewable Energy Certificates

To meet the goals of this Order, all agencies shall adopt, where applicable, specific measures including but not limited to:

Energy Conservation

- 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.
- Run dishwashers and laundry equipment only when fully loaded.
- Set thermostats 2 degrees lower than usual during the winter and 2 degrees higher than usual during the summer.
- Reduce lighting in common areas without compromising safety.
- Minimize energy use at facilities during non-work hours.

Energy Efficient Products

I direct the Environmentally Preferable Products (EPP) Program of OSD to continue to make energy efficient products available on statewide contracts that meet the needs of state agencies and the requirements of this Order. Agencies shall also adopt, where applicable, specific energy efficiency measures including but not limited to the following:

- Use only efficient lights such as compact fluorescent lamps, LED lighting, or other similar products. Until further notice, agencies shall be prohibited from purchasing incandescent lights unless absolutely necessary to meet a specific and unique agency need.
- Install LED and/or photoluminescent exit signs to replace those with incandescent or fluorescent lighting wherever cost effective.
- Install programmable thermostats.
- Install motion sensors or timing devices in rooms that are used only intermittently, such as conference rooms, bathrooms, etc.
- Procure only computers, monitors, copiers, printers, and other office equipment that are EnergyStar qualified, enable all EnergyStar features upon installation, and establish policies and procedures to ensure that such equipment continues to operate efficiently during its life.

Energy Efficiency Programs

I direct the Division of Capital Asset Management, in collaboration with EOEEA, to maximize the number and scope of energy efficiency efforts at state facilities. DCAM and EOEEA shall, in consultation with A&F, identify and recommend appropriate changes to construction laws and financing mechanisms necessary to ensure that the following goals are achieved by the end of Fiscal Year 2012:

- Comprehensive, large-scale energy efficiency projects at all appropriate facilities over 100,000 square feet.
- 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.
- 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.

Furthermore, DCAM and EOEEA shall coordinate efforts to ensure that:

- All renovation and new construction projects identify and utilize all available utility rebates.
- 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.
- Changes to building processes, funding mechanisms and regulations that are necessary to meet the goals of this Order are developed and implemented.

In addition, DCAM is directed to ensure that site selection for leased space considers energy performance.

Energy Training and Maintenance

DCAM's Office of Facilities Maintenance shall, in coordination with agencies:

- 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.
- Ensure that all appropriate staff receive regular training on proper facility management and maintenance practices.

IV. Renewable Energy

To achieve the renewable energy goals of this Order and obtain 15% of agency electricity from renewable resources by 2012 and 30% by 2020, agencies shall make every effort to power their facilities with clean, renewable energy resources (e.g. wind, solar PV, solar thermal, biomass, landfill gas, anaerobic digestion) that are RPS eligible. Such efforts may include the installation of on-site distributed generation, the purchase of renewable power from energy suppliers, and/or the use of Renewable Energy Certificates (RECs) in compliance with the REC guidance established by EOEEA.

EOEEA, DCAM, OSD and DOER shall continue to assist agencies in meeting these goals through bundled clean electricity contracts, technical and financial assistance, project management and policy initiatives. These entities shall continue to monitor and evaluate options for increasing the renewable energy portfolio of state government's electricity use.

V. Biofuels

To achieve the 3% bioheat goal of this Order, agencies shall commence the purchase of this fuel as of October 1, 2007 for all facilities that use #2 heating oil, or as soon as available through statewide contracts. To facilitate agency use of this fuel, EOEEA and OSD shall conduct informational and training sessions prior to October 1, 2007 to address any questions and report on the result of the bioheat pilot conducted during the winter of 2006-2007. Additionally, OSD is hereby directed to establish a heating fuel contract that specifies biofuel for oil heating products specified by this Order.

Furthermore, I direct EOEEA and OSD to work with cities and towns to inform them of this new policy and encourage them to utilize bioheat. Pending availability, performance and cost, EOEEA and OSD shall review annually the use of bioheat and develop recommendations for increasing the bioheat goals in this Order to a minimum of 10% by 2012.

VI. Building Design and Construction

DCAM and all 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.

To achieve these goals, I endorse the recommendations of the Commonwealth of Massachusetts Sustainable Design Roundtable (Roundtable), which require all new construction at state agencies and significant renovation projects over 20,000 square feet to meet a Mass. LEED Plus building standard. For projects smaller than 20,000 square feet, all projects shall at least meet the minimum energy performance standards established by the Roundtable.

The Mass. LEED Plus standard includes:

- 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;
- Energy Performance 20% better than the Massachusetts Energy Code;
- Independent 3rd party commissioning;
- Reduction of outdoor water consumption by 50% and indoor water consumption by 20% relative to standard baseline projections; and
- Conformance with at least 1 of 4 identified smart growth criteria.

The Mass. LEED Plus standard shall apply to all projects overseen by DCAM and any other executive agency, as well as those that are built for use by state agencies on state land. In addition, EOEEA shall coordinate efforts to incorporate the Mass. LEED Plus standard into all non-executive branch agencies involved in construction. EOEEA and DCAM shall report each year on progress made with regard to integration of this standard into state building projects.

Furthermore, whenever DCAM requires the construction of a new building to be leased by DCAM, DCAM shall establish and incorporate energy performance criteria consistent with the energy goals of this Order.

Additionally, I direct EOEEA and DCAM to support education and training programs for agency personnel and periodically consult with design and construction practitioners to review progress in meeting green building standards, develop strategies to improve communication of the benefits of green buildings, and identify new opportunities for expanded green building efforts.

VII. Distributed Generation

In order to facilitate the installation of on-site renewable energy and Combined Heat and Power projects, within 6 months of the date of this Order, the DOER shall provide an analysis of the barriers to distributed generation that impede the successful completion of such projects at state facilities and, through collaboration with DCAM, OSD, and the Comptroller's office, shall develop recommendations on addressing identified barriers.

Forward Capacity Market

In order to take advantage of the new ISO-New England Forward Capacity Market (FCM) Program, including the Demand Response Program, which allocate payments for new electric generation capacity, and measurable reductions in electricity use, agencies shall identify and submit all applicable projects for inclusion in the FCM program. DCAM shall coordinate this effort and, in collaboration with EOEEA and OSD, establish the necessary vehicles to facilitate agency participation in this program as well as ensure that payments received are allocated to agencies for additional energy reduction activities. DCAM may elect to allocate portions of FCM payments in order to manage this program as well as other related energy efforts.

IX. Energy Tracking

The EOEEA is hereby charged with development and implementation of an Energy Information System (EIS) that shall facilitate the tracking of agency energy use and prioritization of energy efficiency programs and projects at state facilities. Such a system will allow facilities to compare building energy consumption and rate energy performance of Commonwealth buildings. DOER and DCAM shall collaborate in the development of the EIS and shall work to ensure that DCAM information systems, such as CAMIS, are effectively linked with any new energy tracking systems. EOEEA and DCAM shall annually track all energy use at state facilities to determine compliance with the goals of this Order and, as appropriate, share this data with other state agencies to further the purposes of this Order.

The development of the EIS shall not eliminate the need for agencies to track other energy and water use and submit annual data to EOEEA as directed by the Council.

X. Water Conservation

Agencies shall make every effort to reduce overall water use and increase water use efficiency to the maximum extent possible. Toward this end, all state agencies shall reduce water use through the following indoor and outdoor measures:

Indoor Water Consumption

- Conduct periodic water audits and system-wide leak detection programs.
- Work toward metering all significant water uses.
- Strictly apply plumbing codes, and actively promote waterless plumbing fixtures, where appropriate.
- Replace and retrofit older water consuming equipment, such as toilets, faucets and showerheads, with modern, more efficient devices as quickly as possible.
- 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.

Outdoor Water Consumption

- Minimize, and wherever possible eliminate, use of potable water and groundwater for outdoor watering purposes, street cleaning, and building washing.
- Lower watering frequency.
- Improve watering efficiency by watering lawns and plants only when necessary through use of moisture sensors and/or drip irrigation techniques.
- 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.
- When procuring services for lawn and landscape maintenance, require contractors to minimize water use wherever possible through incorporation of the above techniques.

XI. Technology

Agencies are hereby directed to analyze and consider use of innovative technologies wherever possible, either on a pilot- or long-term basis, when such technologies can demonstrate environmental and fiscal benefits. Where possible, and to the extent permitted by law, agencies shall work to identify technologies developed and/or manufactured in Massachusetts.

XII. Financing

In order to facilitate the above efforts, EOEEA and A&F shall, within 6 months of the effective date of this Order, submit to me recommendations concerning financing options that will result in energy and water improvements at state facilities without requiring significant infusion of state funding.

XIII. Resources and Commitment

All agencies shall provide the necessary resources and commitment to meet the goals of this Order.

XIV. Effective Date

This Order shall take effect immediately and shall continue in effect until amended, superseded, or revoked by subsequent Executive Order. This Order shall supersede Executive Order No. 438 and all provisions contained in Administration Bulletin #11 and #12.

Given at the Executive Chamber in Boston this 18th day of April in the year of our Lord two thousand and seven, and of the Independence of the United States of America two hundred and thirty-one.

GOD SAVE THE COMMONWEALTH OF MASSACHUSETTS

Appendix 3 American College and University Presidents Climate Commitment[169]

We, the undersigned presidents and chancellors of colleges and universities, are deeply concerned about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects. We recognize the scientific consensus that global warming is real and is largely being caused by humans. We further recognize the need to reduce the global emission of greenhouse gases by 80% by mid-century at the latest, in order to avert the worst impacts of global warming and to reestablish the more stable climatic conditions that have made human progress over the last 10,000 years possible.
While we understand that there might be short-term challenges associated with this effort, we believe that there will be great short-, medium-, and long-term economic, health, social and environmental benefits, including achieving energy independence for the U.S. as quickly as possible.

We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality. Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society. These colleges and universities will be providing students with the knowledge and skills needed to address the critical, systemic challenges faced by the world in this new century and enable them to benefit from the economic opportunities that will arise as a result of solutions they develop.

We further believe that colleges and universities that exert leadership in addressing climate change will stabilize and reduce their long-term energy costs, attract excellent students and faculty, attract new sources of funding, and increase the support of alumni and local communities. **Accordingly, we commit our institutions to taking the following steps in pursuit of climate neutrality:**

1. Initiate the development of a comprehensive plan to achieve climate neutrality as soon as possible.

    a. Within two months of signing this document, create institutional structures to guide the development and implementation of the plan.

    b. Within one year of signing this document, complete a comprehensive inventory of all greenhouse gas emissions (including emissions from electricity, heating, commuting, and air travel) and update the inventory every other year thereafter.

    c. Within two years of signing this document, develop an institutional action plan for becoming climate neutral, which will include:

        i. A target date for achieving climate neutrality as soon as possible.

        ii. Interim targets for goals and actions that will lead to climate neutrality.

        iii. Actions to make climate neutrality and sustainability a part of the curriculum and other educational experience for all students.

[169] http://www.presidentsclimatecommitment.org/html/commitment.php

iv. Actions to expand research or other efforts necessary to achieve climate neutrality.

v. Mechanisms for tracking progress on goals and actions.

2. Initiate two or more of the following tangible actions to reduce greenhouse gases while the more comprehensive plan is being developed.

a. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.

b. Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.

c. Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.

d. Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution

e. Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.

f. Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.

g. Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.

3. Make the action plan, inventory, and periodic progress reports publicly available by providing them to the Association for the Advancement of Sustainability in Higher Education (AASHE) for posting and dissemination.

In recognition of the need to build support for this effort among college and university administrations across America, we will encourage other presidents to join this effort and become signatories to this commitment.

Signed,

The Signatories of the American College & University Presidents Climate Commitment

Appendix 4 Sustainability Action Plans (2007/2008)[170]

Student Affairs

i) Staff will actively participate in campus recycling program.
   - Key Actions: To reduce paper usage
   - Progress Indicators (Measurable): department newsletter will be converted to electronic formats.
   - Timeline: Fall 2007/Spring 2008.
   - Persons or Groups Responsible: All Student Affairs staff.

ii) The college will work with students to provide education regarding sustainability efforts.
   - Key Actions: Educational programs and incentives will be developed for students.
   - Progress Indicators (Measurable): A minimum of four (4) new student educational and incentive programs will be implemented including a Campus Sustainability Fair.
   - Timeline: Fall 2007/Spring 2008.
   - Persons or Groups Responsible: Various Student Affairs departments.

iii) Conduct a feasibility study to assess the need for new energy efficient (green) lighting for Alumni Field.
   - Key Actions: Study will be conducted.
   - Progress Indicators (Measurable): Results will be used to determine energy and cost savings impact of new lighting for Alumni Field.
   - Timeline: Spring 2008.
   - Persons or Groups Responsible: Assistant VP of Facilities & Operations/Director of Athletics.

iv) Investigate the feasibility of converting to electronic medical records.
   - Key Actions: Review state record keeping regulations and contact local hospitals to gather information.
   - Progress Indicators: Decision about electronic record keeping made with timeline for implementation will be determined if project is feasible.
   - Timeline: Fall 2007
   - Persons or Groups Responsible: Director of Health Services

Academic Affairs

i) Increase the use of web-based surveys in teacher education, assessment, as well as provide links which will decrease the necessity of mailing and print.
   - Key Actions: Move specific surveys to web-based environments starting with employer and student teacher surveys for this academic year. Move specific surveys to web-based; create program-specific links.
   - Progress Indicators (Measurable): Web-based employer survey launched in summer 2008 and student teacher survey collected electronically in spring 2008. Presence of the surveys and links of DGCE website.
   - Timeline: *not specified.*

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- Persons or Group Responsible: Richard Frank and Dean of Education.

ii) Implement online Student bill presentation and bill payment.
- Key Actions: Implement Phase 1 of CORE e-Commerce Project.
- Progress Indicators (Measurable): 75% of DAY students bills will be available through online bill presentation. 10% of student bills will be "returned" online.
- Timeline: Spring 2008.
- Persons or Group Responsible: Director of Student Accounts.

Administration and Finance

i) Implement purchase order email option to allow purchasing to email a purchase order to a vendor instead of printing and sending PO's through the mail.
- Key Actions: Install software, train end users, solicit email addresses from vendors.
- Progress Indicators (Measurable): Number of purchase orders e-mailed will increase/printed and mailed will decrease (report on number of PO's emailed).
- Timeline: FY 2008.
- Persons or Group Responsible: Purchasing/Finance.

ii) The F&O Department would like to reduce the amount of batteries recycled each year by the department.
- Key Actions: The department will begin to replace all battery operated equipment with rechargeable equipment wherever possible. This will include all flashlights. In cases where equipment requires the use of batteries, rechargeable batteries will be purchased.
- Progress Indicators (Measurable): the indicator of success for this goal will be to monitor the amount of batteries that are recycled each year.
- Timeline: An assessment will be made on the progress of this goal at the end of Fall 2008 semester and more so at the end of the Spring 08 semester.
- Persons or Group Responsible: *not specified.*

iii) The department would like to develop a plan and project to reduce and control lighting on college building hallways. This would reduce the cost of electricity and reduce pollutants going into the atmosphere.
- Key Actions: The department will work with a lighting consultant to study existing lighting levels and develop plans to either reduce the number of existing fixtures or replace existing fixtures with more energy efficient fixtures.
- Progress Indicators (Measurable): Metering of college building and computations on energy savings between existing lighting and replacement lighting will be used to determine the success of the program.
- Timeline: If funding is available to hire the consultant, the study could be completed during the Fall and early Spring semester with cost estimates to retrofit work available for the FY 09 budget cycle.
- Persons or Group Responsible: The College will have to supply the necessary funding to hire a consultant and to replace or retrofit existing fixtures. Much of the labor could be accomplished using college staff however this would reduce time for other possible college projects. The cost of a lighting

consultant should not exceed $10,000. Estimates for replacement fixtures would be available after the lighting survey is completed.

iv) The F&O Department would like to change from plastic trash bags to biodegradable trash bags. This project would reduce the amount of plastic the college contributes to the waste stream.
- Key Actions: the department would research types of bags on the market to determine the strength and cost of the bags. A check of state contract environmental vendors would be made to see if the products can be purchased off of existing state contracts. The college would then implement a pilot program to access the quality and functionality of the bags. Based on the success of the pilot program, a decision would be made to implement the program college-wide.
- Progress Indicators (Measurable): Success will be realized by implementing the plan and calculating the amount of plastic reduced by changing to biodegradable bags.
- Timeline: Obtain college commitment for funding. Complete research and pilot program during the Fall 08 semester. Implement program based on funding during the Spring 08 semester.
- Persons or Group Responsible: Most work can be accomplished by F&O staff. The college would have to commit to paying more for the biodegradable bags which tend to cost 30-50% more than plastic bags.

v) The Department would like to raise and lower building temperatures to coincide with heating and cooling limits established by the Commonwealth of Massachusetts.
- Key Actions: the department will raise and lower building thermostats to recommended temperatures. Given the age of building systems close monitoring will need to be implemented to insure temperatures are maintained at appropriate levels.
- Progress Indicators (Measurable): This will be difficult to monitor. The only way at this time will be to look at potential energy savings at the close of the fiscal year.
- Timeline: Building temperature settings will have to be reset. This could take place during the fall semester.
- Persons or Group Responsible: The college community will need to commit to the new temperature settings and adjust. There may be some cost to replace existing thermostats as necessary.

vi) The F&O department would like to develop and implement a program to improve recycling on campus. This would include looking at waste streams and developing programs to address them. As part of this program new recycling containers would be recommended for campus buildings and grounds. The Department would also examine ways to reduce a cost by using compactors and other mean of bulk disposal.
- Key Actions: The Department has already begun to research new recycling containers. It is also working to install several large compactors behind the Ely Building. Once decisions have been made on a container program, containers will be purchased based upon funding to allow for the purchase of enough containers in one year.

- Progress Indicators (Measurable): The amount of recycled product will be monitored.
- Timeline: Appropriate containers could be researched during the fall semester. Purchase o the containers could begin once funding has been established.
- Persons or Group Responsible: College community will need to embrace the new program. The college will have to fund the cost of containers. This program may also require extra staff to insure its success. This will be determined as the program is developed and implemented.

vii) The Department would like to hire a consultant to help develop a program to monitor green house gas emissions on the campus. This is a critical piece in meeting requirements in Executive Order 484 and the Campus Climate Commitment. This program once developed will allow the college to keep statistics to meet future reduction standards in green house gases

Appendix 5 Letter to Vice President for Administration and Finance regarding sustainability and Campus Dining Services[171]

22 April 2008

Mr. Tim Murphy, Vice President for Administration and Finance
Westfield State College
PO Box 1630
Westfield, MA 01086-1630

Re: Dining Services Contract for Westfield State College

Dear Mr. Murphy,

In February of 2008 the All College Committee created an Ad Hoc Committee on Sustainability and charged this group with developing a comprehensive Sustainability Plan for the College. This committee has been meeting regularly since its inception and anticipates submitting a draft plan in mid-May. Westfield State College's Sustainability Plan will speak to the importance of changing culture by adopting a consistent institutional philosophy in support of sustainability.

During our meetings it has come to our attention that the College is presently looking into re-negotiating its contract for food services. The Sustainability Committee would like to go on record as stating that dining services on campus should, along with other institutional practices, integrate sustainability measures. There are many practical (and proven) means for doing this including: tray-less dining, buying local products, using non-disposable items, and recycling the waste stream. The Sustainability Committee urges the College to make sustainability an integral part of any new or re-negotiated contract for food services.

Thank you for your work on behalf of the College, and please feel free to contact me with any questions.

Sincerely,

Carsten Braun, Chair
Ad Hoc Committee on Sustainability

cc: Jack Shea, Chair All College Committee
Bill Bickley, Sustainability Coordinator

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Appendix 6 External Funding Opportunities[172]

Below are some of the funding sources available for college sustainability projects:

Student Sustainable Design Competition
The U.S. EPA's $1.25 million award-grant program encourages teams of college students to research, develop, and design scientific and technical solutions to sustainability challenges that protect the environment while achieving continued economic prosperity.
http://www.epa.gov/P3

The Cottonwood Foundation
The Cottonwood Foundation offers small grants to local community organizations (including school-based groups) that use volunteer energies to protect the environment. The Cottonwood Foundation is interested primarily in funding that makes a difference for local community empowerment.
http://www.cottonwoodfdn.org

National Center for Environmental Research
The National Center for Environmental Research offers grants to academic institutions and students to fund environmental projects and research.
http://es.epa.gov/ncer

Leopold Leadership Fellowship Program
Every year, Leopold Leadership Fellowship Program selects up to 20 mid-career academic environmental scientists in North America to participate in two week training that includes modules on effective communication with policy makers, the media, industry, government agencies, and non-governmental organizations.
http://www.leopoldleadership.org/content/index.jsp

Environmental Justice Small Grants Program
The Environmental Justice Small Grants Program was established in 1994 to provide financial assistance to eligible community groups (community-based /grassroots organizations, churches, schools, other non-profit organizations, local governments, and tribal governments) that are working on or plan to carry out projects to address environmental issues.
http://www.epa.gov/compliance/environmentaljustice

EPA Environmental Education Grants Program
The EPA Environmental Education Grants Program awards $2 to 3 million annually.
http://www.epa.gov/enviroed/grants.html

Albert I. Pierce Foundation (AIP) Grants
The Albert I. Pierce Foundation is a private charitable foundation supporting the environment and the arts by providing awards for community-based projects in the areas of the arts, education, the environment or a combination of the three focus areas.
http://www.aipfoundation.org/

Environmental Leadership Program (ELP) Fellowship
The Environmental Leadership Program provides intensive leadership and skills training with opportunities for mentoring, project seed money, and technical support designed to nurture a new

[172] Section 4.2.5

generation of environmental leadership that is characterized by diversity, innovative thinking, coalition building, and effective communications.
http://www.elpnet.org/fellowship.html

Environmental Stewardship Grant Program
Environmental Stewardship Grant Program provides support to community-based projects that protect, enhance or preserve the environment.
http://www.entergy.com/Corp/she/grant.asp

Do Something Grants for Youth Community Projects
This organization provides grants to students who identify problems in their community and then develop a plan to *'Do Something'* to make a difference.
http://www.dosomething.org/

EPA EE Grant Program
The EPA EE Grant Program seeks grant proposals that support environmental education projects that promote and enhance environmental stewardship and help develop public awareness in making informed and responsible decisions that affect environmental quality.
http://www.epa.gov/enviroed/grants.html

Red, White and Green Climate Change Grant
Youth Service America and the Civil Society Institute grant opportunity for young people (ages 15-25) and to organizations that engage youth (ages 15-25) to develop and implement a service-learning project about climate change.
http://redwhateandgreen.org/

GreenWorks! Grants
The service learning grant program *'GreenWorks!'* from Project Learning Tree® (PLT) helps to fund neighborhood environmental improvement projects that partner PLT educators and their students with local businesses or community organizations.
http://www.plt.org/cms/pages/21_22_18.html

Environmental Excellence Awards
International Paper in partnership with the Conservation Fund annual awards honor the conservation accomplishments of two individuals. The Conservation Partnership Award recognizes an individual who has achieved significant results in the protection of habitat through a cooperative relationship with a business or company. The Environmental Education Award honors an educator who has developed an innovative approach to environmental education. Each Award is accompanied by an unrestricted $10,000 grant.
http://www.conservationfund.org/?article=2331

Busch Systems Design Contest
Busch Systems is inviting participation in the design of a new product line. Is there a feature you've always wanted to see incorporated into a recycling container? What about a new-style container for your on-campus recycling program? The winner will be awarded $1,000 toward their recycling program.
http://www.buschsystems.com/designcontest.html

"Leave No Trace" Center for Outdoor Ethics
http://lnt.org/programs/grants.php

Appendix 7 Current Courses[173] at Westfield State College that include sustainability issues and concepts

BIOLOGY DEPARTMENT

- BIOL 0102 - Environmental Biology: A core class that deals with basic environmental issues and problems. Students are encouraged to take action in support of environmental initiatives.
- BIOL 0202 - Conservation Biology: The whole class revolves around environmental issues – what they are and how we can solve problems.
- BIOL 0233 - Environmental Legislation: Analyzes current state and federal legislation related to the environment.
- BIOL 0206 - Plants & Human Society: Students will explore the relationship between plants and humans.

ENVIRONMENTAL SCIENCE DEPARTMENT

- ENVS 0238 - Environmental Impact Analysis: This course covers the geographic, social, and economic impact of land use projects on the natural environment.
- ENVS 0352 - Planning Green Sustainable Cities: This course focuses on green sustainable cities' planning concepts and initiatives.

GEOGRAPHY AND REGIONAL PLANNING DEPARTMENT

- GARP 0105 - Introduction to Community Planning: Several units on sustainability and environmental issues are included.
- GARP 0391 - Seminar in Regional and Environmental Planning: Students conduct research on sustainability topics and develop plans that address environmental issues related to land planning.
- GARP 0106 - Introduction to Environmental Analysis: Introduces the interaction between human and environmental systems.
- GARP 0217 - Global Issues of the Future: Explores a variety of issues confronting global society today.
- GARP 0239 - Climate Change: An Allied Science core class that explores the climate system, climate change, climate impacts, vulnerabilities, and solutions.

PHILOSOPHY DEPARTMENT

- PHIL 0101 - Introduction to Social and Political Philosophy: Students discuss global sustainability issues when analyzing Octavio Pax's critique of Mexican and 3rd World political institutions.
- PHIL 0217 - Political Philosophy and Film: Some of the movies and essays considered raise sustainability issues.

COMMUNICATION DEPARTMENT

- MCOM 0312 - Media Criticism: The textbook used was Cynthia Chris' "Watching Wildlife" which discusses TV wildlife shows from an eco-feminist perspective.

[173] This list (cf. Section 4.4.1) was compiled from faculty responses to an informal email survey conducted in April 2008.

- MCOM 0306 - International Communication: Using the documentary, Darwin's Nightmare, students discussed the effects of globalization on environmental/traditional livelihoods.
- Environmental Communication.

MOVEMENT SCIENCE DEPARTMENT

- MOVP 0108 - Principles of Health and Wellness: Students discuss "green" issues such as nutrition and organic foods, substance abuse, and environmental health.
- MOVP 0100 - Intro to Exercise Science: Discussions occur on the influence of the environment on physical activity.

GENERAL SCIENCE DEPARTMENT

- GNSC 330 - Science, Technology, and Society: This course includes a unit on environmental issues such as air pollution, water pollution, global warming, and alternative energy sources.

WOMEN'S STUDIES DEPARTMENT

- WSTP 0101 - Introduction to Women's Studies: Includes a unit on women and the environment.

EDUCATION COURSES (Interdisciplinary)

- IDIS 0360 - Elementary Math and Science: This course provides a unit on science and technology for children. Students examine lesson ideas for children that address environmental issues.
- EDUC 0311 - Social Studies Methods for Elementary Teachers. Students in this class create lessons on environmental issues that they can teach in elementary classrooms.
- HIST 0298 - Methods of Teaching History: Middle & Secondary Levels: Students learn about the dearth of information in social studies texts, etc. on environmental issues. Students read material about teaching environmental issues.
- HIST 0120 - The History Teacher: Students learn about conflicts in global warming, etc through readings.

Appendix 8 Recommended permanent Sustainability Committee: Charge and Membership[174]

The permanent Sustainability Committee at Westfield State College (cf. Section 5.1) should be charged with implementation and oversight, including:

- Monitoring, coordinating, and implementing campus sustainability efforts.
- Coordination of campus-wide education efforts.
- Collaboration with student groups to promote sustainability.

The permanent Sustainability Committee at Westfield State College has to include a diverse representation of the college community, consisting of:

- Campus Sustainability Coordinator
- Four staff members (representing Residential Life, Marketing/Public Relations, Facilities and Operations, and Presidents Office)[175]
- Four faculty members
- Four student members

Members of the community should be invited and encouraged to participate.

[174] Section 5.1
[175] Communication is a critical part of sustainability (cf. Section 4.2.1).

Appendix 9 ACUPCC Seven Tangible Actions: Ranking and Discussion[176]

The sustainability committee rank-ordered and evaluated the seven tangible actions included in the ACUPCC in a (reversed) Top-Seven List to emphasize the need for a comprehensive, multi-facetted approach that incorporates an array of sustainability strategies[177] as soon as possible (cf. Section 5.3).

The Campus Sustainability Coordinator should be tasked with organizing the initiations and implementation of the seven tangible actions included in the ACUPCC, using the ranking presented below to optimize resource allocation.

1) Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.
This recommendation builds upon the already existing free/low-cost public transportation[178] options at Westfield State College (cf. Section 4.2.3). However, we recommend broadening the action from its focus on public transportation to sustainable college transportation in general.

Under the ACUPCC, the public transportation action requires that the institution provide free or heavily subsidized public transportation passes to students, faculty, and staff – merely encouraging the use of public transportation is insufficient.

The sustainability committee recommends the immediate evaluation and implementation of the following strategies to improve sustainable transportation for the college community:

- Extension of free/low-cost ridership on all PVTA buses across the entire PVTA route network.
- Negotiation with the PVTA to increase the frequency of the R-10 bus service to half-hourly.
- Encouragement of car-pooling and ride-sharing by offering preferred parking.
- Education and information campaign.
- Creation of a bike-friendly campus, especially for travel between 333 and the main campus.
- Promoting the creation of bike paths to connect the campus and downtown Westfield along Western Avenue by the Presidents Office.

2) Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.
This recommendation is particularly important, as it requires campus-wide participation, especially from the students living in the residence halls. Westfield State College already operates an effective recycling program, which can be improved by the following recommendations and suggestions:

- Establishment of the *'Green Dorm'*, slated for Fall 2008, as a test facility for new recycling initiatives and procedures.

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[176] Section 5.3
[177] The ACUPCC Implementation Guide contains a series of specific requirements, recommendations, suggestions, and resources for each of the seven tangible actions.
http://www.presidentsclimatecommitment.org/html/solutions.php
[178] All WSC faculty and staff are eligible to use the PVTA R-10 and B-23 routes for $7 per semester and $7 for the summer (i.e. $21 per year). This service is free for students.

- Establishment of an *'Eco-Rep'* Program[179] for peer outreach education in the residence halls (cf. Section 4.6.2).
- Waste minimization and recycling measures need to be implemented or improved throughout all aspects of Dining Services on campus (cf. Section 4.2.4).
- Large potential for waste minimization and recycling exist at athletic events with respect to concessions operations. This would send a very positive signal to the community and establish Westfield State College as a leader in waste minimization and recycling.
- Installation of effective, consistent recycling containers across campus.

RecycleMania[180] is a friendly competition among colleges and universities to see which schools can collect the most recyclables over a 10-week period. Founded in 2001, the program has been extremely successful, with the number of participants nearly doubling each year. RecycleMania is supported by the U.S. Environmental Protection Agency's WasteWise program and the National Recycling Coalition (NRC), and is coordinated as a project of NRC's College and University Recycling Council (CURC). The Coca-Cola Company is a major sponsor of RecycleMania.

3) Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.
This recommendation effectively *'double-dips'* with our obligations under Executive Order #484 (cf. Section 1.3.1) and provides a clear and measurable reduction in our greenhouse gas emissions. The ACUPCC allows the following four strategies to increase the (relative) consumption of renewable electricity on campus:

1) Installation of onsite renewable electricity generating devices.
2) Purchasing of renewable electricity produced off-site, but directly connected to the campus.
3) Purchasing of renewable energy credits (RECs, also known as *Green Tags*)
4) Any combination of 1), 2), and 3) as long as 15 percent or more of our electricity consumption is derived either directly or indirectly from renewable energy.

Executive Order No. 484 (cf. Appendix 2) explicitly allows state agencies to use RECs as a renewable energy strategy. An approximate cost calculation is included in Table 3.

RECs are tradable environmental commodities that represent proof that electricity was generated from a renewable energy resource. For the customer, RECs represent a method to selectively purchase renewable energy from the 'mixed' electricity delivered by the utility company. Under the ACUPCC, purchased RECs must be Green-e certified[181].

4) Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.
It is the understanding of the sustainability committee that such a policy is already in place at Westfield State College. However, we recommend that the colleges adopts a formal, written policy[182] stating our intention to purchase ENERGY STAR certified products[183] in all areas for which such ratings exist.

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[179] Sustainability: The Journal of Record, 2008, 1(1), 57-72: http://www.liebertonline.com/sus.
[180] http://www.recyclemaniacs.org/Index.htm
[181] Green-e certification ensures that RECs meet strict environmental and consumer protection standards: http://www.green-e.org/
[182] Examples: http://www.presidentsclimatecommitment.org/html/solutions.php

This policy statement should also include the charge to the college community to make sustainability and energy efficiency an integral part of any procurement and purchasing decision on campus.

Table 3 Estimated costs for renewable energy using RECs.

Goal	FY 2007 (MWh)	Cost (per MWh)	Cost for RECs (per year)	Percentage of FY 2007 Electricity Costs
15% renewable	2,100	~$9	$18,900	~0.01%
30% renewable	4,199	~$9	$37,791	~0.02%
100% renewable	13,988	~$9	$125,892	~0.07%

Notes

- 15 percent (by 2012) and 30 percent (by 2020) renewable energy sources are mandated by Executive Order No. 484 (cf. Section 1.3.1). 100 percent renewable energy sources reflect the ultimate goal of the ACUPCC: climate neutrality (cf. Section 1.3.2)
- The cost of about $9 (per MWh) is from www.nativeenergy.com, the carbon offset provider for the book and movie *An Inconvenient Truth* and for Al Gore's travel[184].
- Electricity consumption and costs from Table 1 (cf. Section 4.3.2).

5) Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.

It is the understanding of the sustainability committee that the Commonwealth of Massachusetts already mandates LEED[185] Platinum standard for all new campus construction. Nevertheless, we recommend that Westfield State College adopts a formal, written policy to that effect.

It is worth noting that the ACUPCC Implementation guide encourages Westfield State College to apply for LEED certification, but an internal evaluation system to ensure all new buildings meet (at least) LEED Silver standards is also permissible.

6) Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.

To achieve this option under the ACUPCC, Westfield State College has to adopt a formal, written policy stating our intent to purchase carbon offsets for campus air travel. The ACUPCC permits a simple calculation of total air travel miles by dividing the total amount spent on air travel by a factor of $0.25 per passenger air mile.

It is reasonable to assume that college air travel will increase in the future with our broader international orientation. This will increase our greenhouse gas emissions and the costs associated with offsetting them. For example, the recent trip to Doha (Qatar) by 11 members of the Westfield State College community would have cost $1,000 to $3,000 to render climate neutral.

The ACUPCC Implementation Guide and the Tufts University Climate Initiative[186] provide excellent resources about air travel, greenhouse gas emissions, and associated offset options.

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[183] http://www.energystar.gov/index.cfm?c=higher_ed.bus_highereducation
[184] http://www.nativeenergy.com/pages/an_inconvenient_truth/29.php
[185] http://www.usgbc.org/
[186] http://www.tufts.edu/tie/tci/index.htm

7) Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.
The ACUPCC suggests the establishment of an advisory committee[187] on responsible investment with student and faculty participation to review and make recommendations on climate-related shareholder resolutions at companies in which the signatory's endowment[188] is invested. Signatories are also encouraged to incorporate other climate-friendly investment strategies – such as direct shareholder engagement with major greenhouse gas emitters and positive investments in climate-friendly technologies and investment funds – into their policies and/or the charges to their advisory committees.

[187] http://www.endowmentethics.org/
[188] http://www.endowmentinstitute.org/