Long-range planning for sustainability and climate neutrality at Hamilton College
# Hamilton Climate Action Plan

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EXECUTIVE SUMMARY

Hamilton’s Climate Action Plan provides a framework for reducing carbon emissions with the ultimate goal of being carbon neutral. Interim goals include reducing Hamilton’s 2007 baseline carbon inventory by 20 percent by 2015, subsequent reductions of 20 percent every ten years for an 80 percent reduction by 2045, and carbon neutrality by 2050. As noted by a member of Hamilton’s Green Team, this plan should be considered an “adaptable response” to the environmental concerns we face. The plan should be modified and updated as our experience grows and technology develops.

The Climate Action Plan establishes baseline renovation and construction standards, including energy consumption targets. It also outlines heating and cooling guidelines for facility operations, purchasing policies for appliances and equipment, renewable energy investments that are planned, and strategies for recycling; transportation and conservation.

Education efforts are also discussed. Education efforts are aimed at sending Hamilton students out into the world to serve as knowledgeable and responsible citizens.

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.

1 E. Williams, 2009.
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 pollution prevention and resource conservation. 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.
- Emphasize 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 22,540 net metric tons of carbon dioxide emissions per year. By 2009, as a result of ongoing sustainability efforts, Hamilton reduced its carbon output approximately 8.5 percent to 20,617 net metric tons.

Based on the fiscal year 2009 carbon inventory, 72 percent of Hamilton’s greenhouse gas production was attributed to its facilities and their electrical and heating fuel use, while 17 percent was the result of air travel for study abroad programs and college financed travel. (See Figure 1 for individual source emissions – data represents gross tonnage.)
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, Hamilton also strives to be a good steward of the environment by 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 (18,032 MTCO2e)
- **FY2025:** 40 percent reduction (13,524 MTCO2e)
- **FY2035:** 60 percent reduction (9,016 MTCO2e)
- **FY2045:** 80 percent reduction (4,508 MTCO2e)
- **FY2050:** Carbon Neutral
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 results 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 2,200 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 LEED\(^2\) 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.

\(^2\) 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
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.

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 536 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 & Fuel Mix Improvements

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 270 metric tons annually.

As more renewable energy is developed for the local and national grid, the resultant fuel mix in Upstate New York will improve. The FY2006 mix for the electricity purchased by Hamilton was .9562 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 .717 pounds. By 2025, this would reduce Hamilton’s carbon emissions by 2,670 metric tons per year, assuming the electrical reductions outlined in this plan are achieved. (As of 2009, total pounds of carbon emissions per kilowatt-hour are .795)

Lighting Upgrades

Emerging technologies will be employed to reduce energy consumption for exterior lighting by 12 percent, saving 21,000 kilowatt-hours and 7.6 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 541 metric tons.

Building Heating and Envelope Improvements

Renewal and Replacement renovation projects that reduce energy consumption in campus buildings are being identified, and 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 (900 metric tons) 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.

Hamilton will continue to use energy management equipment for computers and AV equipment in public locations and classrooms to minimize energy consumption. Machines are put to sleep after a period of inactivity and automatically shut down for the night.

Fleet, Transportation & Air Travel

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 22 percent before 2015**, saving 13,000 gallons of fuel and avoiding 123 metric tons of carbon emissions annually.

Commuting to Hamilton by Hamilton faculty and staff contributes 3 percent to Hamilton’s carbon footprint. The College will promote carpooling for employees and students through the campus Ride Board at the My Hamilton web site.

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.

**Carbon Sequestration**

Hamilton may be able to achieve a reduction in its carbon footprint though 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 C02e), a 2.28% average annual emissions reduction.”** The reforestation plan would sequester carbon, involve the community, and would necessitate changes in the recreational facility options at Hamilton. Specifically, the study suggests that the Hamilton College golf course be reforested as well as college-owned cropland. This option will be examined over the next year and the broader community will be engaged in discussions regarding the advantages and disadvantages.

**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, so 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 emphasize direct study of the environment, while other disciplines add environmental topics in literature, policy, economics, ethics, religion, and technology. 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 by adding a concentration (major) to the existing minor. The number of concentrators has grown 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. Hamilton will **continue to develop courses and programs across the curriculum** that include environmental issues as a focus.
Hamilton’s liberal arts curriculum has undergone 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 continues to adopt the highest safety standards 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 students about working with hazardous materials and minimize the use and production of hazardous materials as part of our plans to make the campus as sustainable as possible.

Research

Faculty at Hamilton College are teacher-scholars who engage in research that complements the College’s liberal arts program. Hamilton undergraduates are taught by faculty who have active research agendas related to sustainability. The involvement of Hamilton faculty with sustainability research enhances the quality of the undergraduate instruction on these issues and fosters a deeper engagement with issues of sustainability among the students. In addition, an important part of the faculty scholarship is collaborative research with students. Undergraduates 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 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, students develop expertise in a discipline through these research collaborations as they learn to solve problems and to write and speak about their projects. The collaborations occasionally lead to students making public presentations at regional, national, and international conferences and to coauthoring papers published in scholarly journals. The number of environmental and sustainability based projects by students and faculty are increasing rapidly.

Several prestigious and noteworthy faculty and 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. Student grants related to sustainability research have covered a range of topics, including natural disasters and economic structures in China, community supported agriculture, and the economics of fossil fuels and alternative energies.

Antarctic Research

The Antarctic program is supported in part by a National Science Foundation grant. Funding for this program has allowed a faculty member 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.

Oneida Lake and Rome Sand Plains

The Environmental Studies initiative includes senior projects in and on Oneida Lake. For example, one project used the carbon isotope lab to study input of particulate carbon into the lake as it reflects land use, agricultural practices, and storm runoff.
Student-faculty collaborative research has 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 two to four students every summer since 2000.

**Environmental Molecular Sciences Initiative (EMSI)**

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.

**Outreach**

**Groups and Activities**

- The **Recycling Task Force** (RTF) is a student-run organization that champions the College’s recycling efforts across 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.
- **Ham Cram and Scram** is an annual effort to collect reusable materials from students in residence halls. These items are stored for the summer and resold in the fall. Surplus bedding and clothing is donated to the Salvation Army and the Humane Association. Books and food items are also donated to local charities. This effort diverts substantial waste from landfills.
- 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, and recycle.
- **Focus the Nation** and other sustainability-oriented public forums are 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 Community Farm Garden

The Hamilton Arboretum includes 400 acres of managed land on the College campus and traces 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.

A new three-quarter acre Community Farm 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 1812 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”.

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.

One example of community involvement is a student-initiated Community Garden Project, an effort to create a garden at the FX Matt (public housing) apartments. Former refugees of the Soviet Union, Belarus, Somalia and Ukraine transformed 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 project areas identified to date with the funding required, which once implemented, will move Hamilton towards climate neutrality. 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 use 25,839,000kwh or a 11 percent reduction required)
  - Natural Gas: 1,000,000 therms (FY09 use of 1,267,000 therms or a 21 percent reduction)
  - Gasoline Fleet and College Travel: 47,000 gallons (FY09 use of 60,000 gal or 22 percent reduction)
  - Diesel Fuel (includes athletic bus travel): 13,000 gallons (FY09 use 14,045 gal or 7 percent reduction)
  - Renewable Energy Credits: 6,200,000kwh (Constant- no increase)
  - Fuel Mix Improvements: .717 pounds CO2e per kwh 25 percent improvement
## APPENDIX A

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<tr>
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