

# Climate Action Plan 2021



**Framingham**  
State University

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## Introduction

This 2021 update of Framingham State University's Climate Action Plan report is transmitted on behalf of Dr. F. Javier Cevallos, the President of Framingham State University (FSU).

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 President's Climate Action 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 21<sup>st</sup> century. In 2014, 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 5<sup>th</sup> Assessment Report (AR5) released on March 31<sup>st</sup> 2014. The report is a continuation of the 4<sup>th</sup> Assessment Report (AR4) and has involved over 12,000 scientific references and over 1,700 expert reviewers. Not only does the report recognize that anthropogenic activity is very likely to have contributed to climate change, but it also "considers how impacts and risks related to climate change can be reduced and managed through adaptation and mitigation."<sup>1</sup>

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 such 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.<sup>2</sup>

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.

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<sup>1</sup> IPCC 5th Assessment Report, Working Group II, "Summary for Policymakers," p. 3.  
[www.ipcc-wg2.gov/AR5/images/uploads/IPCC\\_WG2AR5\\_SPM\\_Approved.pdf](http://www.ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf)

<sup>2</sup> IPCC 4<sup>th</sup> Assessment Report, Working Group I, "Summary for Policymakers," Section B  
[www.ipcc.ch/publications\\_and\\_data/ar4/wg2/en/spmssp-b.html](http://www.ipcc.ch/publications_and_data/ar4/wg2/en/spmssp-b.html)

FSU is committed to taking climate action and working towards climate justice 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 futures in a new economy and for their roles as responsible stewards of their communities.

The first Climate Action Plan (CAP) was developed beginning in the summer of 2007 under the leadership of the FSU 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 original report, including the Environmental Subcommittee of the Facilities Strategic Planning Committee, student clubs, and staff groups. Each of these interest groups coordinated efforts and developed action items for our first CAP. Since then, the subsequent CAP reports have discussed implementation and progress towards the original CAP actions.

In adopting and implementing this CAP, FSU 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 the 2021 Climate Action Plan include:**

*Megan Lehnerd: Assistant Professor of Food and Nutrition and Campus Sustainability Coordinator*

*Dale Hamel: Executive Vice President of Administration, Finance, and Technology*

*Patricia Whitney: Assistant Vice President of Facilities and Capital Planning*

*Maureen Bagge Fowler: Director of Environmental Health and Safety*

*Cover by Jonathan Kutzer*

**We want to extend out gratitude to past campus sustainability leaders and contributors to previous Climate Action Plans:**

*Carl Hakansson: Professor of Geography, University Sustainability Coordinator*

*Warren Fairbanks: Associate Vice President of Facilities and Capital Planning (RETIRED)*

*Robert Tatro: Director of Boiler Plant and Utilities*

*Luke Fairbanks: PhD Student, Duke University Marine Laboratory*

*Kaitlyn Kutzer: Framingham State University Intern and Alumni*

**Contact Information:**

**Megan Lehnerd**

Assistant Professor of Food and Nutrition and Campus Sustainability Coordinator

**mlehnerd@framingham.edu**

**Patricia Whitney**

Assistant Vice President of Facilities and Capital Planning

**pwhitney@framingham.edu**

## About this Action Plan

This Climate Action Plan (CAP) describes the climate action and environmental justice actions and policies accomplished and planned for Framingham State University (FSU). The CAP includes a strong emphasis on reducing CO<sub>2</sub> emissions and energy use as well as new policies intended for creating a sustainable, healthy, and just 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 CAP 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 its existing resources.

The achievements and actions described in this CAP 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 the ACUPCC. The publication of this plan is intended to report on FSU's progress towards our action steps and to support accountability moving forward. This 12th edition of the CAP summarizes our historical achievements and outlines current actions. The CAP is intended to be a dynamic document, and it is a goal of the CAP authors to use the AY 2021-2022 to conduct a thorough, community-driven CAP update and to develop a five-year action plan.

As noted, this is the 12<sup>th</sup> edition of this plan. It can also be found at:  
[www.framingham.edu/facilities/sustainability/climate-action-plan-and-updates.html](http://www.framingham.edu/facilities/sustainability/climate-action-plan-and-updates.html)

## Greenhouse Gas Inventory

A greenhouse gas emissions inventory is essential to developing a CAP and tracking progress. The original Inventory established a baseline emissions level and subsequent tracking demonstrates trends in the University's emissions and energy use. Data from fuel consumption, electricity purchased, transportation habits and other categories were collected and analyzed to determine the "carbon footprint" of the University. We have used various emissions calculators since 2004; however, since 2018 FSU uses SIMAP.

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 FSU is commuting to and from the University by faculty, staff, and students. The University includes more than what is required in Scope 3 reporting.

The combined total of these categories represents the total GHG emissions from the 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)

The following pages highlight the emissions of note generated by FSU. Note that in AY 20, we were down by more than 60% of our 2004 baseline. However, closures between March and June 2020 due to the COVID-19 pandemic contributed to the overall reduction.

# FY20 Emissions Inventory

	2020 SIMAP	2019 SIMAP	2018 SIMAP	2019 CES	2009 (PEAK) CACP	2004 (ESTABLISHED BASELINE) CACP	2019 % vs Baseline
<b>Scope 1</b>							
Other On-Campus Stationary	4,334	4,595	4,677	4,399	7,148	7,142	-35.66
Direct Transportation	283	306	319	324	240	141	116.59%
Refrigerants & Chemicals	48	5	16	50	not reported	not reported	
Fertilizer & Animals	2	1	1	2	402.5	402.5	-99.81%
<b>Total Scope 1</b>	<b>4,667</b>	<b>4,907</b>	<b>5,012</b>	<b>4,775</b>	<b>7,791</b>	<b>7,685</b>	<b>-36.15%</b>
<b>Scope 2</b>							
Purchased Electricity	2,647	3,041	2,972	4,393	4,251	4,244	-28.35%
<b>Total Scope 2</b>	<b>2,647</b>	<b>3,041</b>	<b>2,972</b>	<b>4,393</b>	<b>4,251</b>	<b>4,244</b>	<b>-28.35%</b>
<b>Scope 3</b>							
Faculty Commuting	174	236	223	556	1,448	1,127	-2.0%
Staff Commuting	642	826	847				
Student Commuting	1,388	2,006	1,954	2,055	17,102	14,163	-85.8%
Other Directly Financed Travel	56	86	75	7	109	58	1,493.8%
Study Abroad Air Travel	369	760	751	187			
Solid Waste	0	0	0	-81	-10.8	-12.5	-100.0%
T&D Losses	135	155	155	264	420	420	-63.1%
<b>Total Scope 3</b>	<b>2,764</b>	<b>4,069</b>	<b>4,006</b>	<b>2,988</b>	<b>19,069</b>	<b>15,755</b>	<b>-74.2%</b>
<b>Total Emissions</b>							
<b>Total</b>	<b>10,078</b>	12,017	11,990	12,156	31,110	27,684	
Less Composting (if separate)	-22	-46	-21				
Net Total MTCDe	10,056	11,971	11,969	12,156	31,110	27,684	-56.8%
CO2 MTCED (reduction) or Increase from Baseline	(17,628)	(15,713)	(15,715)	(15,528)	3,426		
% change from Baseline	-64%	-56.8%	-56.8%	-56.1%	12.4%		

## Notes:

Renewable Power

**%17.0**

Sightlines emissions data was provided in graph (vs tabular) format for FY13-16, so unable to include comparison data

## Considerations:

- (a) Different calculators/preparers can make a difference (commuting, t&d losses)
- (b) Methodologies evolve over time (i.e. electricity, biogenic carbon, waste/recycling, head count due to online)
- (c) Looking for consistency for year over year comparison

## FY20 Emissions Breakdown

	C02 (kg)	C02 (MTCDE)	CH4 (kg)	CH4 (MTCDE)	N20 (kg)	N20 (MTCDE)	GHG MTCDE
<b>Scope 1</b>							
Other On-Campus Stationary	4,320,020	4,320	432	12	9	2	4,334
Direct Transportation	280,451	280	15	0	10	3	283
Refrigerants & Chemicals	0	0	0	0	0	0	48
Fertilizer & Animals	0	0	0	0	8	2	2
<b>Total Scope 1</b>	<b>4,600,471</b>	<b>4,600</b>	<b>447</b>	<b>13</b>	<b>27</b>	<b>7</b>	<b>4,668</b>

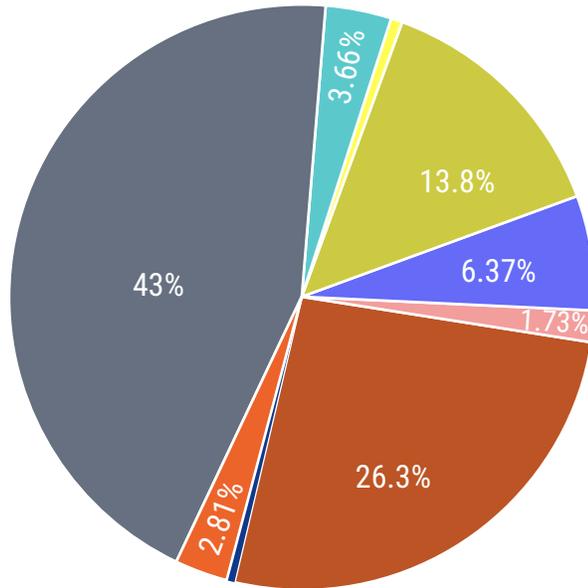
<b>Scope 2</b>							
Purchased Electricity	2,620,710	2,621	411	12	55	15	2,647
<b>Total Scope 2</b>	<b>2,620,710</b>	<b>2,621</b>	<b>411</b>	<b>12</b>	<b>55</b>	<b>15</b>	<b>2,647</b>

<b>Scope 3</b>							
Faculty Commuting	172,159	172	9	0	6	2	174
Faculty Commuting	635,336	635	34	1	21	6	642
Student Commuting	1,374,119	1,374	73	2	46	12	1,388
Other Directly Financed Travel	46,973	47	62	2	28	7	56
Study Abroad Air Travel	367,529	368	4	0	4	1	368
Solid Waste	0	0	0	0	0	0	0
T&D Losses	133,606	134	21	1	3	1	135
<b>Total Scope 3</b>	<b>2,729,722</b>	<b>2,730</b>	<b>203</b>	<b>6</b>	<b>108</b>	<b>29</b>	<b>2,764</b>

	C02 (kg)	C04 (MTCDE)	CH4 (kg)	CH4 (MTCDE)	N20 (kg)	N20 (MTCDE)	Net MTCDE
<b>Total Emissions</b>							
<b>Total</b>	<b>9,950,903</b>	9,951	1,061	30	190	50	10,079
<b>Less Composting</b>							-22
<b>Net Total MTCDE</b>	<b>9,950,903</b>	9,951	1,061	30	190	50	10,056

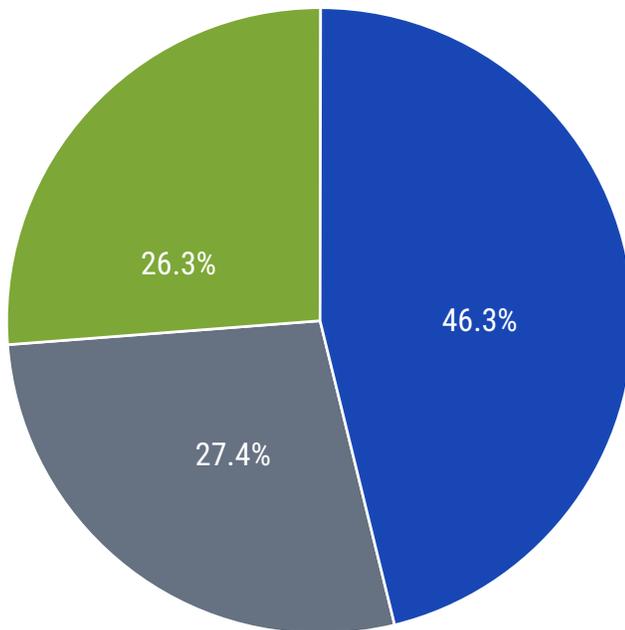
# Pie Chart Emissions FY20

**CARBON: 2020**



- Co-gen Electricity
- Co-gen Steam
- Other On-Campus Stationary
- Direct Transportation
- Refrigerants & Chemicals
- Fertilizer & Animals
- Purchased Electricity
- Purchased Steam/Chilled Water
- Faculty Commuting
- Staff Commuting
- Student Commuting
- Directly Financed Air Travel
- Other Directly Financed Travel
- Study Abroad Air Travel
- Student Travel to/from Home
- Solid Waste
- Wastewater
- Paper Purchasing
- T&D Losses
- Food

**CARBON: 2020**



- Scope 1
- Scope 2
- Scope 3

## 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 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 2050

Of the goals listed above, FSU met the 2012 and 2020 goals. 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 in MTCE. Therefore, to comply with these standards, FSU must enact a comprehensive and holistic initiative addressing many aspects of the University community.

The original FSU CAP was composed of 15 major action points. Each point included a discussion on: identification of the issue, proposed solutions, and anticipated benefits. Progress towards these original actions has been measured from a quantitative and qualitative perspective, depending on the proposed action. This 12th edition of the report describes past achievements related to these actions and future directions.

The 15 major action points are divided into three basic energy and GHG reduction categories: general campus policies; upgrades and projects; and lifestyle changes for students, faculty, and administration. Implementation of the action items of the CAP is a joint responsibility of the Campus Sustainability Coordinator, the Facilities Department, and the University President. However, the cooperation and support of the entire University community is essential. A student organization, The Green Initiative, helps to coordinate student involvement and to help facilitate new policies involving student lifestyle changes campus-wide.

## Highlights

This CAP outlines the creation and effective coordination of policies and interventions that will reduce the campus carbon footprint, enhance and support climate justice and environmental sustainability endeavors, and produce educational opportunities that will enrich and expand the backgrounds of the students.

The Plan is divided into three sections:

- Because of the exigency in reducing greenhouse gases, Action 1-6 deal primarily with both structural investment and policy matters that have a direct correlation to reducing both CO<sub>2</sub> emissions and energy demands.
- 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 enhance the sustainable programs of the University.
- Actions 14 and 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

### **Achievements from April 2009 to April 2021:**

The ISSUE was that the power plant boilers, which produced the steam used for heating and cooling 95% of the campus, while dependable, were 48 years old, antiquated, and burned #6 heating oil. The burning of #6 heating oil is very high in GHG emissions. The plant was emitting approximately 7,000 metric tons of CO<sub>2</sub> per year. This was the second leading contributor to the campus carbon footprint.

The SOLUTION arrived at was 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 have been preferable in a long range plan, conversion from #6 oil to natural gas was currently the most feasible immediate solution.

A 2.7 million dollar grant was secured to retrofit the power plant boilers from #6 oil to natural gas thereby reducing carbon emissions by 25%. This project was a part of a larger 6 million dollar Energy Performance Contract program. Finished in 2013, the power plant was converted from #6 oil to natural gas and the underground oil tanks were removed.

Ultimately, the BENEFITS of converting the power plant to natural gas was that it potentially created a direct, measurable and significant effect on the campus carbon footprint, possibly reducing GHG emissions by 2,061 metric tons annually accounting for an estimated 30% reduction in the second largest contributing category.

### **Goal for AY 2021 - 2022:**

Continued maintenance of the natural gas power plant and to explore additional energy savings projects.

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

### Achievements from April 2009 to April 2021:

The ISSUE is that a significant amount of the 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 CO<sub>2</sub>e.

The SOLUTION is an on-going effort to convert our electricity portfolio to allow for a portion of our purchased power to be produced from renewable sources and to reduce our electricity usage. We have made progress towards these two objectives, and there is still room left to improve.

With regards to renewable energy, 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.

Towards the aim of reducing energy consumption, a variety of actions have been successfully completed.

- ✓ Better lighting controls and motion sensors have been put in place to reduce lighting in hallways and exterior of buildings when they are unoccupied.
- ✓ Campus-wide computer power management protocols have been implemented.
- ✓ Previous educational efforts have focused on personal responsibility for turning off office, dorm, and classroom lights when leaving.
- ✓ Photocopying has been centralized to reduce individual office printers, and defaults have been set to print double-sided.
- ✓ A policy is in place to systematically replace all motors on campus as renovations or turn-over occurs so that new motors are ultra-high efficiency.
- ✓ The Dining Commons went trayless, which resulted in a reduction in the energy and water used in dish washing.

Although lifestyles 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 AY 2021 - 2022:

To continue to explore feasible and sustainable sources of renewable energy for the campus, including energy purchased from our electricity provider and additional options to generate renewable energy on campus. We intend to prioritize the generation of green energy and will consider the purchase of Renewable Energy Credits (RECs) as an additional option.

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

### Achievements from April 2009 to April 2021:

The ISSUE is that 70% of the University staff, faculty, and students commute to the campus. This provides an estimated 15,991 metric tons of CO<sub>2</sub> emissions as well as traffic congestion and parking issues that not only affect the campus and surrounding community environments, but also the quality of life on campus. FSU also advocates for experiential learning experiences and for students to become global stewards through study abroad experiences.

The SOLUTION to this problem is complex and requires the coordination of policy changes in several aspects of campus planning. Transportation will continue to be a challenge for FSU due to the high percentage of staff, faculty, and students who will commute into the future. Actions may be feasible to reduce the environmental impact of study abroad travel and/or to purchase carbon offsets when travel occurs.

The goal of this action is to reduce campus related traffic by 20%. The BENEFITS of addressing an effective and coordinated approach to these and other policy changes would include: reducing an estimated 3,468 metric tons of CO<sub>2</sub> emissions, which is a significant reduction in our largest GHG source; reducing traffic congestion on campus and providing for a healthier quality of life campus-wide. Numerous successful policy changes and actions have been implemented to increase transportation efficiency and reduce emissions.

- ✓ A carpool decal was created and a lot was established for AY 2010.
- ✓ Four new electric car charging stations were added in Fall 2018 and were operational in Fall 2019. Two stations are located in the Salem End lot and two in the Maple lot.
- ✓ The shuttle kiosk was moved from the center of the campus and was replaced by 2 bicycle racks.
- ✓ 6:30 time blocks were created to allow day students more flexibility in choosing their classes potentially leading to less commuting days.
- ✓ MWRTA has amended their bus routes to allow for direct service for students from downtown Framingham and other MetroWest destinations.
- ✓ Two Zip Cars have been added to assist in more effected auto congestion on campus.
- ✓ A new "Ram Tram" service encourages use of shared transportation to local destinations including the Natick commuter rail station.
- ✓ FSU hired a transportation coordinator to increase efficiency of shuttle and commuter issue.
- ✓ RAM TRAM tracker was initiated allowing students to track school shuttles for availability on their phones.
- ✓ A partnership with a local taxi service has created a voucher program for students offering an inexpensive alternative to having more cars on campus.

- ✓ NuRide is a new program offered through MassRIDES (a division of Mass. DOT). This program allows students to earn redeemable reward points by taking public transportation, carpooling, biking, walking, or working from home.

Through a series of events including: a significant increase in hybrid and on-line courses, more flexible scheduling, more accurate record keeping, and a more efficient way of calculating miles spent commuting, we have reduced our CO2 emissions from 15,991 metric tons in 2004 to 4,006 metric tons in AY 2020. This is a reduction of 74.6%.

**Goal for AY 2021 - 2022:**

To explore additional policies and interventions that could further reduce emissions. These policies and interventions might including converting the campus fleet to electric vehicles and/or to more efficient vehicles (where feasible with turn-over), implementing a no-idling policy for all University and guest vehicles, and exploring ways to reduce emissions/support offsets for study abroad travel. Additional class scheduling and commuting solutions will be considered.

## Action #4: Increase Building Energy Efficiency

**Achievements from April 2009 to April 2021:**

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

The SOLUTION has been to improve on-campus 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. The BENEFITS of adherence to the implemented and suggested 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.

An energy investment grad audit of the entire campus was completed, including doors, windows, and other portols. The audit outlined an array of energy saving measures that could address the identified inefficiencies. While \$100,000 was designated for energy reduction projects, additional costs to implement energy efficiency measures will be offset by increased savings in energy costs.

A number of infrastructure changes have been implemented to enhance energy efficiency.

- ✓ The steam chiller was replaced in the McCarthy Center with modular high-efficiency chillers.
- ✓ A new central chiller (to replace the Hemenway Hall Chiller) was installed.
- ✓ The air-conditioning pumps in the McCarthy Center and the heating pumps in Larned Hall have been replaced by more energy efficient pumps.
- ✓ Under our Energy Performance Contract: All lighting was replaced in the Library. The Library chiller was replaced. The Linsley Hall boiler was replaced. Improvements were made to the May Hall steam heating. Weather stripping and insulation were added to the doors campus-wide. Air-conditioning upgrades and replacements were made in Dwight Hall. All lighting was replaced in Larned Hall. Energy efficient entry ways were constructed on Hemenway Hall.

- ✓ All windows were replaced in Hemenway Hall and Annex.
- ✓ Low flow toilets were installed in Miles Bibb Hall.

FSU currently employs policies that are energy conscious.

- ✓ All use of incandescent light bulbs has been eliminated and replaced with fluorescent lighting. Currently, LED lights are now in rotation to replace fluorescent lighting with turn-over.
- ✓ An energy management system has been put into place in an attempt to control the temperature extremes in those buildings with both heating and cooling systems.
- ✓ Signage is in place encouraging lights to be turned off in rooms that are not in use. A directive was issued to maintenance workers to only have lights on in the classrooms where they are actually working. With effective implementation it can promote significant decreases in energy demand at no cost added to the University.
- ✓ All new building structures should be Leadership in Energy and Environmental Design (LEED) certified. Both Miles Bibb Hall and West Hall were designated as LEED Gold certified when constructed. The Hemenway Science Labs Addition was certified LEED Silver and includes 49 Green Solution Hoods featuring Erlab's GreenFumeHood filtration technology. While these three LEED certified buildings provided energy reduction credits, they were only good for three years post-construction.

**Goal for AY 2021 - 2022:**

To explore additional ways to implement the remaining phases of the energy audit. Additional strategies may include:

- ✓ Increase use of LED lights
- ✓ Behavior change campaigns to reduce student, staff, and faculty energy use. In November 2009, a campus-wide student energy and water conservation contest was conducted between the residence halls. It resulted 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. Annual initiatives like this could be useful to engage students in behavior changes that will ultimately result in savings to the University.
- ✓ A review the use of University facilities in general, particularly those events that are non-university related. While a reduction in these types of events may result in economic and energy use savings, it's also important to recognize that FSU is an important resource for the MetroWest community and use reductions could have negative consequences on our community relationships.

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

**Achievements from April 2009 to April 2021:**

The ISSUE is that, by nature, a large dining facility produces large amounts of waste and consumes large amounts of energy. The on-going SOLUTION is to implement as many policies and interventions as possible that will reduce energy waste and physical waste while simultaneously attempting to reuse anything

possible. 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.

FSU Dining Services have already implemented numerous policies and practices that are environmentally responsible including several related to the infrastructure in the Dining Commons:

- ✓ A commitment to replace aging appliances with Energy Star certified appliances.
- ✓ Reducing the delivery frequency of vendors to save on transportation emissions.
- ✓ A transition to use Green Seal Certified chemicals in the Dining Commons and a new Apex ware washing program, which allows for savings of 30,113 gallons of water and 16,863 kWh of electricity over the previous program.
- ✓ Dining services went tray-less as of January 2010. Eliminating this practice saves approximately 200,000 gallons of water per year and saves the University approximately \$3,500.

Specific food procurement and food waste reduction efforts have also been implemented, including:

- ✓ Policies to buy local products when possible and to monitor food origins in an effort to eliminate the support of factory farms which produce significant amounts of GHG's and threaten water supplies.
- ✓ Recycling kitchen oil, which is currently converted to bio-fuel.
- ✓ Useable excess food items have been repurposed through Dining Services and student-led efforts. Over 1,000 lbs. of food has been donated to the MetroWest Harvest Food Bank, and the Food Recovery Network club has recovered 2,543 lbs. of food to date.

Dining Services has worked to procure more sustainable materials for use in the Dining Hall and to reduce overall material waste through measures that include:

- ✓ All Green Mountain paper cups are now EcoTainers.
- ✓ Napkin baskets have been converted to Xpressnap napkin dispensers.
- ✓ Discounts are offered to incentivize travel mug use.
- ✓ Dining services moved to completely compostable plates and utensils in 2012 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. LeanPath is used to track food waste in the Dining Commons. We composted 76 tons of food waste in FY2020.

**Goal for AY 2021 - 2022:**

To continue to educate, plan, and implement policies that encourage recycling, waste reduction and

policies that support local sustainable food sources. Further exploration is needed to enhance efforts in the Dining Commons, and additional support is required to continue the student-led Food Recovery Network efforts on an annual basis.

## Action #6: Increase the Use of Alternative Energy Sources

### **Achievements from April 2009 to April 2021:**

The ISSUE is that there are limited on-campus uses of renewable energy sources. Energy independence through the use of cleaner and more modern renewable sources is necessary to reduce the use of fossil fuels and may be a cornerstone of future economic development both statewide and at the national level.

The SOLUTION is to continue to increase the ratio of renewable energy sources for our purchased electricity and to actively pursue the feasibility of more renewable energy sources on campus. After an assessment by Energy Efficiency and Sustainable Building Group of the Department of Capital Asset Management, Solar Photovoltaic systems were added to the Athletic Center and the McCarthy Center. These systems generate approximately 74,000 kWhs) of electricity. It is worth noting that we do not own the REC's for the solar arrays on our roofs. They are owned by DCAMM and for a couple years, they agreed to buy replacement REC's. As of 2019, they no longer will.

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 AY 2021 - 2022:**

To pursue plans and funding to sustain our current photovoltaic installations and for further photovoltaic installations as well as other sources of renewable energy. It's important to note that these installations required on-going maintenance and their energy storage capacity declines over the life of the product. It's essential that we incorporate long-term plans for maintenance and funding into the action steps we take regarding alternative energy sources.

## Action #7: Increase the University Recycling Ratio

The ISSUE is that the University's recycling percentage in 2009 was 20%. The SOLUTION has been 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%. Additionally, work has been done to reduce the use of single-use products that may end up in the recycling stream, like single-use water bottles for example.

Framingham State University initiated single stream recycling in September 2009, reducing the confusion of the recycling process. The number and size of recycling containers has increased with plans

for signage and lids to encourage and understanding of what is recyclable. Fifty-one new receptacles with separate trash and recycling compartments were purchased and placed throughout the campus.

Toner cartridges, furniture, computers, fluorescent bulbs, telephones, and batteries are also recycled. A truck load of fluorescent bulbs, computer equipment, and batteries were recycled in Fall 2010. About 60 cubic yards of metal products are recycled per semester. The University has also implemented a policy of ordering only recycled paper for photocopying and printing.

In order to reduce single-use plastics on campus, water bottle filling stations have been installed in various high-traffic areas on campus. Prior to 2019, a total of six stations were located around campus, including the McCarthy Center, the Athletic Facility, Dwight Hall, West Hall, and Miles Bibb Hall. In 2019, additional stations were added in Horace Mann, Peirce Hall, Larned and Crocker Hall as a part of facilities upgrade projects. In partnership with the Student Government Association, eight more stations were funded and installed in Hemenway Annex, Hemenway Labs, the library, May Hall, and O'Connor Hall. In 2021, there are plans to install more filling stations in Linsley Hall and in the Athletic Facility.

The BENEFITS of a more efficient recycling program are numerous. Recycling reduces demand for new raw materials 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 GHG's and provides for a cleaner environment overall. Including the recycled compost from dining services, the percentage of recycling for the University is 30%.

**Goal for AY 2021 - 2022:**

To explore additional ways to efficiently and effectively increase our recycling percentage and/or reduce the amount of single-use products on campus that end up in the recycling and/or waste stream. Additional strategies may include:

- ✓ The installation of additional water bottle filling stations in high traffic areas on campus.
- ✓ Educational campaigns for FSU students, staff, and faculty to reduce, reuse, and recycle on and off campus.
- ✓ Collaborations with FSU Dining Services to minimize single-use plastics.

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

**Achievements from April 2009 to April 2021:**

The ISSUE is that global deforestation has contributed significantly to climate change and to the release of GHG's. Clear-cutting of forests has led to loss of wildlife habitat, soil erosion, water pollution, and elevated CO<sub>2</sub> 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 which ultimately contributes to the evolution of resistant pests. Additionally, industrial timber forests often may not provide the same ecosystem services as natural stands. Beyond the source materials for the paper used in printing, the chemicals used in printing generate waste that if not properly disposed of is harmful to the environment.

The SOLUTION is to reject products that contribute to this environmental degradation. Information Technology Services (ITS) conducted a printing assessment for the University community. This assessment took into account types of printers on campus, energy use, paper use, toner use, and associated costs. Suggestions were made to decrease the 5,800,000 pieces of paper (\$34,000) used campus-wide, as well as reduction on energy consumption and toner usage (\$70,500).

As a result, FSU has committed to a policy of ordering recycled paper for purposes of photocopying and printing. Students, faculty and staff have been asked to print less, use online assignments when possible, convert business and student record functions to paperless electronic formats, and actively participate in recycling their own paper waste. The Admissions office has converted to an electric application process substantially reducing paper use. The combination of two sided printing, voluntary conservation, and network printing has reduced paper use significantly campus-wide.

In order to reduce the waste coming from on-campus printing, the University purchased a new platemaker which uses no chemicals. The old platemaker, using old technology, had a 5 n tank containing the chemical wastes from the print process which needed to be disposed of each month. This purchase eliminates those chemical wastes.

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. Chemical waste reduction has also been achieved.

**Goal for AY 2021 - 2022:**

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

## **Action #9: Decrease Campus Water Use**

**Achievements from April 2009 to April 2021:**

The ISSUE is 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, regional, and worldwide 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, 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. All storm water runoff from Miles Bibb Hall is captured and recycled for irrigation.

The operation of dining services consumes a large volume of water. Going tray-less in the dining areas created significant water savings, an estimated 500 gallons of water daily. This equates to an annual savings of 200,000 gallons of water and \$3,300 for the University. The dining facilities were completely renovated to accommodate composting, contributing to a decrease in water use of 1.8 million gallons in 2010. By going fully compostable, millions of gallons are saved through the elimination of the garbage disposal. In 2019, 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). Additionally, an estimated 8.4 million gallons of water were saved by refrigeration conversion in the dining hall, creating a savings of \$148,400.

Other 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, conservation efforts (i.e. shorter shower, replacing leaky faucets, etc.) have been encouraged. In November 2012, all residence hall washers and dryers were replaced with new equipment, saving 1.9 gallons of water per cycle. Also, stickers were installed over the washing machine operation buttons which visually identify cold/cold cycles. The laundry vendor for the University, MacGray, ran the savings against current usage data and found that on average we have saved approximately 3,283 gallons of water per month. Over a full academic year, the savings were projected to be 26,264 gallons.

A comprehensive review of campus water use has been completed to assist in addressing further water use issues and associated costs. All new construction will consider incorporating rainwater collection, reuse of gray water, and low flow fixtures.

The BENEFITS of a sustainable potable water supply use policy 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 AY 2021 - 2022:**

To continue 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.

## **Action #10: Make More Efficient Use of Flexible Scheduling**

**Achievements from April 2009 to April 2021:**

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 is to approach the class schedule from a holistic perspective allowing for more efficient use of under used 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 the classroom space, allow for online student advising hours, and reduce campus congestion at certain peak times of the day. The feasibility of these models should be given serious consideration.

To date, the 4:30 and 6:30 time blocks have been fully matriculated in the day school schedule allowing students and faculty more flexibility and the opportunity to reduce commuting days. A governance proposal has been approved that accommodates hybrid (mix of in-class and on-line) courses beginning AY2011. Transportation emissions in AY 2020 were lower than previous years, which is likely due in large part to reduced commuting and remote learning from March - June 2020 due to the COVID-19 pandemic.

The BENEFITS to creative and flexible scheduling may lead to many students and faculty being able to reduce one day of commuting from their schedules. This could help to ease campus congestion, contribute significantly to reducing the campus carbon footprint, and attaining the goal set out in Action #3.

**Goal for AY 2021 - 2022:**

To continue to develop and encourage methods for flexible scheduling, offering the students and faculty an opportunity to decrease their commuting days. Collaboration with HR is needed to consider the implications of this goal for staff.

## Action #11: Increase Campus Computer Efficiency

**Achievements from April 2009 to April 2021:**

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. 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 has decreased from 60 to 46 (just below 25% of the systems infrastructure) saving an average \$5,200 annually.

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 recycled. Recommendations have been adopted to inform, educate, and provide the capability for faculty, staff, and students to eliminate the use of paper for 90% of daily printing. The University provides campus-wide information on methods to convert to a paperless campus including seminars, web-based communication, posters, classroom discussion, etc. IT provides the necessary software on how to use each campus work station in order to print, mark-up, sign, etc. electronically.

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 AY 2021 - 2022:**

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

## Action #12: Make Campus Ground Keeping More Eco-Friendly

### **Achievements from April 2009 to April 2021:**

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, potable water, and synthetic fertilizers. Grounds keeping 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 has been 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 students, faculty and staff campus-wide. Additionally, the University purchased the Warren Conference Center in Ashland. The Center includes 75 acres of mostly open space and is adjacent to Ashland State Park and the Warren Woods conservation land.

Currently the grounds keepers employ several environmentally responsible practices such as hand weeding and support of native plant species on campus. The University previously hired a landscape consultant to assist in converting grass ground cover to alternatives that are more environmentally friendly. A GIS inventory of the campus trees has been created, and natural vegetation areas are included surrounding new building construction.

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 and odorous. 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 2008. Leaf blower complaints have been a growing concern for years. Leaf blowers are loud, they produce noxious exhaust, and create a potential health hazard. Studies have shown that the practice of blowing wet leaves can propel certain fungal spores in to the air which is a health risk for humans and wildlife alike. Green Team (former student club) 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 received some 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 a perceived nuisance. Also, the more 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 AY 2021 - 2022:**

To continue to replace areas of grass cover with alternative environmentally friendly ground cover

reducing fuel use, noise and air pollution, while promoting eco-friendly habitat. Collaborations will be necessary between facilities, faculty staff, and students to manage campus resources like the community garden, pollinator garden, and other sustainable landscaping initiatives.

## **Action #13: Establish Environmentally Conscious Purchasing Policies**

The ISSUE was that, although there had been a commitment by the University to adopt more responsible environmental policies and practices, there was no official mandate that governed a purchasing policy campus-wide with regard to environmental responsibility. The University required all appliances purchased on campus and all appliances used by students in their residence halls to be Energy Star certified, however a more wide-reaching policy was needed.

The SOLUTION was to adopt a campus policy in 2008, which mandated 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. A buy local directive also was initiated. One significant change that resulted is that the University purchases green graduation gowns.

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 AY 2021 - 2022:**

To re-enforce and consider updating the sustainable purchasing policy to consider sustainable alternatives in major campus purchases.

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

The ISSUE was that there was not a uniform forum that allowed 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 involved the appointment of a sustainable policies coordinator position and the creation of a forum that could co-coordinate the entire Climate Action Plan. This forum had the opportunity to evaluate adherence to new policies, create an effective dialogue that interconnects facilities, administration, faculty and students, and develop an educational network that provided the campus community with information regarding present campus policies as well as considerations for future policy issues.

This informational forum consisted of students, faculty, staff, and administration in an open campus discussion and was actively meeting until approximately three years ago. The BENEFIT of this forum was to centralize all campus discussion of environmental policy issues from practical, theoretical, and pedagogical perspectives.

There is a need to re-create this forum and engage a broad group of FSU community members. It's particularly important that voices typically underrepresented in environmental and climate justice efforts are present and that climate justice is central to the Forum discussions.

In addition to the forum, a student Green Team has been active off and on over the past ten years. Interest had recently waned, but a reconstituted Green Initiatives group formed in AY 2020 with the aim of reviving the campus community garden and engaging in other student-focused initiatives.

**Goal for AY 2021 - 2022:**

To reestablish the Environmental Campus Forum to engage a broad group of FSU community members around sustainability practices and curriculum developments that prioritize issues of climate justice.

## **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**

**Achievements from April 2009 to April 2021:**

The ISSUE is that there are many approaches to addressing climate change and climate justice which are often viewed as unrelated. The SOLUTION is to provide access for each department to become involved in the discussion, contributions, and applications of this plan. Readings, projects and other assignments regarding the relevance of the discipline to sustainability should be made available as 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.

Towards this goal, the University created an interdisciplinary Environmental Science major in 2009 which incorporates aspects of eight disciplines in a holistic approach to environmental stewardship. A new major Environmental Policy and Sustainability was adopted within the Geography Department. Over time, the Biology, Earth Science and Physics, Geography, Food and Nutrition, Chemistry and Food Science departments have created several new courses with an emphasis on climate change and sustainability including: Making Places Sustainable, Climatology and The Future of Human Society, Limnology, Principles of Ecology, Sustainable Food Systems, Principles of Food Science, Introduction to Food Science and Technology, Introduction to Environmental Studies, and Resource Management.

**Goal for AY 2020 - 2021:**

To expand and promote the Environmental awareness across disciplines, specifically through discussions in the Environmental Forum. To support the development of a Sustainable Food Systems minor and a Sustainable Fashion minor.

## Conclusion

Framingham State University has made a commitment to address global climate change. Executive Order No. 484 and the University President'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 goals include 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.

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 will 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.





Framingham State University • 100 State Street • Framingham, MA 01701-9101 • [www.framingham.edu](http://www.framingham.edu)