

HAMILTON CLIMATE ACTION PLAN



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DRAFT

Sustainability and long-range plan for climate neutrality at
Hamilton College

Hamilton Climate Action Plan

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INTRODUCTION

Hamilton College prepares young people to be active contributors to the modern world. To that end the College educates students to consider the impact of their decisions on the earth's climate and resources. Hamilton's residential environment promotes learning through all aspects of students' lives. The classroom for sustainability includes traditional classes and laboratories, campus-wide programs and actions, and efforts in the surrounding central New York community.

Hamilton College has been a leader in sustainable concerns for many years. Founded as the Hamilton-Oneida Academy in 1793 and formally chartered in 1812, the College is the third oldest institution of higher learning in New York State. Hamilton has been committed to environmental stewardship on its beautiful and historic hilltop campus for over 200 years. In 2007, under the leadership of President Joan Hinde Stewart, Hamilton joined the American College and University Presidents' Climate Commitment (ACUPCC). The Hamilton College Sustainability Committee, also known as the "Green Team," was formed at that time and charged with forwarding more aggressively the College's sustainability efforts.

This Climate Action Plan is a collaborative effort that includes faculty, staff, trustees and current and former students. A Hamilton alumni group, Graduates for a Greener Hamilton (GGH), was an instrumental voice in the College's decision to sign the commitment and has representation on the Green Team. Current students have played a vital role by participating on Green Team subcommittees and writing portions of the Green House Gas Emissions Summary Report for the ACUPCC. In the coming years, current and former students will be instrumental in furthering the commitment, its various tangible actions, and the goal of carbon neutrality.

Hamilton College is committed to being a **role model for positive climate action** by becoming climate neutral over time. Environmental education and stewardship will continue to be a priority. Students, faculty and staff at Hamilton College will work to protect and sustain a healthy environment through institutional processes, management of facilities and educational activities.

GREEN TEAM GOALS

The committee is charged with recommending programs and actions that achieve tangible progress toward community education and climate neutrality. This commitment extends from greenhouse gas reduction to preventing pollution of natural resources. To fulfill its commitment, the Green Team established these goals:

- Reduce Hamilton College's carbon emission 40% by the year 2025. Hamilton College will reduce its energy consumption and pursue the development and use of renewable energy sources. The goal is to achieve climate neutrality by 2050.
- Develop programs to raise awareness and encourage conservation by all members of the community. Provide tools and incentives for conservation efforts.
- Continue to use Leadership in Energy and Environmental Design (LEED) guidelines for design in new construction and major renovations.
- Use space efficiently to minimize the size of the physical plant and its consequent energy consumption
- Ensure that the College's academic and non-academic practices and processes minimize the use of hazardous materials and the production of hazardous waste.
- Continuously improve Hamilton's recycling program.
- Encourage and support the procurement of local products, to encourage the development of local resources and reduce transportation emissions.
- Focus procurement on products that contribute to sustainability, including those products that are energy efficient, made with recycled content, and have the capacity to be recycled when their use has ended.
- Manage the Hamilton College Arboretum, forest and other landholdings to maximize their potential to store carbon, while ensuring their health, sustainability and contribution to the educational mission.
- Support and encourage curricular programming for environmental education.

CAMPUS EMISSIONS

Hamilton completed its first carbon inventory in 2007. Overall, in 2007, Hamilton's baseline carbon inventory was 24,035 metric tons of carbon dioxide emissions per year. By 2008, as a result of ongoing sustainability efforts, Hamilton reduced its carbon output approximately 6 percent to 22,598 metric tons.

Based on the fiscal year 2008 carbon inventory, 72 percent of Hamilton's greenhouse gas production is attributed to its facilities and their electrical and heating fuel use, 13 percent is attributed to air travel, 7 percent is employee commuting, and the remainder is the result of college vehicles, solid waste, fertilizers and refrigerants.

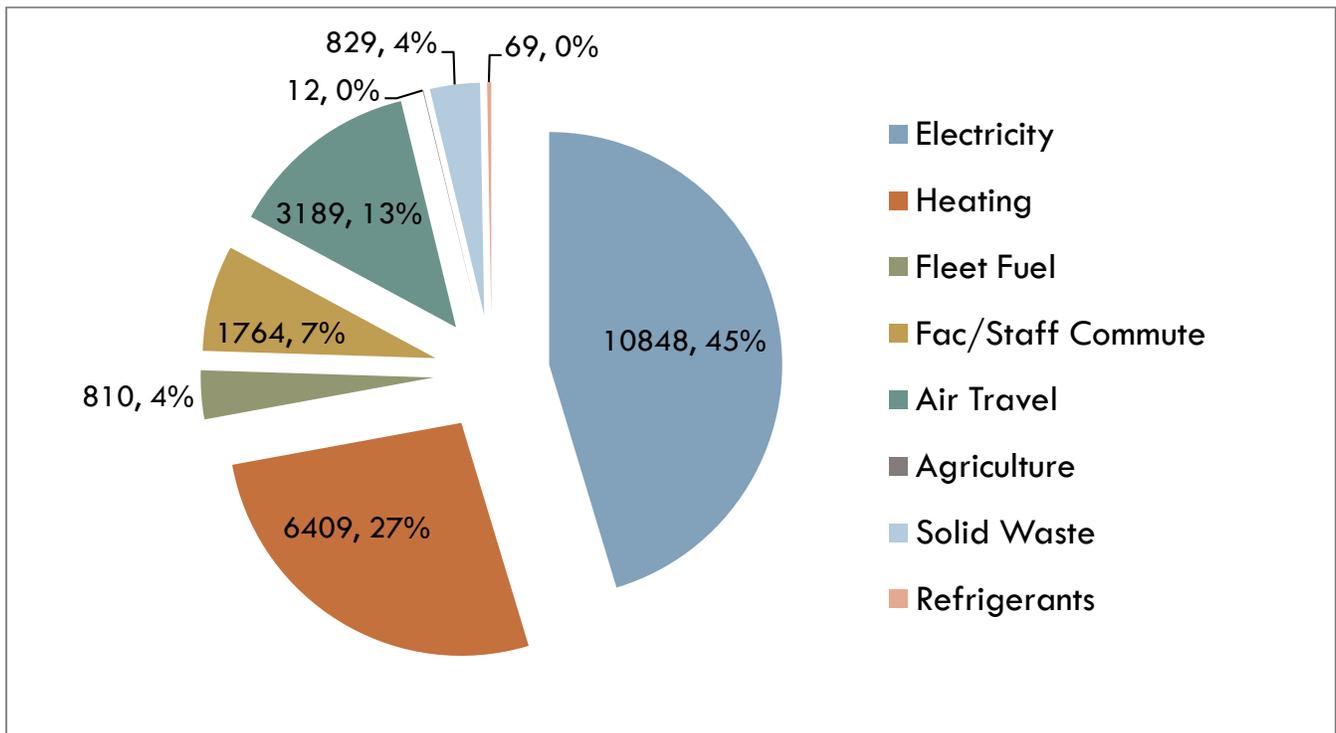


FIGURE 1: DISTRIBUTION OF CARBON EMISSIONS AT HAMILTON

To make significant strides in reducing its emissions, Hamilton must work across a broad front: improving the energy efficiency of its facilities, creating strong conservation programs, and developing opportunities to employ emerging technologies. While energy reduction is paramount, efforts must also ensure that Hamilton continues to be a good steward of the environment in managing and sustaining environmental programs currently in place.

ZERO EMISSION GOAL

The long term goal for Hamilton College is to be carbon neutral. This will require time, resources, and the development of new technologies. Interim goals, measured from the baseline year of 2007, have been established to help the College move toward climate neutrality.

- FY2015: 20 percent reduction (19,228 MTCO₂e)
- FY2025: 40 percent reduction (14,421 MTCO₂e)
- FY2035: 60 percent reduction (9,614 MTCO₂e)
- FY2045: 80 percent reduction (4,807 MTCO₂e)
- FY2050: Carbon Neutral

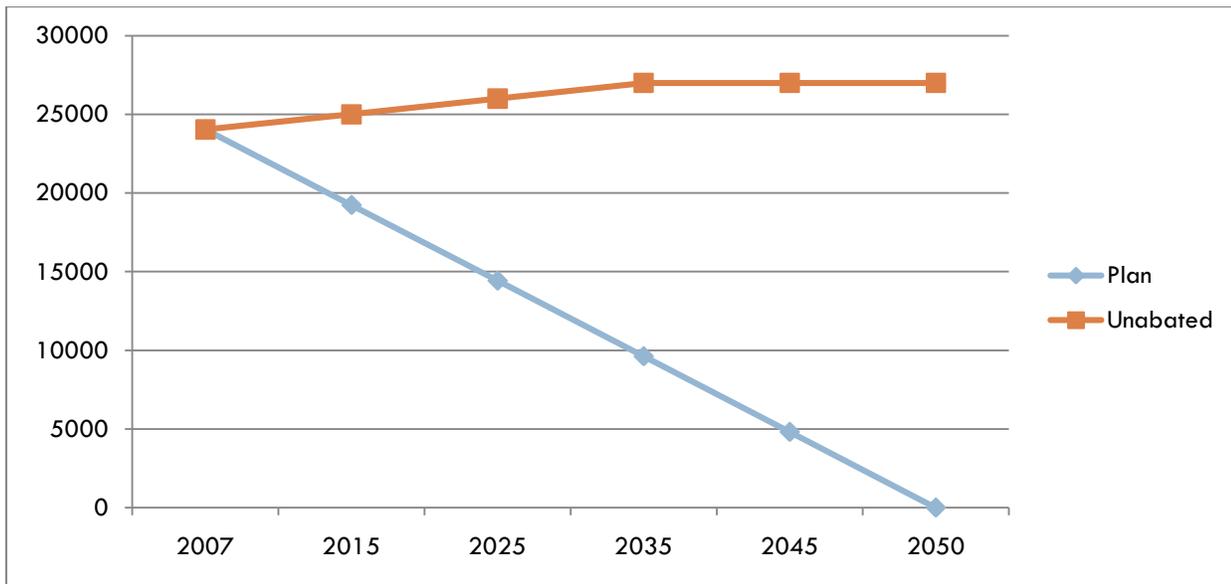


FIGURE 2: PROJECTED CARBON EMISSION LEVEL FOR HAMILTON WITH AND WITHOUT CLIMATE ACTION PLAN

The actions needed to achieve the reductions planned through 2025 are outlined in this report. Plans beyond that timeframe will be developed as technology evolves. The primary strategies employed to make reductions are two-fold: affirmation and implementation of policies that encourage conservation and result in energy efficiency, and physical improvement of buildings and equipment that result in less energy being consumed.

The focus of this plan is to concentrate resources directly on reducing the College's carbon footprint by implementing tangible actions on campus. Hamilton College expects to maintain its purchase of renewable energy credits and carbon offsets at the current level. By 2015 these green energy purchases will total 6.2 million kilowatt hours, the equivalent of 3,066 metric tons of carbon emissions. The purchase of carbon offsets will be reviewed at each project milestone date.

GREEN POLICIES

Implementing green actions has been a customary practice at Hamilton. Recycling programs were implemented in 1991, the Science Center employed efficient geothermal heating and cooling, Skenandoa House was the first historic building in New York State to achieve LEED¹ Silver Certification, and wind and solar energy sources have been implemented for Kirner-Johnson and the Outdoor Leadership Center. A campus landscape master plan, implemented in 2002, mandates a “pedestrian campus” to reduce vehicular traffic, minimize expansion of parking lots and reduce unnecessary fuel consumption.

Hamilton purchased its first renewable energy in July 2004 for the newly renovated Skenandoa House. Since that time, Hamilton has expanded its purchase of renewable energy credits to 6.2 million kilowatt hours for FY2010. These values include 100 percent green power for Skenandoa House and the Kirner-Johnson Building.

Facilities

In support of the American College and University Presidents’ Climate Commitment, Hamilton College has implemented a green building policy: Hamilton will design and construct to the Silver LEED standards developed by the U.S. Green Building Council. The decision to pursue actual certification will be made on a project-by-project basis.

Hamilton’s Physical Plant maintenance practices are consistently reviewed and modified to develop best practices for operations that are environmentally sensitive and have minimal impact on the environment. The priority is to reduce or eliminate damage to the environment and assist in reducing Hamilton’s direct and indirect carbon emissions.

Hazardous materials are not a direct contributor to global warming, but they have a major impact on the environment. If not used and disposed of correctly, these products directly influence our personal well being and are extremely harmful to nature. Hamilton has developed an aggressive program to manage hazardous materials and the waste generated from their use. The College will seek to minimize the use of hazardous materials in all its operations to reduce the production and disposal of hazardous waste.

Hamilton College has used sustainable practices throughout its history. These include use of local products such as stone for its buildings and reuse of its buildings through thoughtful renovations. Management of College buildings and grounds has been sensitive to their impact on the local environment. **Hamilton will continue to manage, operate and maintain its facilities and grounds in a manner that supports and enhances the environment locally and globally.** Controlling the number and size of buildings on the campus and the amount of pavement reduces the College’s carbon footprint and storm water run-off. Hamilton will look to **reuse existing space**, eliminate excess square footage, and maintain a pedestrian campus to avoid expansion of pavement.

Energy Standards

The current average annual energy use for a Hamilton College building is 115,000 British Thermal Unit (btu) per gross square foot, based on the annual energy use from FY2006 through FY2008. **The goal when renovating existing buildings will be to reduce annual average energy consumption to 90,000 btus per gross square foot of space. New buildings will be designed to achieve a maximum energy usage of 50,000 btus per gross square foot.**

¹ LEED refers to the Leadership in Energy and Environmental Design certification system sponsored by the U.S. Green Building Council. Additional information is available at www.usgbc.org

Whenever available, new appliances and other electrical equipment on campus will be Energy Star compliant, resulting in a five percent electrical consumption reduction by 2012, equivalent to 1.3 million kilowatt hours and 643 metric tons of carbon emissions.

Heating and Cooling Guidelines

Heating and cooling guidelines for the campus are intended to balance productivity and comfort with efforts to minimize energy consumption. **In warmer months, cooling will be adjusted to between 76 and 80 degrees Fahrenheit. In cooler months, spaces will be heated to between 66 and 70 degrees.** Certain facilities will be maintained at lower winter temperatures, including

- Scott Field House: 63 to 67 degrees Fahrenheit
- Alumni Gym: 63 to 67 degrees Fahrenheit
- Blood Fitness Center: Exercise areas 63 to 67 degrees Fahrenheit, with the multi-purpose room and dance studio set to between 70 and 72 degrees for program support

These guidelines will be modified to support preservation requirements for archival material and art work, and to support specific educational programs that require different environmental requirements.

ENERGY REDUCTION INVESTMENTS

Renewable Energy

Hamilton has already invested in supplemental wind and solar systems for Kirner Johnson and solar power for the Outdoor Leadership Center (November 2008; 25 metric tons of carbon emission reduction). **As wind and solar systems improve in efficiency and drop in price in the coming years, Hamilton will consider increasing renewable energy use on campus by 3 percent** through the installation of additional systems that produce 750,000 kilowatt-hours of power and reduce carbon emissions by 370 metric tons annually.

Lighting Upgrades

Emerging technologies will be employed to reduce energy consumption for exterior lighting by **12 percent**, saving 21,000 kilowatt-hours and 10.4 metric tons of carbon emissions per year. **Interior lighting upgrades are expected to reduce consumption by 10 percent by 2015**, saving 1.5 million kilowatt hours and reducing carbon emissions by 742 metric tons.

Building Heating and Envelope Improvements

Renewal and Replacement renovation projects that reduce energy consumption in campus buildings have been identified and prioritized (see Appendix A). These projects will be prioritized based on availability of funding and potential energy cost savings. Completion of these projects is expected to result in **overall heating fuel savings of 15 percent** by 2015.

Additional energy and building retrofit projects, including conversion of electric resistance heat to more efficient and carbon friendly systems, will be identified and completed to further reduce energy consumption and help meet carbon reduction goals.

Conservation

Ongoing **Recycling Programs will result in a 10 percent annual improvement in the College's carbon footprint**, avoiding 80 tons of carbon emissions annually.

Fleet and Transportation

Hamilton's vehicle fleet has increased over the past 10 years, and includes eight-cylinder engines and larger trucks needed to plow heavy snow. Many short trips required in and around campus make the fleet relatively inefficient to operate. Since 2006, the Physical Plant has started to replace the larger inefficient vehicles with smaller, more fuel efficient models. **Vehicle replacements over time are targeted to reduce gas consumption by 20 percent before 2015**, saving 14,000 gallons of fuel and avoiding 123 metric tons of carbon emissions annually.

Carbon Sequestration

Hamilton may be able to achieve a reduction in its carbon footprint through reforestation of College-owned lands. In a Spring 2009 study, Peter Woodruff, '09 stated: *"At Hamilton College, 200 acres of reforested cropland and golf course property have the potential to offset the campus' annual C emissions by 547.7 metric tons of C-dioxide equivalents (MT CO₂e), a 2.28% annual emissions reduction."* The reforestation plan would sequester carbon, involve the entire community, and would require changes in the recreational facility options at Hamilton. Specifically, the study suggests that the entire Hamilton College golf course be reforested as well as other open land spaces. This option will be examined over the next year and the broader community will be engaged in discussions regarding the advantages and disadvantages

Air Travel

The major air travel component for Hamilton is the study abroad program managed by Hamilton College in three locations: Spain, France and China. This is an unavoidable part of important academic programs, so no reductions are anticipated.

Fuel Mix Improvements

As more renewable energy is developed for the local and national grid, the resultant **fuel mix in Upstate New York will improve**. The current mix for the electricity purchased by Hamilton is 1.09 pounds of carbon emissions per kilowatt-hour. A 25 percent reduction in carbon emissions in the fuel mix will lower the carbon emission of a kilowatt-hour to .8175 pounds. By 2025, this would reduce Hamilton's carbon emissions by 2,905 metric tons per year, assuming the electrical reductions outlined in this plan are achieved.

EDUCATIONAL EXPERIENCES

As a residential liberal arts college, Hamilton defines education in the broadest terms. Every encounter and opportunity a student has on campus and as part of the Hamilton community is developmental. Education is a thread throughout the living-learning experience. Sustainability becomes, therefore, an integral consideration in many facets of how Hamilton educates its students.

Curriculum

Hamilton has increasingly included environmental issues in its curriculum. Many courses in Biology and Geosciences have environmental components, while other disciplines have added environmental courses in the area of literature, policy, economics, ethics, religion, and technology. College courses on the Adirondack Park and on Global Warming provide focused study of environmental issues.

The College began an interdisciplinary Program in Environmental Studies in 1991 and expanded it in 2005 when a concentration (major) was added to the existing minor. The number of concentrators has been growing rapidly. This interdisciplinary program balances broad practical groundwork and focused individual study and requires coursework across several disciplines in the humanities, social sciences and natural sciences. Working closely with distinguished faculty members in biology, geosciences, government, economics, anthropology, philosophy, English and other disciplines, students investigate environmental issues and attitudes with rigor and imagination, and emerge ready to make a difference. Hamilton will **continue to develop courses and programs across the curriculum** that include sustainability issues as a focus.

Hamilton's liberal arts curriculum has been undergoing an informal transition over the past forty years, as many of its academic departments have changed how they do business following the creation of the Environmental Protection Agency in 1970. Hamilton will continue to **adopt the highest standards of environmental practice in laboratories, art facilities, and other areas** that handle hazardous materials as part of the educational and research process. We will continue to **actively educate the students on considerations for working with hazardous materials** and minimize the use and production of hazardous materials.

Research

Hamilton College encourages and supports research that complements the College's liberal arts program, including **student-faculty collaborative research**. As undergraduates, students have the opportunity to work side-by-side across all academic disciplines on important scientific projects, professional art projects, economic analyses, and research in other fields such as humanities and linguistics. These initiatives provide the opportunity to bring students closer to sustainability issues wherever they intersect with the interdisciplinary interests of Hamilton faculty. Aside from the vital intellectual engagement and public distinction that research brings to Hamilton, faculty-student collaborations increasingly result in students leading presentations at regional, national and international conferences, and occasionally to papers published in scholarly journals.

Two prestigious and noteworthy student-faculty research efforts fall directly under the sustainability umbrella:

Arthur Levitt Public Affairs Center Sustainability Program

This broad-based, multifaceted initiative promotes academic research on sustainable practices and the policies to achieve them, as well as hands-on learning experiences for Hamilton students.

- In 2006, the Levitt Center received a gift from the Blue Moon Fund to finance projects related to sustainability. Some of these funds went to professors Ann Owen, Julio Videras, Neseacan Balkan and Gwyn Kirk, who conducted research with assistance from The Levitt Center.
- 2008 Levitt Fellowship student grants related to sustainability research:
 - **Lu Qi '11** with Professor Julio Videras: "Lunar New Year 2008 Encounters Big Snowstorm: How the Natural Disaster Reveals China's Migration and Economic Structure Issues"
 - **Xiaolu Xu '10** with Professor Peter Cannavo: "The Challenge of Architectural Preservation in Booming Shanghai"
- 2007 Levitt Fellowship student grants related to sustainability research:
 - **Chris Sullivan '09** with Professor Peter Cannavo: "Local Culture and Agriculture: Community Supported Agriculture in the Northern United States"
 - **Ethan Woods '08** with Professor Erol Balkan: "Economic Sustainability: Comparing the Economics of Fossil Fuels and Alternative Energies in Central New York"

Antarctic Research

This program is supported in part by a National Science Foundation grant. Technical support for the Hamilton Antarctic & Environmental Isotope Lab is provided by the SF EMSI initiative.

- Funding for this program has allowed Professor Eugene Domack and several students to conduct research in Antarctica in 2004, 2005, 2006 and 2009, with an additional expedition planned for 2010.
- Research conducted as part of this program has resulted in the publication of numerous articles in scholarly journals.
- These facilities are also part of the Environmental Studies initiative including senior projects in and on Oneida Lake. For example, Julia Holden ('09) used the carbon isotope lab to study input of particulate carbon into the lake as it reflects land use and agricultural practices, storm runoff, and so forth.

Environmental Molecular Sciences Initiative

With support from the Sherman Fairchild foundation, the EMSI has given Hamilton the capacity to use rigorous analytical methods to investigate environmental materials at the molecular level. Subjects of research include brown fields and iron reducing bacteria.

Hamilton will continue to **foster and support student and faculty research that focuses on environmental issues and sustainability practices**. One such program has been focused on habitat management and studies of rare species in the Rome Sand Plains. This research project has included two Hamilton faculty members and a group of 2 to 4 students every summer since 2000.

Outreach

Groups and Activities

- The **Recycling Task Force** (RTF) is a student-run organization that champions the College's recycling efforts across its campus and develops education programs to continuously improve Hamilton's recycling metrics.
- The **Hamilton Environmental Action Group** (HEAG) is a second student-run organization that raises awareness about the environment both on campus and in the surrounding community, through advocacy, education and strategic partnerships with the College administration.
- The **Campus Sustainability Committee** (or "Green Team") is comprised of faculty, staff, students, alumni and trustees who manage Hamilton's program with the ACUPCC.
- **Recyclemania.** Hamilton participates in this national competition since 2005 as a way to reinforce the traditional "3 R" core values: reduce, reuse, recycle.
- **Focus the Nation** (and other sustainability-oriented public forums). Hamilton has facilitated numerous public programs that bring together members of the College community and the public for interactive forums that educate and debate issues related to global warming.
- **Peer-to-Peer Education and Outreach.** Hamilton uses members of its student organizations (RTF and HEAG) to serve as de facto "eco-reps" for facilitating environmental education within student residences. More recently they began a similar program in administrative buildings, relying upon green-office advocates to implement a "Green Office Pledge" program that targets conservation and minimizes waste.
- **Green Week.** HEAG sponsors and champions educational events during each semester's Green Week observances. The spring semester's events coincide with Earth Day.
- **Dorm Competitions.** Hamilton students, using the College's "Building Dashboard" system, staged their first dorm energy battle in the fall of 2008. These competitions will be continued to both promote and realize reductions in student energy use through conservation.
- **Adirondack Adventure.** This program exposes about half of the students in each first-year class to the natural beauty and physical challenge of the Adirondack Mountains. Students who participate in this program gain a greater appreciation for the need to protect and conserve this wilderness for future generations.

The Hamilton College Arboretum

The Hamilton Arboretum includes 400 acres of managed land on the College campus and trace its origins to 1850 and the Root Glen. The mission and purpose of the Hamilton College Arboretum is to:

...preserve the stately historic campus landscape, building upon the diversity of the collection with sustainable species, and reinforcing the aesthetic character of the campus. Additionally, it seeks to provide visitors with a broader understanding of the campus landscape and promote long-term stewardship of the environment.

The Arboretum is linked historically to the Root family and administered by the College. It provides educational opportunities through tours and educational seminars for local arborists and interested enthusiasts. By integrating sustainability through community outreach and education, the Hamilton College Arboretum promotes environmental stewardship on and off campus.

Community Garden

A new three-quarter acre community garden on campus is managed by students and members of the greater College community on a plot-by-plot basis. The mission of the garden is to “dedicate itself to furthering the value of sustainability by utilizing sustainable and organic techniques and offering an outdoor classroom for students to experientially learn these values.” Originally funded by a grant from the President’s office, the garden now receives on-going funding for seeds, plants and supplies from Bon Appetit, Hamilton’s food service provider. Some of the garden’s produce is sold back to Bon Appétit to complement its organic food offerings in College dining halls, or consumed by students living in the nearby food cooperative. One plot—the Heritage Garden—contains crops and uses techniques that would have been common at Hamilton’s founding in 1812. It is managed by faculty members and students involved in an academic seminar titled “Food for Thought”.

Hamilton will **continue supporting and fostering initiatives that encourage student and employee involvement in sustainability issues.**

Community Service & Strategic Local Partnerships

Hamilton College has a long tradition of creating community service and service-learning programs that integrate the College community with the Mohawk Valley region and beyond. These programs enable Hamilton students, faculty members and staff to focus on a broad range of social, economic and environmental challenges including:

- Hamilton Association for Volunteering, Outreach & Charity (HAVOC)
- Alternative Spring Break (ASB)
- Students Helping in the Naturalization of Elders (Project SHINE)
- Hamilton College Community Outreach Campaign
- Each year volunteers from Hamilton join with 50 to 100 other people from the greater Utica community to help clean up the Utica Marsh

In addition, the Hamilton College Town-Gown Fund Committee administers and distributes annual grants to local education, public safety and other community organizations in the Town of Kirkland. In 2009, nine grants totaling nearly \$45,000 were awarded, bringing the total financial investment in the local community to \$236,000 over the past eight years.

Another example of community involvement is Jenney Stringer '08, who began the Community Garden Project initially through a Levitt Summer Civic Engagement Fellowship in 2007. She organized the community effort to create a garden at the FX Matt (public housing) apartments. Jenney's vision for former refugees of the Soviet Union, Belarus, Somalia and Ukraine was to transform an empty lot of grass to a place where families of different backgrounds could create beauty and abundance in vegetable and flowers, gardening together in peace. They started the gardening process in advance of the outdoor growing season in Hamilton's greenhouse. There are 30 raised-bed garden plots, each 12 ft. by 16 ft. by 20 ft. in dimension. Each plot is registered to a specific family living within the housing complex. The Utica Municipal Housing Authority built a fence around the gardens and provided access to water. The Community Foundation and Home Depot also provided significant support.

In the coming years, Hamilton College intends to make significant reductions in its carbon footprint through conservation and efficiency. Simultaneous to these actions, Hamilton will use community service and strategic local partnerships to realize additional emissions reductions through local carbon offsets. For example,

Hamilton may sponsor a community exchange program to collect incandescent lamps from the community and replace them with a CFL or LED, or the College may **integrate sustainability considerations into existing community service programs** to increase the scope of its educational awareness efforts.

FINANCING PLAN

Appendix A outlines specific projects and the funding needed. The projects will be funded from the annual budget using renewal and replacement funds. Hamilton will also work with state and federal agencies to obtain funding.

TRACKING PROGRESS

Hamilton College will track its progress toward carbon neutrality through regular inventories of its carbon emissions and reviews of environmental programs to ensure they meet intended objectives.

Specific metrics include:

- Total carbon emissions from inventory updates
- Dashboard Elements
 - Gross square footage per student – density factor
 - Carbon emissions per student
 - Carbon emissions per gross square foot – density factor
 - Energy expended (btu) per gross square foot
- Building Thermal Conductance Measurement – before and after energy improvements
- Energy use levels needed to meet carbon emission reductions by 2025:
 - Electricity: 23,000,000kwh (FY09 projected 26,500,000 or a 13 percent reduction required)
 - Natural Gas: 100,000 therms (FY09 projected 1,300,000 or a 23 percent reduction)
 - Gasoline Fleet and College Travel: 60,000 gallons (FY09 projected 70,000 or 14 percent reduction)
 - Diesel Fuel (includes athletic bus travel): 15,000 gallons (FY09 projected 16,500 or 9 percent reduction)
 - Renewable Energy Credits: 6,000,000kwh (Constant- no increase)
 - Fuel Mix Improvements: .8175 pounds CO₂e per kwh (FY09 at 1.09 pounds/kwh or 20 percent improvement)

APPENDIX A: ENERGY RELATED REPAIR AND RENOVATION PROJECTS

<i>Building</i>	<i>Project</i>	<i>Estimate Payback in Years</i>	<i>Energy Reductions kwh</i>	<i>Energy Reductions therms</i>	<i>Carbon Reductions MTCO2e</i>
<i>Exterior Lighting</i>	<i>Replace HID bulbs with LED's (Phase 1 - 100 lights)</i>	<i>5.5</i>	<i>65,700</i>		<i>32</i>
<i>Exterior Lighting</i>	<i>Replace HID bulbs with LED's (Phase 2 - 400 lights)</i>	<i>4.9</i>	<i>262,800</i>		<i>130</i>
<i>Exterior Lighting</i>	<i>Replace HID bulbs with LED's (Phase 3 - 500 lights)</i>	<i>4.9</i>	<i>328,500</i>		<i>162</i>
<i>Emerson Hall</i>	<i>Upgrade Heating & Lighting Systems (Addition and Renovation)</i>		<i>(420,000)</i>	<i>15,000</i>	<i>(133)</i>
<i>Bristol Pool</i>	<i>Upgrade Lighting w/New Metal Halide Lamps & T-8 Lamps/Ballasts</i>	<i>5.3</i>	<i>67,500</i>		<i>33</i>
<i>Alumni Gym</i>	<i>Upgrade Lighting w/New Metal Halide Lamps & T-8 Lamps/Ballasts</i>	<i>5.7</i>	<i>35,000</i>		<i>17</i>
<i>Sage Rink</i>	<i>Upgrade Lighting in Rink w/New Metal Halide Lamps</i>	<i>12.8</i>	<i>47,000</i>		<i>23</i>
<i>Sage Rink</i>	<i>Rpl Dehumidifiers with Enthalpy Wheel</i>	<i>13.0</i>	<i>108,000</i>		<i>53</i>
<i>McEwen</i>	<i>Change Cooking Equipment to Natural Gas</i>	<i>13.1</i>	<i>117,000</i>	<i>(3,990)</i>	<i>38</i>
<i>CA Johnson</i>	<i>Upgrade Lighting system</i>	<i>14.6</i>	<i>35,600</i>		<i>18</i>
<i>McEwen</i>	<i>Upgrage Lighting system</i>	<i>15.0</i>	<i>42,800</i>		<i>21</i>
<i>Burke Library</i>	<i>Mechanical System Upgrade to Hydronic</i>	<i>15.3</i>	<i>1,840,000</i>	<i>(78,500)</i>	<i>517</i>
<i>McEwen</i>	<i>Replace Heating system</i>	<i>18.1</i>	<i>390,000</i>	<i>(16,650)</i>	<i>110</i>
<i>East Bundy ResHall</i>	<i>Install Hydronic Heating Sys</i>	<i>18.6</i>	<i>320,000</i>	<i>(10,925)</i>	<i>104</i>
<i>West Bundy ResHall</i>	<i>Install Hydronic Heating Sys</i>	<i>18.6</i>	<i>320,000</i>	<i>(10,925)</i>	<i>104</i>
<i>Babbitt ResHall</i>	<i>Replace Electrical Heating System with Hot Water System</i>	<i>23.5</i>	<i>600,000</i>	<i>(25,605)</i>	<i>169</i>

Milbank ResHall	Replace Electrical Heating System with Hot Water System	23.5	600,000	(25,605)	169
Burke Library	Upgrade Lighting system	28.7	69,800		35
9 Stryker Lane	Rpl Windows	29.5		200	1
8 CHR	Rpl Windows	37.8		250	1
Dunham	Reinsulate Piping Attic	41.7		500	3
CA Johnson	Upgrade Mechanical System (install full bldg air cond.)	51.0	46,000		23
Alumni Gym	Upgrade mechanical system	105.5	10,000	2,000	15
Root Farm House	Replace Windows - 50 units	171.2		230	1
Wally J. ResHall	Rpl Windows	175.5		350	2
Career Center	Replace Windows	196.9		60	
Ferry Building	Replace Existing windows (32 units)	196.9		60	
Babbitt ResHall	Replace Exterior Window Curtain Walls				
Bristol Center	Upgrade Lighting, Electrical Circuits 3rd Floor				
Bristol Center	Upgrade mechanical system - Air Condition				
Bristol Center	Windows in Poor Condition - Replace				
Buttrick	Rpl Windows				
Chapel	Upgrade Lighting system				
Couper Hall	Replace Insulation Heating System Basement				
Couper Hall	Upgrade Lighting system				
Dunham	Reinsulate Heating Pipes Basement Boiler Room				
Elihu Root House	Rpl Windows Historical Front of Building				
Elihu Root House	Rpl Windows with new replacement				

windows Back Part

<i>Keehn ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>Keehn ResHall</i>	<i>Upgrade Lighting system</i>
<i>List Art Center</i>	<i>Replace Window Curtain Walls</i>
<i>List Art Center</i>	<i>Upgrade Lighting system</i>
<i>List Art Center</i>	<i>Upgrade mechanical system</i>
<i>Major ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>Major ResHall</i>	<i>Upgrade Lighting system</i>
<i>McEwen</i>	<i>Replace Window Curtain Walls</i>
<i>McInstosh ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>McInstosh ResHall</i>	<i>Upgrade Lighting system</i>
<i>Milbank ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>Minor ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>Minor ResHall</i>	<i>Upgrade Lighting system</i>
<i>Root Hall</i>	<i>Rpl water heater</i>
<i>Root Hall</i>	<i>Rpl Windows</i>
<i>Root Hall</i>	<i>Upgrade Heating System & Local Controls</i>
<i>Root ResHall</i>	<i>Replace Exterior Window Curtain Walls</i>
<i>Schaumbach</i>	<i>Upgrade Temperature Control Cabinets</i>
<i>Scott Field House</i>	<i>Upgrade Lighting w/New Metal Halide Lamps</i>
<i>Wellin Hall</i>	<i>Improve Lighting in Lobby</i>

Total Reductions: 4,885,700 (153,550) 1,648