Framingham State University

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Introduction

This 2011 update of Framingham State University's Climate Action Plan report is transmitted on behalf of Timothy J. Flanagan, PhD, President of Framingham State University.

In April of 2007, Massachusetts Governor Deval Patrick issued Executive Order No. 484 mandating reductions in greenhouse gas emissions and energy consumption for all state agencies and institutions.

In May of 2007, Framingham State University became one of the signatories of the American College and University Presidents Climate Commitment (ACUPCC), the ultimate goal of which is the elimination of carbon emissions from higher education campuses and infusion of sustainability into the curriculum and operation of the campus.

Global climate change is the consummate challenge of the 21st century. In 2007, the United Nations Intergovernmental Panel on Climate Change (IPCC) released its most updated and comprehensive report on climate change. The IPCC is the science authority for the United Nations Framework Convention on Climate Change and is generally regarded throughout the international community as the authority on climate change.

The IPCC periodically produces extensive reports on the risks of climate change with the 4th Assessment Report (AR4) released in 2007. The report took six years to complete and involved over 3,000 authors and scientific reviewers. It states "warming of the climate system is unequivocal" and that anthropogenic activity is very likely to have contributed to this warming.[1]

The addition of greenhouse gases (GHG) from anthropogenic sources (such as fossil fuel combustion) has increased total atmospheric GHG concentrations to well above natural levels. According to the IPCC the concentrations of such greenhouse gases as carbon dioxide, methane, and nitrous oxide have all drastically increased since pre-industrial levels as a result of human activity. For example, the global atmospheric concentration of carbon dioxide has risen from a pre-industrial level of 280 parts per million (ppm) to 379 ppm in 2005. This value is significantly elevated when compared to the natural range determined from ice cores, which fluctuated between 180 and 300 ppm over the past 650,000 years. This increase in GHG concentrations is very likely exacerbating global warming, resulting in global climate change.[2]

Changes in the earth's climate have been effectively linked to food shortages, species habitat loss and subsequent extinction, droughts, frequency and intensity of wildfires and storms, unpredictable weather patterns and rises in sea level. It is incumbent upon all nations, institutions, businesses and individuals to act in a responsible manner in addressing these issues for the greater good as well as for their own self interest.

Framingham State University is committed to mitigating its contribution to this global dilemma by adopting new policies and procedures designed for reducing our carbon footprint, promoting a healthier community, and providing an educational model to prepare students for their futures in a new economy as well as for their roles as responsible stewards of their communities.

In the summer of 2007 the writing of this Plan was started by the Facilities office. A carbon inventory was completed using the Clean Air Cool Planet carbon calculator. Various interest groups in the university participated in the vetting of the report,

including the Environmental Subcommittee of the Facilities Strategic Planning Committee, student clubs, and staff groups. Each of these interest groups works to coordinate efforts, develop action items, and implement recommendations of the CAP.

In adopting this Climate Action Plan, Framingham State University recognizes its responsibility to not only adhere to the deadlines and conform to the expectations of these obligations, but to lead by example in providing for a holistic and sustainable educational environment for students, faculty and staff.

Participants in the authoring of this Plan include:

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1. IPCC 4th Assessment Report, Working Group 1, "Summary for Policymakers," p. 3, 5, http://www.ipcc.ch/.
2. IPCC AR4, Working Group 1, p. 2.

About this Action Plan

This Climate Action Plan describes the climate and environmental protection actions and policies planned for Framingham State University for the next four years. The plan includes a strong emphasis on reducing CO2 emissions and energy use as well as new policies intended for creating a sustainable, healthy, and inspirational environment for the campus community. The intention of these policies is to enhance responsible decision making, thoughtful discussion, and a holistic approach to this campus-wide concern.

The plan calls for new investment; consolidation of environmental campus concerns; changes in lifestyle; coordination of policies, purchasing and curricula; and for the university to improve the use of existing resources.

The actions described in this plan will allow for sustainable progress in effectively addressing the criteria laid out in Executive Order No. 484 as well as the mandates put forth by ACUPCC. The publication of this plan is intended to be just the beginning of this campus-wide endeavor. Progress will be measured and reported along the way, with a subsequent campus-wide appeal for community cooperation and communication to assist in the further structuring of this plan as well as its implementation. It is anticipated that this Climate Action Plan will be a dynamic document, with yearly edits and updates.

Greenhouse Gas Inventory

A greenhouse gas emissions inventory is essential to developing a Climate Action Plan. The inventory establishes baseline emissions and demonstrates trends in the university's emissions and energy use. Data from fuel consumption, electricity purchased, transportation habits and other categories were analysed to determine the "carbon footprint" for the university. Using the Clean Air-Cool Planet Carbon Calculator, emissions were determined for the fiscal years 2001-2008 (June 30-July 1).

The inventory includes both direct and indirect emissions resulting from various university activities including: fertilizer use, purchased electricity, on-campus steam generation, commuter habits, air travel, etc. According to the carbon calculator, these sources were divided into three scopes.

- **Scope 1** includes all direct sources of GHG emissions from sources that are owned or controlled by the institution including production of electricity, heat or steam; transportation of materials, products, waste, and community members; and fugitive emissions from unintentional leaks.

- **Scope 2** includes GHG emissions from imports of electricity, heat or steam associated with the generation of imported sources of energy.

- **Scope 3** includes all other indirect sources of GHG emissions that may result from the activities of the institution but occur from sources owned or controlled by another company such as air travel, outsourced activities and contracts, emissions from waste generated by the institution when the GHG emissions occur at a facility controlled by another company (i.e. methane emissions from landfill waste), and commuting habits of community members. The main contributor to Scope 3 emissions at Framingham State University is commuting to and from the university by faculty, staff, and students.

The combined total of these categories represent the total GHG emissions from university activities.

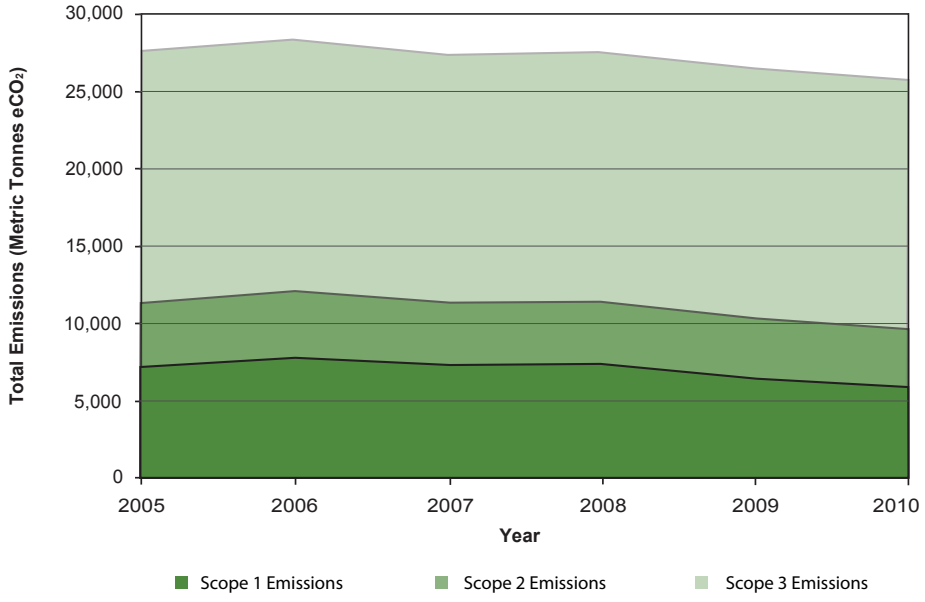
The most significant sources of GHG emissions were derived from three major sources:

- Commuting by Faculty, staff and students (Scope 3)
- On-Campus steam generation (Scope 1)
- Purchased electricity (Scope 2)

Chart 1: Total Emissions of Metric Tonnes of eCO_2 From 2010

	2010	Energy Consumption	CO_2	CH_4	N_2O	eCO_2
		MMBtu	kg	kg	kg	Metric Tonnes
Scope 1	Co-gen Electricity	-	-	-	-	-
Scope 1	Co-gen Steam	-	-	-	-	-
Scope 1	Other On-Campus Stationary	72,916.6	5,497,109.0	730.5	42.3	5,528.0
Scope 1	Direct Transportation	4,232.3	296,744.3	59.4	20.4	304.3
Scope 1	Refridgerants & Chemicals	-	-	-	-	-
Scope 1	Agriculture	-	-	-	-	-
Scope 2	Purchased Electricity	66,634.9	5,509,796.3	46.0	79.6	5,534.7
Scope 2	Purchased Steam/Chilled Water	-	-	-	-	-
Scope 3	Faculty/Staff Commuting	17,978.9	1,260,688.8	252.2	86.8.6	1,292.9
Scope 3	Student Commuting	199,453.2	13,985,766.3	2,797.6	962.9	14,342.7
Scope 3	Directly Financed Air Travel	571.3	112,167.6	1.1	1.3	112.6
Scope 3	Other Directly Financed Travel	-	-	-	-	-
Scope 3	Study Abroad Air Travel	-	-	-	-	-
Scope 3	Solid Waste	-	(9,863.3)	-	-	(9.9)
Scope 3	Wastewater	-	-	-	-	-
Scope 3	Paper	-	-	-	-	-
Scope 3	Scope 2 T&D Losses	6,590.3	544,924.9	4.6	7.9	547.4
	Additional					-
	Non-Additional					-
	Scope 1	77,148.9	5,793,883.3	789.8	75.7	5,836.2
	Scope 2	66,643.9	5,509,796.3	46.0	79.6	5,534.7
	Scope 3	224,593.7	15,893,684.2	3,055.4	1,058.8	16,285.6
	All Scopes	368,377.4	27,197,363.8	3,891.2	1,214.1	27,656.4
	All Offsets					-
					Net Emissions:	27,656.4

Graph 1: Total Emissions of Metric Tonnes of eCO_2 From 2005 to 2010



Overview of Course of Action

Massachusetts Executive Order No. 484 mandates Scope 1 and Scope 2 GHG reductions, measured on an absolute basis of:

- 25% below FY 2002 baseline by FY 2012
- 40% by FY 2020
- 80% by 2050

Additionally, the Order mandates overall energy reductions, calculated on a basis of BTUH per square foot building area, of:

- 20% below FY 2004 baseline by FY 2012
- 35% by 2020

The American College and University President's Climate Commitment further requires the university to meet certain criteria in an effort to become a more sustainable campus.

GHG reductions will be measured on an absolute basis and not adjusted for facility expansion or load growth. Energy reductions shall be based on a Fiscal Year 2004 baseline and measured on a BTU per square foot basis. Therefore, to comply with these standards, Framingham State University must enact a comprehensive and holistic initiative addressing many aspects of the university community.

The Framingham State University Climate Action Plan is composed of 15 major action points. Each point will include a discussion on: identification of the issue, proposed solutions, and anticipated benefits. Progress will be measured from a quantitative and qualitative perspective, depending on the proposed action.

The points are divided into three basic energy and GHG reduction categories: general campus policies; upgrades and projects; and lifestyle changes for students, staff, faculty and administration.

Implementation of the action items of the plan will be the joint responsibility of the Facilities Department and the university President. However, the cooperation and support of the entire university community will be essential.

A student organization, The Green Team, has been assembled to coordinate student involvement and to help facilitate new policies involving student lifestyle changes campus-wide.

Highlights

This Climate Action Plan calls for creating and effectively coordinating policies that will reduce the campus carbon footprint, create campus-wide policies that will enhance and support sustainable endeavors, and create educational opportunities that will enrich and expand the backgrounds of the students.

The plan is basically divided into three sections:

- Because of the exigency in reducing greenhouse gases, Actions 1- 6 deal primarily with both structural investment and policy matters that have a direct correlation to reducing both CO2 emissions and energy demand.

- Actions 7-13 are more policy oriented, addressing the need to conserve and protect all campus natural resources. These actions mandate little if any financial cost to the university, but suggest lifestyle changes that can significantly enhance the sustainable programs of the university.

- Actions 14-15 promote the importance of the educational aspects essential for the plan to be comprehensive, holistic and representative; thus allowing it to fulfill its pedagogical objective.

Action # 1: Conversion of the Power Plant and Other Upgrades

The ISSUE is that the current power plant boilers, which produce the steam used for heating and cooling 95% of the campus, while dependable, are 48 years old, antiquated, and burn #6 heating oil. Number 6 heating oil is very high in GHG emissions and the plant emits approximately 7,000 metric tons of CO2 per year. This is the second leading contributor to the campus carbon footprint.

The SOLUTION will be to convert the power plant to a cleaner burning fuel, to disperse the heating and cooling generation to several areas of the campus creating less dependence on a single source while incorporating new technology, and adopting policies that demand less fuel consumption. Although alternative energy sources may be preferable in a long range plan, conversion from #6 oil to natural gas is currently the most feasible immediate solution. Natural gas is currently available in the public streets adjacent to the campus.

Converting the boilers to natural gas would cost an estimated $1.9 million dollars and would reduce CO2 emissions by 2,061 metric tons per year, a 30% reduction. Offsets for this expense would be realized from an estimated increase in energy efficiency of 10% yearly.

Additionally a project is underway to replace the existing steam fired absorption chiller that currently serves the McCarthy Center with electric chillers. This will reduce the demand from the power plant and is part of an effort to convert all campus steam chillers to electric chillers, allowing the power plant to be off-line during the summer. Other policy changes regarding energy efficiency would also reduce the demand on the power plant and will be discussed in subsequent sections of the plan.

The BENEFITS of converting the power plant to natural gas would have a direct, measurable and significant effect on the campus carbon footprint, reducing the GHG emissions by 2,061 metric tons annually accounting for a 30% reduction in the second largest contributing category.

Goal For FY 2010-11:

To pursue funding for conversion of power plant to natural gas.

Progress April 2009 through April 2011:

- The university has submitted a request for federal stimulus funding and is waiting for potential approval.
- Alternative funding is being explored in the event stimulus money is unavailable.
- A study has begun as to the feasibility of replacing the power plant. The Energy Efficiency and Sustainable Building Group of the Department of Capital Asset Management have agreed to initiate a study for a Comprehensive Performance Contract that will consider both upgrades to the power plant and other energy reduction projects on campus.
- An energy performance investment grade audit is currently being conducted by DCAM to determine the cost and feasibility of converting the boiler plant fuel burners from #6 oil to natural gas.

Action #2: Increase Use of Renewable Sources to 25% of Total Purchased Electricity Portfolio

The ISSUE is that all electricity used at the university is currently produced off site. Framingham State University consumed 9,521,349 kWh of electricity at a cost of $1,420,870 in FY 2008. Of the amount of electricity purchased, only .01% was derived from renewable sources. Electricity purchases account for the third leading contributor to our carbon footprint producing 4,141 metric tons of CO2e.

The SOLUTION is to covert our electricity portfolio to allow for a portion of our purchased power to be produced from renewable sources. Currently the most feasible of these sources is wind energy. Our electricity provider offers an option in which a portion of the purchased electricity can be derived from a wind farm in upstate New York. This choice would cost the university .837 cents per kWh. At current usage rates, and a 25% purchase target, that would be an added expense to the school of $40,323. It would cut CO2 emissions by 1,035 metric tons, a decrease of 25%.

Offsets for this expense will be derived from several sources to be discussed in other sections of the plan, but basically by adding on-campus renewable sources, combined with new conservation policies and procedures, the university intends to decrease its electricity demand by 10%, realizing a savings of approximately $142,087 at current rates. This reduction could be attained by a combination of:

- lighting reductions in hallways and exterior of buildings
- campus-wide computer power management
- reduction in weekend use of buildings for non-direct campus use
- elimination of microwave ovens except in dining services and food labs
- increased awareness of personal responsibility for turning off office, dorm, and classroom lights when leaving
- reduction in photocopy use
- systematic replacement of all motors on campus with ultra high efficiency motors
- elimination of FAX machines on campus
- efforts in food services to reduce dish washing
- elimination of parking lot control gates

Although lifestyle changes may be slightly altered by conservation plans, the economic and environmental BENEFITS of reducing emissions by 1,045 metric tons, a reduction of 25%, coupled with the move toward energy independence should provide incentives to offset any perceived inconveniences.

Goal For FY 2010-11:

To achieve the goal of 25% of electricity being produced by renewable sources.

Progress April 2009 through April 2011:

This has been postponed until new dorm is built in order to achieve LEED certification points for that project.

- ✔ Have a proposal in hand to purchase Renewable Energy Certificates for $16,900 to achieve 25% renewable electric.
- ✔ Completed new PV installations scheduled for the Athletic Center and McCarthy Center and the new residence hall geothermal well will generate energy credits counting towards 25% renewable source target.

Action #3: Effectively Address the Transportation Issues Contributing to Emissions and Congestion

The ISSUE is that 70% of the university staff, faculty, and students commute to the university. This provides for an estimated 15,991 metric tons of CO2 emissions as well as traffic congestion and parking issues that not only affect campus and surrounding community environments, but the quality of life on campus as well.

The SOLUTION to this problem is complex and requires the coordination of policy changes in several aspects of campus planning. The goal of this plan is to reduce campus related traffic by 20%. This will be accomplished through a combination of several policy changes including:

- Rescheduling of class offerings to accommodate less commuting to and from school for students and faculty. This may be accomplished by more efficient use of classroom scheduling, a more aggressive approach to using the 4:30 teaching block, and improving access between the day and evening schools. If effective coordination of these and other proposals could result in an efficient class consolidation schedule, this could potentially reduce each commuter's trips by 20%

- Promote carpooling for students. Currently there are no viable incentives for carpooling. It is largely viewed as inconvenient, with scheduling differences accounting for a significant concern. If the scheduling of classes were condensed, this could address a portion of that concern. The initiation of a parking fee may also act as an incentive for carpooling (a deterrent for not carpooling). The fee would also help offset costs for new green, on-campus initiatives. Students who did carpool, and registered as carpoolers, would have their fee waived and would be provided with preferential and guaranteed parking.

- More efficient use of the campus shuttle bus with a goal of removing one bus off line. The shuttle services need to be reevaluated to delineate between what is a necessity and what is simply a convenience. Once scheduling is reevaluated, the mode of transportation needs to be examined. The prospects of a more efficient vehicle need to be considered. There are concerns regarding student jobs associated with the shuttle, but these jobs could be reassigned to other duties on campus.

- Increasing access to rail service. The fact that Framingham State University is adjacent to a rail line, a feasibility study needs to be updated to consider how many commuters would be accommodated by rail service, and how cost effective it would be to negotiate a link to the current commuter lines in Framingham.

- More efficient use of the Campus Police fleet. The relative size of the campus may lend itself to more foot patrol and bicycle patrols, particularly in warm weather months. The energy efficiency of the fleet will be taken into consideration. Are hybrids or electric vehicles an option? One recently purchased police vehicle by the university in 2008 was a Ford Escape hybrid.

- Reduce campus fleet overall and establish a no-idling policy for all university and guest vehicles
- Promote ride share programs like zipride.com
- Provide covered bike racks and storage and rent free bikes for students to borrow
- Do not allow freshmen resident students to have a car on campus
- Adding online and hybrid courses

The BENEFITS of addressing an effective and coordinated approach to these and other policy changes would include: saving an estimated 3,468 metric tons in CO2 emissions, significantly reduction in our largest GHG source; reducing traffic congestion on campus and providing for a healthier quality of life campus-wide.

Goal For FY 2010-11:

To broaden our car pool participation, continue to make campus vehicle use more efficient, and to reduce commuting by 20% through expansion of course offerings allowing for more flexible class scheduling.

Progress April 2009 through April 2011:

- ✔ A campus Green Fee has been proposed for AY 2011 (beginning fall 2010). This fee will help fund campus-wide green projects.
- ✔ A new car pool decal and lot has been established for AY 2010. There are currently 65 people enrolled in the program.
- ✔ A new campus shuttle schedule has been implemented which eliminates approximately 20 % of the current route saving the university an estimated $7000. in gasoline while reducing greenhouse gases by 20%.
- ✔ The shuttle kiosk has been moved from the center of the campus and replaced by 2 bicycle racks.
- ✔ Use of the Campus Police fleet has been reevaluated to increase bike and foot patrols. If adhered to this could also reduce fuel costs and emissions by 20%. 58 hours of bike patrol were recorded for September, 2009.
- ✔ A meeting has taken place with MWRTA to discuss scheduled runs to the Union Avenue lot as well as other adjustments allowing for potential further reductions in the campus shuttle schedule in 2010-2011.
- ✔ 6:30 time blocks have been created to allow day students more flexibility in choosing their classes allowing for less commuting days.
- ✔ Several meetings have been conducted with MWRTA to evaluate expansion of service to the Union Avenue allowing for further adjustments in campus shuttle runs.

Action #4: Increase Building Energy Efficiency

The ISSUE is that many of the campus buildings are old and were not built to today's standards for energy efficiency.

The SOLUTION is to improve on the structures wherever possible to decrease energy waste, and to employ campus-wide policies designed to make the most efficient use of the structures that are in place.

A campus-wide inventory of doors, windows, and other portals should be conducted to identify the obvious sources of inefficiency. Once completed, these issues can be addressed, the costs being partially offset by increased savings in energy costs.

A policy should be adopted mandating that lights be turned off in rooms that are not in use. This is a lifestyle change that, similar to recycling, may take extra effort initially. But with effective implementation it can promote significant decreases in energy demand at no cost added to the university.

The use of university facilities in general, particularly those events that are non-university related, should be closely scrutinized as to their effect on the university both economically and as to energy use.

The school semester calendar should also take into account the efficiency of building use with regard to the heating and cooling requirements for all buildings.

All new building structures should be Leadership in Energy and Environmental Design (LEED) certified.

Feasibility studies regarding the use of renewable energy sources campus-wide have been arranged. This will be addressed in a separate section.

Framingham State University currently employs policies that are energy conscious. For instance, all use of incandescent light bulbs have been eliminated and replaced with fluorescent lighting. An energy management system has been put into place in an attempt to control the temperature extremes in those buildings that are equipped with both heating and cooling systems.

The BENEFITS of adherence to these policies would include a decrease in campus energy consumption, allowing for lower energy costs, as well as a decrease in GHG emissions. These policies can also be employed, in many instances, with minimal cost to the university.

Goal For FY 2010-11:
To implement energy saving improvement through resources derived from the green commuter parking fee.

Progress April 2009 through April 2011:

- $100,000 has been designated for energy reduction projects
- A campus-wide student energy and water conservation contest was conducted between the residence halls in November 2009 resulting in a savings of 7,546 KwH and 434,130 gallons of water translating into a savings of close to $9,000 for the university. This will become an annual event.
- A directive has been initiated to facilities staff to turn off all non-essential lighting while rooms are not in use.
- The steam chiller has been replaced in the McCarthy Center with modular high-efficiency electric chillers.
- A new central chiller (to replace the Hemenway Hall chiller) is being studied by DCAM with construction anticipated for summer 2011.
- The new residence hall study phase has identified LEED Silver certification designation as a goal for the project.
- The air-conditioning pumps in the McCarthy Center and the heating pumps in Larned Hall have been replaced by

more energy efficient pumps.

- An energy investment grade audit of the entire campus has been ordered that will outline an array of energy saving measures.

Action #5: Make Dining Services as Energy and Food Efficient as Possible

The ISSUE is that, by nature, a large dining facility will produce large amounts of waste and consume large amounts of energy.

The SOLUTION is to implement as many policies as possible that will reduce and reuse the energy and waste consumed and created in operating such a facility.

The dining services at Framingham State University have already implemented several policies that are environmentally responsible. Among them are: a commitment to replace aging appliances with Energy Star certified appliances, and a policy that provides a discount of ten cents per beverage when using a reusable mug. Food services also employs policies of buying locally when possible, reducing delivery dates, and recycling of kitchen oil which is currently converted to bio-fuel and being reused in 2 campus buildings.

Currently all chemicals used by dining services are Green Seal Certified and a new Apex ware washing program has been employed which allows for savings of 30,113 gallons of water and 16,863 kWh's of electricity over the previous program.

Dining services is also committed to monitoring food origins in an effort to eliminate the support of factory farms which produce significant amounts of greenhouse gases and threaten water supplies.

Currently there are three new policies under consideration by the dining services. They are the conversion from Styrofoam plates to recycled paper products, campus-wide composting, and "trayless" days in the dining commons.

- The conversion from Styrofoam remains an economic issue. The cost to convert to bio-degradable products creates an increase of 84% over traditional products. This would result in a price increase of 9% if passed along to the consumer in addition to any inflationary increases that would occur to offset food, prices, currently 4-5%. A means of deferring that increase in cost is currently under consideration.

- Campus- wide composting would require the cooperation of students, faculty, and staff in sorting their waste material. However, this requires only behavioral changes and comes at no added expense to the university. Alternative sites for compost removal are currently being explored.

- Experience has shown that when trays are removed from dining locations, less food is wasted, less energy is consumed, and water and detergent use decreases. Dining services is considering the implementation of "Trayless Fridays" in Fall 2009. This practice will expand as the practice becomes more commonplace. Once again, this policy will require behavioral changes and cooperation, but creates no added expense to the university.

The BENEFITS of these policy changes are that they are relatively inexpensive, help to reduce consumption of energy and other resources, provide for a more responsible dining experience and require only the cooperation of the clientele.

Goal For FY 2010-11:

To redesign dining services allowing for compaction of all wastes, thus reducing water use, promoting compost, and reducing non-compostable items.

Progress April 2009 through April 2011:

- Reduced delivery frequency of vendors
- Worked with vendors to source products that are produced and grown locally.
- All Green Mountain paper cups are now EcoTainers.
- Encouraged use of travel mugs by offering discounts
- Transition to EcoLab APEX chemicals
- Recycle all waste oil from fryers to be converted to Bio-Diesel
- Converted napkin baskets to Xpressnap napkin dispensers.
- A meeting was conducted on August 4, 2009 with Sodexo to discuss Sustainable practices. Dining services went trayless as of January 2010. Eliminating this practice saves approximately 200,000 gallons of water per year and saves the school approximately $3,500.
- The university plans to be styrofoam-free by 2011 with a fully compostable dining area by 2012.
- Four water cooled coolers located in the McCarthy Center kitchen were replaced with new air cooled units, saving 547,500 gallons of water per year ($7,150.)
- Dining services has switched to completely compostable plates and utensils allowing all waste to be composted Every two weeks two 96-gallon compost bails are sent to a local farm to be recycled as compost.
- The dining area has been completely renovated to accommodate composting. Dining services reduced its water use by 1.8 million gallons in the last fiscal year saving approximately $33,000. This project was partially funded by the new student green fee.

Action #6: Increase the Use of Alternative Energy Sources

The ISSUE is that there are currently no on-campus uses of renewable energy sources. Energy independence from cleaner and more modern renewable sources is the wave of the future and the possible cornerstone of future economic development both statewide and at the national level. Other than the recent policy of recycling oil from dining services to bio-fuel to be used on campus, there are no active renewable energy sources on campus. As mentioned in Action 2, our current ratio for renewable in our purchase of electric power is .01%.

The SOLUTION is to increase the ratio of renewable energy sources for our purchased electricity and to actively pursue the feasibility of renewable energy sources on campus. A feasibility study is currently ongoing to confirm what possibilities may be available. Although the initial investment in wind energy would be substantial, there are currently state and federal grant opportunities available to the university to offset as much as 50% of the proposal.

Framingham State University is also involved in feasibility studies for solar energy to provide power to certain areas of the Athletic Center, the McCarthy Center as well as other buildings on campus. As with wind turbines, there will be an initial investment cost to adding solar panels, but once again state and federal grants are available to defray a large portion of those costs.

The BENEFITS of investing in wind and solar energy, coupled with the planned conversion of our renewable ratio regarding our electric power purchases, will serve to not only reduce our GHG emissions, but will reduce our dependence on fossil fuels, provide stimulation to a new green economy, and provide a working laboratory for our students who may be considering a career in the energy field post graduation.

Goal For FY 2010-11:

To add photovoltaic installations to the McCarthy Center and the Athletic Center.

Progress April 2009 through April 2011:

- The Energy Efficiency and Sustainable Building Group of the Department of Capital Asset Management have agreed to include the PV projects for the Athletic Center and the McCarthy Center in a larger statewide PV project scheduled for the Summer of 2010.
- Solar Photovoltaic systems have been added to the Athletic Center and the McCarthy Center. These systems will generate approximately 118 kW of electricity.

Action #7: Increase the University Recycling Ratio

The ISSUE is that the university's recycling percentage is currently 20%. The SOLUTION is to provide access for easier and more efficient recycling options and to create and implement an effective education curriculum campus-wide to encourage recycling by students, faculty and staff, with a recycling target goal of 50%.

The university currently recycles paper, plastic, toner cartridges, furniture, computers, florescent bulbs, telephones and batteries. Local firms have been hired to mitigate the transportation costs of recycling. Still the percentage of recycling is relatively low due in part to confusion as to what is recyclable and the availability of recycling receptacles.

Framingham State University initiated single stream recycling in September 2009, reducing the confusion of the recycling process . In June 2010, the university will begin a comprehensive recycling education program that will be a joint effort of Facilities and the Green Team.

As mentioned in Action 5, dining services is also considering the feasibility and logistics of implementing campus-wide composting in an effort to further address the solid waste issue.

The university has also implemented a new policy of ordering only recycled paper for photocopying and printing.

The BENEFITS of a more efficient recycling program are numerous. Recycling reduces demand for new raw materaials thereby reducing exploitation of natural resources. By conserving these resources we can help prevent exploitation through illegal harvesting, unsafe and unethical operations, and the unintended consequences of certain manufacturing and farming processes. Recycling also reduces the production of greenhouse gases and provides for a cleaner environment overall.

Goal For FY 2010-11:

To continue to pursue efficient and effective methods to increase our recycling percentage.

Progress April 2009 through April 2011:

- A centralized recycling station has been created on campus to encourage recycling and to promote sustainable practices on campus.
- The number and size of recycling container has increased with plans for further additions to the commuter cafeteria area.
- A truck load of fluorescent bulbs, computer equipment, and batteries were recycled in Fall 2010.
- 60 cubic yards of metal of metal products are recycled per semester.
- Every two weeks 2 96-gallon bails of compost are recycled to a local farm.

Action #8: Reduce Paper and Toner Use by 30%

The ISSUE is that global deforestation has contributed significantly to climate change and to the release of greenhouse gases. Clear-cutting of forests has led to loss of wildlife habitat, soil erosion, water pollution, and elevated CO2 levels. Genetically engineered forests, preferred by some paper companies for their fast growth rates and the fact that they are easier to process into paper, have been linked to the production of plant toxins resulting in trees that are pesticide resistant contributing to the evolution of resistant pests. Additionally, industrial timber forests often may not provide the same ecosystem services as natural stands.

The SOLUTION is to reject products that contribute to this environmental degradation. Framingham State University has committed to a policy of ordering recycled paper for purposes of photocopying and printing. Students, faculty and staff will be asked to print less, use online assignments when possible, converting business and student record functions to paperless electronic formats, and to actively participate in recycling their own paper waste.

The BENEFITS derived from this new policy are that it promotes sustainable forestry, saves energy by photocopying less, sustains the integrity of our forests, reduces the space required on campus for paper file storage and eventually reduces costs by reducing the demand for paper.

Goal For FY 2010-11:

To continue to consolidate our printing devices and to continue to encourage a decrease in paper use.

Progress April 2009 through April 2011:

- IT has conducted a printing assessment for the university community. This assessment has taken into account types of printers on campus, energy use, paper use, toner use, and associated costs. Suggestions have been made to decrease the 5,800,000 pieces of paper ($34,000) used campus-wide, as well as reductions in energy consumption, and toner usage ($70,500).
- Consolidated and standardized print devices, eliminating 80% of personal printers. Currently106 local printers and 7 network printers have been removed and replaced by 22 new network printers that are capable of double-sided printing.
- The Admissions office has converted to an electronic application process substantially reducing paper use.
- The combination of two sided printing, voluntary conservation, and network printing has reduced paper use significantly campus-wide.

Action #9: Decrease Campus Water Use

The ISSUE is that the world faces a global shortage of potable water. The combination of pollution, overuse, misuse, and climate change, has contributed to an increase in local, regionally, and worldwide water shortages, with the potential for an international crisis of a shortage of water fit for consumption.

The SOLUTION is to implement policies that promote water conservation and to provide educational tools to students, faculty and staff essential in promoting the urgency of this issue, and to provide the remedies available for addressing this issue.

The most obvious water source on the campus is the lawn sprinkler system. Although not the most demanding on campus water source, it attracts the most attention. The university has installed new water sensors that automatically turn off the sprinkler when there is adequate moisture. This prevents the system from functioning during rainy days as it did on the original automatic timing system.

The operation of dining services consumes a large volume of water. "Trayless" days and other attempts to use less water are currently under consideration at the McCarthy Center. The major sources of water consumption are the dormitories and the bathroom facilities in the Athletic Center and other classroom buildings. The general use of water in these facilities is unavoidable. However, conservations efforts (i.e. shorter showers, replacing leaky faucets) can have a significant impact on water consumption.

All new construction will consider incorporating rainwater collection, reuse of gray water, and low flow fixtures.

As with recycling and several other aspects of this plan, an effective education campaign will be adopted by the Facilities Department. With the assistance of The Green Team, the Facilities Department will be employed to assist in promoting responsible water use habits.

The BENEFITS of a sustainable potable water supply enhance not only the campus, but the entire community and beyond. These conservation methods also affect cost savings in the long run in that less water will be purchased from the town of Framingham.

Goal For FY 2010-11:
To use the Framingham State University Water Use Report as a guide in an attempt to decrease water use through conservation methods as well as improvements in dining services.

Progress April 2009 through April 2011:

- Going trayless and composting will create significant water savings. Going trayless will save an estimated 500 gallons of water daily. By going fully compostable in the (near) future, millions of gallons of water will be saved by eliminating use of the garbage disposal.
- An estimated 8.4 million gallons of water will be saved by refrigeration conversion in the dining hall creating a savings of $148,400.
- An estimated 200,000 gallons of water are saved by going trayless at a Savings of $3,300. to the university.

- A comprehensive review of campus water use has been completed to assist in addressing further water use issues and associated costs.
- Residence hall water savings findings.
- In November all residence hall washers and dryers were replaced with new equipment, saving 1.9 gallons of water per cycle. Our laundry vendor, MacGray, ran the savings against current usage data and found that on average we have saved approximately 3,283 gallons of water per month, and project savings of about 16,415 gallons this academic year as a result of the chageover. Over a full academic year, the savings is projected to be 26,264 gallons saved.
- We are installing stickers over the washing machine operation buttons which will visually identify cold/cold cycles with green stickers
- The dining facilities is being completely renovated to accommodate composting assisting in a decrease water use of 1.8 million gallons in 2010.

Action #10: Make More Efficient Use of Flexible Scheduling

The ISSUE is that it is often inconvenient for students and faculty to schedule their classes in a manner that is time and energy efficient. This often leads not only to commuting to school every weekday, but often several trips/times per day. It also renders carpooling an inconvenient option.

The SOLUTION would be to approach the class schedule from a holistic perspective allowing for more efficient use of underused scheduling blocks, a new perspective on the sequencing of courses, more flexibility in course requirements outside the major and the incorporation of more hybrid and online courses.

There are models that offer courses sequentially, present more efficient use of classroom space, allow for online student advising hours, and reduce campus congestion at certain peak times of day. The feasibility of these models should be given serious consideration.

The feasibility of other options including but not limited to: more aggressive course offerings during the 4:30 time block and scheduling of extended Friday block courses, bridging the gap between the day and evening schools and incorporating hybrid and online courses into appropriate sections of the curriculum, should also be thoroughly explored.

The BENEFITS to creative and flexible scheduling may lead to many students and faculty being able to reduce one day of commuting from their schedule helping to ease campus congestion, as well as contributing significantly to reducing the campus carbon footprint and attaining the goal set out in Action 3.

Goal For FY 2010-11:
To continue to develop and encourage methods for flexible scheduling offering the students an opportunity to decrease their commuting days.

Progress April 2009 through April 2011:

- A plan has been implemented to extend class offerings Monday-Thursday in the 4:30 block in an attempt to offer

students the chance to reduce commuting days by one day.

- A governance proposal has been approved by governance that will accommodate hybrid (mix of in-class and on- line) courses beginning AY2011.
- Class offerings for the 4:30 time block have been increased from 9 in Spring 2009 to 21 in Spring 2010 allowing for students to consolidate their schedules in order to reduce commuting and campus congestion.
- A proposal to add 5 day courses in a 6:30 time block for day students has been added to last years addition of 4:30 time blocks in an attempt to further reduce commuting days.

Action #11: Increase Campus Computer Efficiency

The ISSUE is that computer technology has a significant impact on the energy demands of the university. The SOLUTION is to implement policies that will assess current practices, and to incorporate efficient and cost effective computer services campus-wide.

A "cross-functional" team within Information Technology Services (ITS) has initiated a plan that will address ways to reduce printing, reduce power consumption, and evaluate the life cycle and management of hardware. Recommendations are being prioritized that include: project identification, a communications strategy, implementation plan, and an estimated cost of each of the above.

ITS has also initiated a comprehensive assessment of on-campus printing, how the data center is equipped and managed and an inventory of how computers and printers are currently recycled.

The BENEFITS of these policies include: a more responsible approach toward paper use, a more accurate accounting of the hardware cycle, and a reduction in energy demand contributing to the overall target for reductions as a campus community.

Goal For FY 2010-11:

To continue to evaluate the most energy and cost effective ways to coordinate IT campus-wide.

Progress April 2009 through April 2011:

- IT has activated the power management (or "sleep") features on desktop computers. This policy will potentially save 50,000 KwH's per year with a cost savings of $12,500.
- Server consolidation initiative.
- Recommendation to inform, educate, and provide the capability for faculty, staff, and students to eliminate the use of paper for 90% of daily printing.
- Provide campus-wide information on methods to convert to a paperless campus as much as possible. Seminars, web-based communication, posters, classroom discussion, etc.
- Hold instructional classes, webinars, and campus networked instruction on the use of electronic printing programs such as Adobe Acrobat Pro.
- Provide necessary software on each campus work station in order to print, edit, mark-up, sign, etc. electronically.

Action #12: Make Campus Grounds Keeping more Eco-Friendly

The ISSUE is that grounds keeping can be very energy-use intensive because of the use of motorized equipment. It also includes the application of chemicals, pottable water, and synthetic fertalizers. Groundskeeping on campus can also be noisy, produce dust, and may alter landscapes. However, it is essential for not only the appearance of the campus, but also the health and well-being of the campus community at large.

The SOLUTION is to identify and promote environmentally responsible practices and to schedule activities that do not conflict unduly with classroom activities, while supporting the health and wellbeing of student, faculty and staff campus-wide.

Currently the grounds keepers employ several environmentally friendly practices such as hand weeding, support of native plant species on campus, donating leaves to a local compost center and a ban on pesticide use.

However, snow and ice removal, grass cutting, and leaf removal, due in part to a limited staff to perform these tasks, often mandate the use of technology that is often noisy, odorous, and repugnant. Each task of grounds keeping should be re-examined to consider if there is a better alternative.

One example of this approach was implemented by the university in Fall 08. Leaf blower complaints have been a growing concern for years. Leaf blowers are loud, produce a noxious exhaust, and create a potential health hazard as studies have shown that the practice of blowing wet leaves can propel certain fungal spores airborne creating a potential health risk for humans and wildlife alike. Green Team volunteers offered to rake leaves in the quad and remove the leaves manually in exchange for not using leaf blowers in the quad area. The result was that the quad was kept clean, the campus community was spared the aggravation of the blowers, and some of the student body, faculty and administrators got some good exercise.

It is impractical to clean the entire campus in this manner, but this alliance of students and staff allowed for some relief to the busiest part of the campus from this perceived nuisance. Also, the more that faculty, students and administrators volunteer, the larger the effect of the program.

This is one small example of how effectively bringing all parties together in addressing policies can lead to a more acceptable solution. The BENEFITS of this approach to grounds keeping are that it accomplishes the goals of the university, alleviates the annoying aspects of grounds keeping, possibly provides student jobs and creates an opportunity for volunteerism and physical exercise.

Goal For FY 2010-11:
To consider all feasible alternatives to promote clean alternatives in campus grounds keeping.

Progress April 2009 through April 2011:

- ✔ Facilities will continue to support the Green Team in promoting awareness by providing hand rakes for leaves and hand mowers for mowing. The Green Team has adopted the quad area near Dwight Hall as motor free area to be maintained with rakes and hand mowers.

- A plan to perform a GIS inventory of campus trees has been proposed for Spring 2010.
- A directive was issued to maintenance workers to only have lights on in the rooms where they are actually working.

Action #13: Establish Environmentally Conscious Purchasing Policies

The ISSUE is that, although there has been a commitment by the university to adopt more responsible environmental policies and practices, there is currently no official mandate that governs a purchasing policy campus-wide with regard to environmental responsibility.

Currently the university requires all appliances purchased on campus and all appliances used by students in the residence halls to be Energy Star rated.

The SOLUTION is to adopt a campus policy which mandates that all purchases over and above a certain threshold, must, at a minimum, consider the cost benefit as well as the environmental benefit of any reasonably available sustainable alternatives.

The BENEFIT of such a directive is that it provides clarity and uniformity to the university's environmental practices with regard to significant purchases.

Goal For FY 2010-11:
To re-enforce the President's directive to consider sustainable alternatives in major campus purchases.

Progress April 2009 through April 2011:

- A purchasing policy directive has been implemented by President Flanagan instructing that sustainable products be considered whenever feasible .
- The policy instructing that sustainable products be considered when feasible was reissued by President Flanagan for the current academic year.

Action #14: Create a Campus Forum for Discussion of Sustainable Policies

The ISSUE is that there is not a uniform forum that allows for easy and effective access to campus environmental policy or to allow for effective exchange of ideas in assisting to create a policy which is coordinated, evolving, understood and implemented by the entire campus community.

The SOLUTION is to create a position that can coordinate the entire Climate Action Plan. This position would have the responsibilities of evaluating adherence to new policies; creating an effective dialog that interconnects facilities, administration, faculty and students; as well as developing an educational network that provides the campus community with information regarding present campus policies as well considerations for future policy issues.

This informational forum could be realized by incorporating a combination of web sites, contributions to campus publications such as, The Gatepost, Toilet Times, Campus Currents and open campus discussions.

The BENEFIT of creating this position would be to centralize all campus discussion of environmental policy issues from practical, theoretical, and pedagogical perspectives.

Goal For FY 2010-11:

To broaden participation in the Campus Forum and to broaden sustainable practices as a part of the teaching curriculum.

Progress April 2009 through April 2011:

- A position has been created to coordinate the implementation of The Climate Action Plan.
- A brown bag group has been created to informally discuss options for broadening the integration of climate change and other environmental concerns within the teaching curriculum. This is being coordinated by Dr. Vandana Singh and Dr. Larry McKenna.
- The environmental forum continues to meet monthly to discuss ways to increase environmental awareness campus-wide.
- A discussion of the Climate Action Plan was added to student orientation.

Action #15: Establish an Interdisciplinary Curriculum which Allows Each Department to Play an Active Role in the Creation and Implementation of the Climate Action Plan

The ISSUE is that there are now many approaches to addressing climate change which are often viewed as unrelated. The SOLUTION would be to provide access for each department to become involved in the discussions, contributions and applications of this plan. Readings, projects and other assignments regarding the relevance of the discipline to sustainability could be made available as a part of course and department curricula. The BENEFIT of using an interdisciplinary approach is that students would realize not only the relevance of their own discipline to the environment, but also the interconnectedness of global and regional environmental issues.

The university is currently finalizing an interdisciplinary Environmental Science major which incorporates aspects of eight disciplines in a holistic approach to environmental stewardship. To expand on this proposal would provide opportunities for the students, enhance the university curriculum, and maintain a service to the economic development of the community.

Goal For FY 2010-11:

To expand and promote the Environmental Science major and to create a graduate program in Sustainability.

Progress April 2009 through April 2011:

- A new Environmental Science major has been approved.
- The brown bag group will discuss options available for curriculum expansion and promote interdisciplinary lecture series.
- The Department of Graduate and Continuing Education, in conjunction with the Geography and Physics Departments, has created a new certificate program in Sustainable Development and Policy.
- The university is working with the town of Framingham to include FSC curriculum in the redesign and rehabilitation of Farm Pond.

Conclusion

Framingham State University has made a commitment to address global climate change. Executive Order No. 484 and President Flanagan's endorsement of the American College and University President's Climate Commitment combined with our responsibility as an institution of learning and our roles as responsible stewards of our environment have created a mandate for this Climate Action Plan.

The plan provides for a comprehensive and holistic approach to addressing our campus policies as well as an opportunity to discuss ways in which these policies may be changed or amended. The goal is a broader educational experience for the student, create a healthier and more sustainable working and learning environment for the campus community, and enable the university to act in a more responsible manner in its role as an institution of learning by effectively reducing its contribution to global natural resource depletion and climate change.

The adoption of Actions 1-3 would reduce CO2 emissions by an estimated 6,564 metric tons by 2012. This would have a positive impact toward making the university compliant with Executive Order No. 484. A 10% decrease in electricity purchases combined with a 10% increase in power plant efficiency, as well as the adoption of other energy policy changes, should also advance the university towards compliance with the mandated energy reduction targets.

This plan should be viewed as an ongoing project to be amended as needed. The proposals and policies contained within will also mandate the concerted effort and commitment of the university community as a whole in order to realize its goals. Many of these suggestions may require lifestyle changes within the community that may initially create slight variations from the way things have traditionally been approached and may require time for adaptation. But with the input, cooperation, and support of the students, faculty, and staff this plan can help to create a more sustainable and enjoyable experience for our entire campus community.