

# Bryn Mawr College Climate Action Plan

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# BRYN MAWR COLLEGE



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### EXECUTIVE SUMMARY

Bryn Mawr College affirms the importance of prioritizing sustainability efforts, reducing our carbon footprint, and above all, educating generations of students so they may make positive change in an interdependent world. A Bryn Mawr education is designed 1) to prepare Bryn Mawr students to be active citizens in an increasingly global context, and 2) to educate undergraduate women who are prepared to transform and improve lives in their own communities and throughout the world.

This Climate Action Plan has been generated by the Bryn Mawr College Sustainability Committee as part of a broader plan to support and increase environmental awareness and sustainability efforts. The American College and University Presidents Climate Commitment (ACUPCC) has provided the College with a welcome opportunity to re-examine and re-imagine our efforts to reduce our carbon emissions and educate our community.

This plan recommends the College take a number of steps toward reducing our carbon emissions due to energy consumption and transportation from our 2008 baseline by 10% over the next ten years. These steps include:

- Restrict campus growth.
- Analyze HVAC, electrical and lighting systems, motors, boilers and building envelopes to determine improvements that will result in lower energy usage. Evaluate alternative energy source options for campus buildings.
- Review operational protocols in all buildings to determine changes that will result in reduced energy consumption by closing buildings or portions of buildings when possible.
- Institute a high profile education program for students, staff, faculty and administration regarding behavioral changes that reduce energy.
- Continue to stay abreast of changes in technology and immediately invest in new technology that reduces the use of energy and emissions and that has a reasonable return on the capital investment.
- Require department heads to determine if air travel by faculty and staff members in their department is necessary.
- Implement an incentive program for commuting students, faculty and staff by funding, at some level, the cost of mass transit and providing a financial incentive for carpooling or biking.
- Implement a policy that will require departments and offices to purchase alternative fuel vehicles when the overall cost of operating these vehicles compares favorably with traditional vehicles. The policy will also address vehicles rented for College business.

Bryn Mawr College has already taken steps to make climate neutrality and sustainability a part of the curricular and co-curricular offerings for its students as well as for its faculty and staff. The College envisions the following new steps:

- Strengthen connections between its curricular philosophies and the principles of environmental stewardship.
- Expand Bi-College course offerings in Environmental Studies.
- Expand Environmental Studies course offerings across disciplines.
- Explore offering Emily Balch Seminars on the environment.
- Strengthen the interdisciplinarity of the faculty.
- Increase institutional capacity for experiential, service learning available for academic credit.
- Explore student opportunities for not-for-credit environmental literacy experiences
- Encourage Study Abroad and Exchange Programs as ways to enrich learning experiences.

Further, Bryn Mawr College plans to expand research related to the achievement of climate neutrality. Such plans include the following:

- Encourage undergraduate participation in scientific research on topics related to environmental sustainability.
- Initiatives by Dean's Office and Environmental Studies Program to increase awareness of the College's fellowships and Green Grants for summer opportunities to engage in in-depth work on environmental sustainability.
- Increase awareness of faculty research and scholarship on the environment.
- Promote research that integrates pedagogy with professional development on topics related to environmental science for K-12 teachers.
- Encourage students, staff, and faculty to explore sustainability issues through the College's Teaching and Learning Initiative.
- Foster student research projects that study energy efficiency of the Bryn Mawr campus.

### INTRODUCTION: THE COLLEGE'S CARBON FOOTPRINT

In 2008, Bryn Mawr College engaged Sightlines LLC, a facilities asset management firm, to assist with the preparation of our greenhouse gas (GHG) inventory. As reported to the ACUPCC, the College's total carbon emissions for FY2008 were 15,634 metric tons of carbon dioxide equivalent (MTeCO<sub>2</sub>). This worked out to 9.5 MTeCO<sub>2</sub> per full time enrollment, or 11.7 MTeCO<sub>2</sub> per 1,000 square feet of building space.

The GHG inventory occurred ten years after the College initiated a major energy-conservation campaign that included widespread installation of high-efficiency lighting systems, more efficient power distribution, and implementation of a digital, campus-wide energy management system.

The 2008 GHG inventory included Scope 1, 2, and 3 carbon emissions and was calculated using the Clean Air – Cool Planet Campus Carbon Calculator. Emissions sources included in the calculations were: Scope 1 - fossil fuel and our vehicle fleet, Scope 2 - purchased electricity, and Scope 3- faculty/staff commuting, air travel, and solid waste. The inventory revealed that the College's single largest greenhouse-gas contributor was purchased electricity, accounting for 57% of total emissions. On-campus, stationary-source combustion of natural gas and #2 fuel oil was the second largest contributor, at 24% of total emissions. Air travel was the third largest, at 14% of total emissions. Several other components were included—such as faculty/staff commuting (3%), the College's vehicle fleet (1%), and solid waste (1%)—but accounted for a combined total of 5% of total emissions.

In the ten years before the GHG inventory, the College increased its gross square feet by 6% and added air conditioning to 185,000 useable square feet, or 15% of campus. During this ten year period, the College's use of electricity increased only 5.3%, which is attributable to the efficiencies and actual reductions achieved through our 1998 energy conservation measures.

## MITIGATION GOALS AND STRATEGIES

Bryn Mawr College will reduce its carbon footprint by 10% in the next ten years.

### A. Energy consumption

Since 80% of our footprint is due to on-site energy consumption the plan focuses on reducing this consumption, particularly the use of electricity which constitutes 54% of our carbon footprint. The College has little control of the methods of electrical generation since that is determined by the utility company that supplies electricity in Eastern Pennsylvania. Our ability to produce electricity on site is very limited by our location which is a very densely populated suburban area zoned residential by the local government. However, the College is committed to purchasing as much of its energy as possible from renewable sources. At present, there is a lack of renewable energy capacity, both regionally and nationally. To address this fundamental problem, the College will work with other institutions of higher education to support the growth of alternative energy sources as well as other sustainability initiatives.

Our goal is to reduce our carbon emissions from our 2008 baseline by 10% over the next ten years by taking the actions listed below. This will require more than a 10% reduction overall since we will also need to offset the anticipated growth in demand which has been averaging 0.2% per year.

#### 1. Restrict campus growth.

Over the next ten years, the College will not add any additional square footage that requires electrical power or heating fuel; nor will it change the use of any existing space in a way that results in the additional consumption of energy. The only exception to this policy will be if the College significantly expands the size of the student body. In addition, in order to ensure that the utilization of campus space results in less energy usage and not more, the following practices will be instituted:

- a. During building renovations, systems will be upgraded and made more efficient in order to reduce the amount of energy used.
- b. There currently are a number of non-historic small campus buildings that do not significantly support the Colleges programs. The College will move the functions located in some of these buildings to other spaces in order to make possible demolition of some of the buildings, which will result in a reduction in energy usage.

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2. Analyze HVAC, electrical and lighting systems, motors and boilers in campus buildings to determine improvements that will result in lower energy usage. Analyze building envelopes to determine ways to reduce thermal losses. Evaluate alternative energy source options for campus buildings including combined heat and power (CHP), solar thermal and photovoltaics, wind energy and geothermal energy. The College has already implemented many initiatives during the past decade to reduce energy consumption on campus including:
  - Installation of a computerized energy/temperature management system that includes temperature sensors in over 500 indoor locations throughout campus and that provides for the rapid and precise control of temperatures from a remote location.
  - Lighting system upgrades. High efficiency fluorescent lighting has been installed in about 98% of all campus locations. LED lighting has been installed in common areas in one dormitory, Denbigh Hall. All exit signs on campus use LEDs, a 90% energy reduction compared with incandescent fixtures.
  - Energy Star appliances are purchased whenever it is feasible to do so.
  - The number of transformers used for power distribution on campus has been reduced.
  - Variable frequency drives have been installed in fans and pumps to reduce energy consumption in HVAC systems by matching output to demand.
  - Nine campus buildings have had their boilers replaced with more efficient heat sources.
  - There is an annual dormitory competition to reduce energy use (“energy diet”). The competition is largely organized by the students, particularly the BCM Greens group.
  - Major boilers for heating systems on campus all have the capability to run on natural gas, resulting in reduced carbon emissions per BTU. Natural gas-powered emergency generators for emergency use provide longer running time and cleaner emissions than the diesel powered units they replaced.

Currently, the College is studying, with outside consultants, energy usage in the science building complex, in which about 30% of all campus energy is consumed. The study will include an analysis of historical usage of electric, natural gas and other utilities and will provide specific analyses about the following:

- Combustion analysis on boilers to measure fuel-to-steam efficiency.
- Space conditioning systems, the impact of HVAC system loads on energy consumption and lab hood energy consumption.
- Energy efficient motor analysis for discrete motors over 10 hp including a premium efficiency motor replacement economic analysis and an analysis of changes in motor drive systems such as the installation of variable frequency drives and changes to belt driven equipment.
- Lighting systems, featuring plans for further upgrades to lighting equipment and controls, including the installation of LED lighting systems.
- Electrical distribution system to determine potential modifications to improve its energy transmission.
- Options to reduce natural gas consumption, including waste heat recovery and changes in equipment and operating procedures.

Similar studies will be conducted in other buildings where there is a potential for the identification of building improvements that will result in reduced energy consumption.

3. The operational protocols in all buildings will be reviewed in order to determine changes that will result in reduced energy consumption. The review will focus on operating hours of buildings and portions of buildings. We will consider closing buildings during fall, spring and winter breaks and periods in the summer when buildings are minimally occupied. The study of the science complex will help us determine ways in which changes in operating protocols and hours can decrease energy usage. We will use the information from this study to assist in the review of all other major College buildings, and where we think additional study is needed, will conduct other building reviews with the help of outside consultants.

The building studies will provide the information in order to make operational changes as follows:

- a. The building studies will identify activities that require continual energy consumption that could be located together in one portion of a building so that some equipment in the remainder of the building, such as fume hoods, can be turned off for periods of time each day.

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- b. The studies will also determine periods of time when there is minimal usage of areas of buildings and these areas will be closed for those time periods so that heating and cooling demand and other system usage can be reduced.
- 4. The College will institute a high-profile education program for students, staff, faculty and administration regarding behavioral changes that reduce energy consumption including lighting and electronic equipment usage. In addition, policies will be implemented that will mandate a reduction in energy usage on campus. The College will centrally change temperature set points and educate the community about the necessity of doing this so that these changes are supported by students, staff and faculty.

### **The education program will focus on the following areas:**

- a. Energy consumption reductions by turning off computers, printers and other equipment at the end of each day or for any extended time period during which the equipment will not be used.
- b. Turning off lights when leaving a room.
- c. The use of power strips to turn off multiple pieces of equipment with one switch.
- d. Increased recycling by ensuring that the community members know how and what can be recycled, followed by efforts to highlight and enforce the proper practices.
- e. Peak-time energy consumption reduction strategies (i.e. doing laundry in non-peak times), and alternate event scheduling times when possible.
- f. Students will be encouraged to study in public spaces where lights are already turned on rather than illuminating additional rooms; in other words, consciously reduce room lighting use per student.

### **Energy use policies will be implemented in the following areas:**

- a. The policy to purchase energy efficient appliances and equipment will be formalized.
- b. In purchasing equipment, the life cycle cost, including energy costs, will be considered rather than just considering the purchase price. The cost of carbon credits also will be included in the cost analysis. Thus, if a piece of equipment creates less CO<sub>2</sub> output, that will factor into the cost analysis.

- c. A policy limiting the amount of energy students use in dormitory rooms. The policy might restrict the possession of refrigerators and other appliances and require using compact fluorescent or other efficient light bulbs in lieu of incandescent bulbs.
  - d. A policy of regulating temperature set points approximately two degrees higher in the summer and two degrees lower in the winter than the current set points.
  - e. A policy to further restrict the number of students permitted to bring cars to campus. Students must now complete an application to receive permission to bring a car to campus and fewer than 100 are approved each year.
5. The College will continue to stay abreast of changes in technology and immediately invest in new technology that reduces the use of energy and emissions and that has a reasonable return on the capital investment from energy cost reductions and other life cycle considerations (maintenance cost, replacement cycle etc).

## **B. Transportation**

The second largest contributor to our carbon footprint is from faculty and staff work-related air travel, which produced about 18% of our calculated footprint. The College will institute policies described below designed to reduce the amount of air travel in order to reduce our carbon footprint from this source by 10%. Another transportation related source of our carbon footprint is the faculty, staff and student commute to the College. The College will institute policies described below that are expected to reduce the amount of commuting travel in order to reduce our carbon footprint from this source by 10%. A third source of transportation related carbon emissions is the use of College-owned vehicles for the transportation of students for academic and co-curricular programs, and staff in performing their work duties. The College will institute policies described below that are expected to reduce this source of the carbon footprint by 10%.

1. A policy will be implemented requiring department heads to determine if air travel by faculty and staff members in their department is necessary. The department heads will consider the possibility of combining trips so that the work can be accomplished with less air travel and the possibility of attending small-group meetings through web-based conferencing. In addition, department heads will be required to document air miles traveled, to improve the accuracy of future greenhouse gas inventories.

2. The College will implement an incentive program for commuting students, faculty and staff by funding, at some level, the cost of mass transit and providing a financial incentive for carpooling or bicycling to work. Currently, the College participates in a program permitting faculty and staff to purchase monthly passes for the Southeastern Pennsylvania Transportation Authority (SEPTA) on a pre-tax basis. Also, the parking fees for students, faculty and staff will be increased in order to provide some of the funding for the new commuting incentive programs. A survey of faculty, staff and students will be conducted to help identify opportunities for reducing travel and to increase the accuracy of the estimate of our commuting-related emissions.
3. The College will implement a policy that will require departments and offices to purchase alternative fuel vehicles when the overall cost of operating these vehicles compares favorably with traditional vehicles. The policy will also address vehicles rented for College business. The cost of fuel over the expected life of the vehicles will be considered in the financial analysis of determining whether it makes economic sense to purchase an alternative fuel vehicle. The cost of carbon credits will also be included in the cost analysis. Currently the College operates:
  - a. Six fleet vehicles that consume 5% biodiesel fuel. Diesel-powered off-road equipment used on campus is also run on 5% biodiesel.
  - b. One natural gas-powered bus fueled by the College-owned compressed natural gas filling station.
  - c. Three hybrid gasoline/electric vehicles used by the Department of Public Safety.
  - d. The College will consider instituting a bike share program in order to reduce the need for students to bring cars to campus and to reduce the number of bus trips between Bryn Mawr and Haverford colleges.
  - e. A shuttle bus service between Bryn Mawr , Haverford and Swarthmore Colleges since students take courses at all three colleges. This reduces the use of individual student cars, and is served by the College's CNG-powered bus.

## MITIGATION PLAN IMPLEMENTATION

The College Sustainability Committee will oversee the development of the policies that will result in meeting our goal of reducing the College carbon footprint by 10% within the next ten years. The Committee has faculty, student and staff representation. The Committee will work with other College committees on sustainability issues including the student greens organization, the Sustainable Food Committee and the student recycling representatives. The community will be surveyed at least every two years as a way to measure the progress in changing behaviors and to evaluate our sustainability education programs.

A sustainability coordinator will be hired as a joint appointment of Bryn Mawr and Haverford Colleges. The coordinator will work with the Committee in the development and implementation of sustainability policies, in the sustainability education program for the community, in the continuing work of researching and determining additional methods for reducing the College's carbon footprint and in leading other campus sustainability programs which are described below.

### A. Recycling:

- The College has single stream recycling for glass, paper, cardboard, aluminum, steel and plastics #1 – 7. Each residence hall has a student recycling representative who is responsible for promoting recycling in their dormitory. The representatives also meet periodically with College Housekeeping and Facilities Services staff to discuss pick-up methods and other facets of the recycling program to continually increase the amount of material recycled on campus. The sustainability coordinator will work with the recycling representatives to participate in the EPA's Recyclemania program beginning with the 2010 – 2011 year. The College will produce an annual sustainability report showing our progress.
- The College also recycles scrap metal, computers and other electronics, rechargeable batteries, fluorescent lamps, mercury-containing products (thermostats, switches, electronics), motor oil, refrigerants, ink/toner cartridges and non-hazardous construction and demolition wastes (carpet, concrete, steel, lumber, glass).

### **B. Dining Services Sustainability Program:**

- There is a student volunteer-run vegetable garden that supplies herbs used by Dining Services.
- Seafood purchases are done in accordance with the Monterey Bay Aquarium “Seafood Watch” guidelines.
- Milk purchased is 100% hormone-free. Fair-trade certified coffee is purchased exclusively.
- The College supplies students with reusable water bottles and provides discounts for beverages purchased in reusable mugs or bottles.
- The College maintains a food waste reduction campaign in which waste is collected and weighed to raise awareness.
- Waste cooking oil is collected by an outside company that uses it to produce biodiesel fuel.
- The academic year opening picnic dinner for the community promotes locally produced foods and there are special dinners for students each year where only locally produced foods are served. The College regularly purchases some local products including some fruits and vegetables.
- College staff members and students volunteered with an area group to help establish a farmer’s market in the town of Bryn Mawr that sells exclusively locally-produced food items.

### **C. Resource Conservation:**

- Landscaping waste is composted locally.
- The College manages an end-of-year sale for redistribution of clothing and other items left or donated by students. Items not sold are donated to charities. Proceeds from the sale fund an annual award made by the College Staff Association to recognize a community member who demonstrates the spirit of greening the campus.
- Front-loading washing machines have been installed in all dormitories to conserve water.
- Closed loop cooling-water systems are installed in all new laboratories that require cooling water.
- 100% low-flow/low volume fixtures have been installed in all residence hall showers and toilets.

**D. Purchasing:**

- The College is in the process of implementing an on-line purchasing system. The system will permit the consolidation of purchases to commonly-used vendors, such as the office supplies vendor, so that deliveries to campus can be reduced from several times per week to one or two times. The system will also permit the identification of “green” items that will become preferred items for faculty and staff members to purchase.
- Copy paper purchased for the College has 30% postconsumer recycled content.
- Housekeeping products are purchased as concentrates, distributed and used through auto-diluting dispensing systems and reusable spray bottles, thus reducing container disposal and shipping.

**E. Facilities:**

- The Ward Building (Facilities Services) was built to the LEED Silver standard
- Large renovation projects are completed to meet the LEED Silver standard.
- The College completed a stream restoration project on campus with partial funding from a Pennsylvania Growing Greener grant that reduces erosion and prevents flooding. The College created a storm water management pond, also partially funded by a Pennsylvania Growing Greener grant, and several underground storm water retention/groundwater recharge systems throughout campus. The storm water retention pond won a national award for its design and is included in tours of best-management practices by civil and environmental engineering programs. In addition to effective storm runoff control, ongoing analyses by Chemistry and Geology faculty and students have shown that the pond’s design results in improved water quality downstream of the pond.

## TEACHING AND LEARNING

Bryn Mawr College strives to educate students about their roles in the global citizenry. The College aspires to instill habits-of-mind necessary to face contemporary challenges and emerging perspectives, to offer opportunities to prepare for professional pursuits in fields relating to environmental sustainability, and to encourage the adoption of an informed, life-long disposition for environmental stewardship.

Curricular and co-curricular efforts at Bryn Mawr College aim to provide rigorous academic inquiry into environmental sustainability accompanied by relevant service learning; opportunities for guided scholarly research; practical co-curricular activities pertaining to environmental literacy; meaningful civic engagements; and venues for campus action as described below.

### **A. The College will strengthen connections between the its curricular philosophies and the principles of environmental stewardship.**

Two of the College's seven goals for a Bryn Mawr education are 1) the preparation of Bryn Mawr students to be active citizens in an increasingly global context, one in which the opportunities to overcome geographical and cultural boundaries are greater than at any other time in history; and 2) the education of undergraduate women who are prepared to transform and improve lives in their own communities and throughout the world.

- Continue to connect the institution's curricular philosophies with principles of environmental sustainability by offering courses and a Concentration for students to pursue serious academic study on environmental stewardship and sustainability.

### **B. The College will expand Bi-College course offerings in Environmental Studies.**

Bryn Mawr College and Haverford College enjoy a special consortial relationship that enables their students to live, study, and/or even major at the neighboring school. Both institutions offer many academic disciplines. Many academic departments conduct curricular planning together. Bryn Mawr College has an Environmental Studies program. Haverford College currently does not.

- Use the resources from recent grant from The Andrew W. Mellon Foundation to engage Bryn Mawr and Haverford faculty and students in a planning process to develop an enhanced and broadened Bryn Mawr-Haverford Program in Environmental Studies.

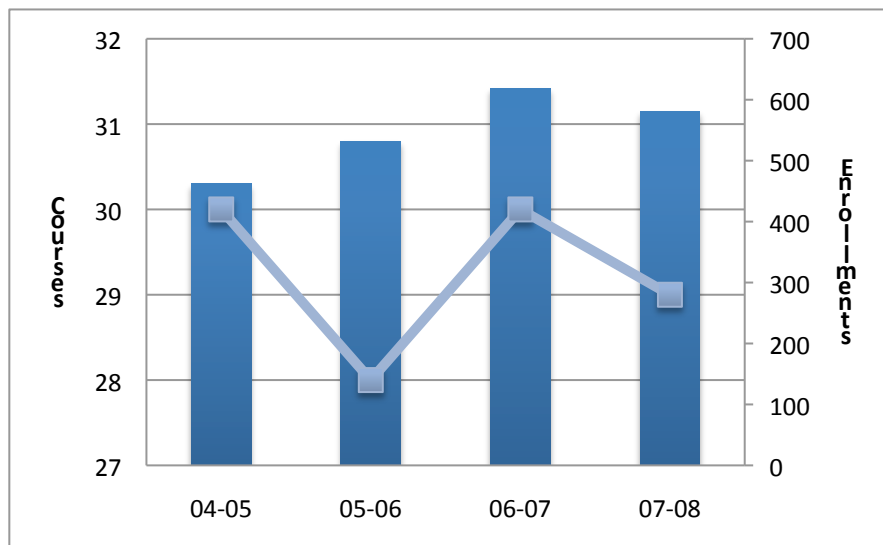


Figure 1 Enrollments in Environment Studies courses continue to trend upward even in academic years where there are fewer courses. (Enrollment shown as bars; number of courses shown as squares.)

### **C. The College will expand Environmental Studies course offerings across disciplines.**

Bryn Mawr College believes that central to the mission of a liberal arts experience is providing a variety of approaches to inquiry. Further, a liberal arts education is more than a strong training in one discipline.

Established in 1995, Bryn Mawr College's interdisciplinary Concentration in Environmental Studies offers to Bryn Mawr and Haverford College students the equivalent of a minor.

Bryn Mawr College's interdisciplinary Concentration in Environmental Studies started as collaboration among the departments of Biology, Geology and Anthropology. Today, eight departments from all three academic divisions offer courses in the Concentration.

- Increase the number of Environmental Studies courses across the academic divisions, particularly in the humanities and social sciences, to make the Concentration accessible and to make the individual courses relevant to students of all academic interests.

- Use the resources from The Andrew W. Mellon Foundation grant to offer 14 curriculum development grants to faculty who wish to develop new courses that would count towards both the Environmental Studies concentration and the major in their home departments.

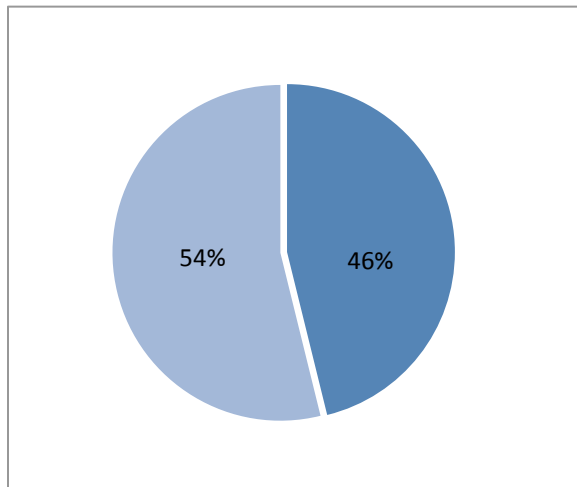


Figure 2 More than half of departments have Faculty doing academic work on environmental sustainability

### **D. Faculty affiliated with Environmental Studies will explore offering Emily Balch Seminars on the environment.**

The Emily Balch Seminars are cross-disciplinary courses required of first-year students. Through intensive reading, writing, and discussion, the Emily Balch Seminars challenge students to think about complex, wide-ranging issues from a variety of perspectives. A key learning outcome of the Seminars is to develop in students a critical, probing, thoughtful approach to the world and their respective roles in it.

The Environmental Studies Steering Committee should engage affiliated departments to offer regularly an Emily Balch Seminar on an interdisciplinary topic related to environmental sustainability.

### E. The College will strengthen the interdisciplinarity of the faculty.

The Environmental Studies Program is one of the few named programs at Bryn Mawr College. Called the Johanna Alderfer Harris Environmental Studies Program, it was endowed by an alumna benefactor. The Program's endowment supports two tenure-track positions and two named professorships.

- To strengthen the continuity of course offerings, the College should continue to increase the number of continuing faculty positions affiliated with the Environmental Studies program. The College may explore curricular affinities among departments by hiring two two-year visiting appointments in Sociology and Philosophy funded The Andrew W. Mellon Foundation grant. When vacancies arise due to retirements, these departments are encouraged to request from the Committee on Academic Priorities that these vacant tenure-track positions be filled with faculty with cross-disciplinary expertise that contributes to the Environmental Studies program.

Bryn Mawr College is pleased to welcome Dr. Ruth Simpson as a Visiting Professor for 2009-2010, thanks to funding from an Andrew W. Mellon Foundation Environmental Studies grant.

Simpson's research focuses on intersections of medicine, the environment, science, culture, and the development of the concept of "modernity." Recently she has explored the parallels between late nineteenth-century social theory and the concurrent debates over the origins of epidemic disease. She finds that during this period more communal understandings of epidemics as environmentally-caused gave way to the more individualistic explanation of germ theory.

As a post-doctoral fellow at Brown University, she studied the processes through which communities discover and take action on toxic contamination and the methodological and ethical issues of using community-based participatory research to study local environmental action. Simpson has written on environmental justice, problems of risk perception, phobias, and historical narrative, and has published and contributed to articles in *Sociological Forum*, *The Handbook of Medical Sociology* and the forthcoming *Contested Illnesses* (Brown, Morello-Frosch, Zavestoski, eds.). She has begun a project that explores resistance to the use of public transportation, as well as a separate project that explores the attribution, in popular science, of large consequences (i.e., epidemics, nuclear explosions) to tiny causes (i.e., germs, atoms).

### F. The College will increase institutional capacity for experiential, service learning available for academic credit.

The Bryn Mawr College Praxis Program, an experiential, community-based learning program, is a national model. The premise is that social responsibility and "real world" preparedness are achieved through a combination of classroom-based theory with practical experience. Therefore, a Praxis course integrates intensive academic study with rigorous, relevant fieldwork. There are three levels of Praxis course work.

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Praxis I and II courses use fieldwork as a form of experiential learning to enrich the study and understanding of the topic. In 2008-2009, 69 students enrolled in Praxis I and II Environmental Studies courses; they engaged with community-based organizations as diverse as the Heinz Wildlife Refuge and YouthBuild Charter School.

A Praxis III course is an independent study with a faculty member for which fieldwork is the center. Fifteen students have developed Praxis III courses related to environmental sustainability and have worked with a range of community-based organizations including the Academy of Natural Sciences, City of Philadelphia Planning Commission, Clinton Climate Initiative, Pennsylvania Horticultural Society, and Women's International League for Peace and Freedom.

- Use the resources from The Andrew W. Mellon Foundation grant to increase the number of and institutional capacity for Praxis I courses that count toward the Environmental Studies Concentration by hiring a half-time Environmental Studies Field Placement Coordinator to coordinate the logistics of the field work. To encourage more courses, the College may defray the costs of non-traditional expenses associated with Praxis courses.
- Increase the number of students exposed to environmental sustainability through Praxis III courses. In addition, increase awareness among students and faculty that Praxis III courses may be taken as part of the Environmental Studies senior experience.

### **G. The College will encourage Study Abroad and Exchange Programs as ways to enrich learning experiences.**

Bryn Mawr College values the role of study-abroad and exchange-study experiences as part of a global education. These experiences present immediate benefits to academic life by broadening perspectives, growing self-confidence, and enhancing worldviews. Study abroad experiences also enhance career choices by illuminating different career paths and making students more attractive job applicants because of their international experiences.

In recent years, more than 40% of graduates participated in a study abroad or exchange experience.

- Students are interested in enriching their academic study of environmental issues by way of study-abroad programs with Environmental Studies foci. The Environmental Studies Steering Committee will work with the Office of International Programs to research and expand the list of approved Study Abroad and Exchange programs with environmental studies coursework.

**H. Students will explore opportunities for not-for-credit environmental literacy experiences.**

A student group, the Bryn Mawr College (BMC) Greens is dedicated to promoting environmental awareness and activism on campus and in surrounding communities. The BMC Greens organizes “Greens 101” educational workshops that are open to the campus community.

Bryn Mawr College offers a co-curricular Wellness Program administered by the Athletics and Physical Education Department. The Program’s varied curriculum provides opportunities for students to develop lifelong habits that will enhance their quality of life. Through the Wellness Program, the College currently offers a Financial Literacy course.

- Consider expanding upon the BMC Greens educational-workshop model. Explore the idea of designing a course on Environmental Sustainability or another type of intentional co-curricular experience that would enable students to learn how their personal choices influence the environment and to explore accessible, viable alternatives to conventional practices. Through these opportunities, students will also discover the challenges they will likely encounter due to both the effects of climate change and the diminishing availability of inexpensive fossil fuels.

**I. The Career Development Office will increase awareness among students about the possibilities for meaningful careers in environmental sustainability.**

The Career Development Office and academic departments often work together to increase awareness about career paths and choices. In fall 2008, the CDO and the Environmental Studies Program co-sponsored an alumnae panel called “Working toward Sustainability”. The panel featured alumnae who majored in humanities; social sciences; and natural and life sciences disciplines who are today’s leaders of environmental sustainability.

- More than 100 Bryn Mawr College alums self-describe being professionally engaged in a field pertaining to the environment. The College should engage interested alums in networking and career development opportunities for students and recent graduates.

## RESEARCH

### **A. The College will encourage undergraduate participation in scientific research on topics related to environmental sustainability.**

Bryn Mawr College is revising its current general education requirements to include a distribution of courses across five modes of inquiry. One of the five modes, scientific investigation emphasizes problem solving and exploratory experiences. It teaches students to employ systematic exploration of research questions involving the empirical world.

- To encourage undergraduate participation in scientific research on the environment, the College can bolster the number of research fellowships for students coordinated via the Dean's Office fellowships clearinghouse; seek to increase the funding opportunities for undergraduate research in sustainability science; and profile accomplishments of students who have conducted research on environmental science and sustainability.

### **B. The Dean's Office and Environmental Studies Program will increase awareness of the College's fellowships and Green Grants for summer opportunities to engage in in-depth work on environmental sustainability.**

The College offers on a competitive basis summer funding to students proposing to conduct internships with sponsoring organizations on issues related to the environment. Funding opportunities include the Environmental Studies Green Grants; the Alumnae Regional Scholar Fellowship and the Howard Hughes Medical Institute Science Horizons Fellowship. In summer 2009, eight students participated in environmental studies fellowships around the world.

- A requirement for some College fellowships is a presentation on the learning experience and the new knowledge. Student presentations or workshops should be encouraged for all students participating in summer fellowships, especially those fellowships on environmental sustainability. The BMC Greens may also explore using the summer fellowship recipients as presenters at the Greens 101 workshops.

**C. The College will increase awareness of faculty research and scholarship on the environment.**

Many Bryn Mawr College faculty members across the disciplines are involved in leading-edge research and scholarship on the environment and sustainability in such areas as energy, economic development, global climate change, food studies, urban development, and recycling.

- The College should increase awareness of faculty research on the environment and environmental sustainability through profiles in College publications such as *Science and Technology* and the *Alumnae Bulletin* and media outlets such as “Bryn Mawr Now” and the institution’s home page.

**D. The College will promote research that integrates pedagogy with professional development on topics related to environmental science for K-12 teachers.**

Bryn Mawr College faculty members in the Natural Sciences partner regularly with faculty in the Social Sciences to promote teaching and learning opportunities for K-12 teachers who work in Bryn Mawr College’s host communities. These partnerships span divisions within the College and span institutions of higher education located in the mid-Atlantic region. Often funded by external grants, these professional-development programs include summer teacher institutes.

Professor Victor Donnay is a co-principal investigator on a multiple institution National Science Foundation grant to create a coherent, innovative, content-rich multi-year curriculum in environment, energy, and sustainability science for an institute that will offer a newly developed teacher-education master’s degree. The degree will prepare teachers to link STEM learning in K-12 classrooms with hands-on engagement on environmental issues in their schools and society.

Associate Professor of Growth and Structure of Cities and Environmental Studies Ellen Stroud was appointed a 2009 Fellow of the National Humanities Center in North Carolina. While a visiting fellow during the 2009-2010 academic year, Stroud will pursue a book project titled *Dead as Dirt: An Environmental History of the Dead Body*.

Stroud’s proposed monograph, *Dead as Dirt*, represents a fresh and unusual approach to understanding the relationship between humans and their environments, by examining the human body as “as a literal, chemical and biological component of the natural world, with a complex environmental history of its own.”

Stroud found that investigating the material histories of human bodies revealed new connections “between human bodies and histories of technology, property, politics, and thought.” Her current project expands the scope of inquiry to the 20th-century United States; the “human nature of the subject matter” also introduces new perspectives on the interactions between environmental history and social, political, and intellectual histories.

- As outside funding permits, seek additional opportunities to strengthen relationships between faculty and K-12 teachers to enrich mutual professional-development interests and opportunities.

### **E. Students are encouraged to explore sustainability issues through the College's Teaching and Learning Initiative.**

Bryn Mawr College has a model program called the Teaching and Learning Initiative (TLI). Funded by The Andrew W. Mellon Foundation, the Institute's underlying philosophy is to create shared opportunities that move beyond the limitations of traditional roles of faculty, staff and students. Called the Staff-Student Partnerships, one aspect of the Initiative connects students with administrative, clerical, and service/craft staff members. This connection affords staff the chance to interact with students as teachers of the professional or life skills they practice daily.

- The College will continue to pair students with staff members in the College's administrative departments to create hands-on learning opportunities regarding the practical aspects of environmental sustainability for administrators of a residential, college campus. Over time, explore the connections between the Staff-Student Partnerships and the curriculum for the Environmental Literacy course.

### **F. The College will foster student research projects that study energy efficiency of the Bryn Mawr campus.**

The Bryn Mawr College campus is a living research laboratory for student research projects on energy efficiency in the operations of a residential college campus. The College's Chief Financial Officer and Chief Administrative Officer seek to enhance the student learning experiences by providing mentorship on projects that aim to contribute to campus energy efficiency and conservation.

- To encourage student projects that study ways to increase campus energy efficiency and/or conservation, the Treasurer's Office will develop a mini-grant program to fund student research projects that aim to generate demonstrable energy savings for the College and will fund two Summer Science Research internships for students working with Bryn Mawr faculty wishing to study methods for energy savings.

## COMMUNITY OUTREACH AND ENGAGEMENT

Bryn Mawr College is an institution within a vibrant community and metropolitan region. The College and campus community embrace a strong civic mission. The College created an Office of Civic Engagement to bridge the academic and civic missions of the College.

For the benefit of its host communities and the world, the College strives to empower students to be authentically engaged citizens on campus, off campus, and throughout the world. Through the Office of Civic Engagement, students participate in established partnerships between the College and local communities and community organizations. These partnerships are designed to be sustainable and have with intentional emphases on reciprocity and transparency.

### **A. The College will enrich student experiences through community-based activities that explore environmental issues and sustainability efforts.**

Bryn Mawr College students currently have opportunities to explore environmental issues and sustainability efforts locally, nationally and internationally through college-sponsored service activities and externships.

Students regularly volunteer and intern with several local environmental organizations with which the College has on-going partnerships: Energy Vision; Maysie's Farm; Pennsylvania Horticultural Society's "Philadelphia Green" program; White Dog Café Foundation (which houses the Fair Food program and the Sustainable Business Network); and YouthBuild Charter School. This summer, the college is sponsoring its first international service trip for students and alumnae, who will have the opportunity to travel to Costa Rica with Earthwatch and participate in research on sustainable coffee farming.

The Bi-College Career Development Office's externship program offers students a chance to shadow Bryn Mawr and Haverford College

Emily McGlynn conducted a Praxis III class at Energy Vision (EV), a national nonprofit organization that researches, analyzes and promotes pathways to pollution-free renewable energy sources, especially focusing on phasing out the use of petroleum in transportation.

Emily knew she "wanted to take on a significant project to continue the process of integrating compressed natural gas (CNG) refuse trucks into waste-hauling fleets".

She spent her spring semester researching the scope of the City of Philadelphia refuse fleet and its emissions, ways the city might benefit from natural gas garbage trucks, and options for funding and organizing such a program.

According to Emily, "the most valuable thing I learned during my work with Energy Vision (EV) was a very personal realization. I found that I am able to accomplish things that initially seem utterly impossible." She went on to say, "it is certainly not the end of the road. If there is one thing I've learned from my involvement with Energy Vision, it's that the road never ends. There is always a next step, and it's my job as an activist to find it and push forward, both inside and outside the classroom."

alumni in a range of careers during their January breaks. Many of these alumni, located throughout the world, work on environmental issues in various capacities.

Develop new partnerships that will allow students to volunteer in areas of environmental sustainability not addressed by any of our current partner organizations (e.g., recycling). Increase awareness among students, staff and faculty about these opportunities for service.

Recruit additional alumni working on issues of environmental sustainability to host student externs. Increase publicity of these opportunities to students.

**B. The College will provide campus-community opportunities for charitable service with an environmental sustainability focus.**

The Office of Civic Engagement organizes several drives that collect items that might otherwise be discarded, such as school supplies, clothing, winter coats and accessories, and Halloween costumes. These items are distributed to human services organizations in the greater Philadelphia area. With the assistance of the Student Activities Office, various student groups organize drives, such as used book drives for underprivileged populations.

To reduce campus waste and encourage recycling, the Bryn Mawr College Staff Association collects, sorts, and organizes all discarded items from campus dormitory room and sells them at an annual Flea Market where all items are 25 cents. All unsold items are donated to local charitable organizations. The proceeds of this sale are used to underwrite the Staff Association's Newbury Award, which recognizes a staff member who embodies the principles of the College's Green Plan.

- Continue the College's long-standing tradition of service enlightened by environmental stewardship.

## COMMUNICATION

The College belongs to many associations and consortia that have great interest in sustainability. These include our academic programs with Haverford and Swarthmore Colleges; the Shared Services Consortium, consisting of six liberal arts colleges in Pennsylvania; the Association of Independent Colleges and Universities of Pennsylvania (AICUP); the National Association of College and University Business Officers (NACUBO); the Campus Safety, Health, and Environmental Management Association (CSHEMA); and the Association of Higher Education Facilities Officers (APPA). The College will work with these groups and with other colleges and universities with which it regularly interacts to enhance and develop effective communication practices to increase awareness of environmental issues and provide educational materials for the general public.

In addition, Bryn Mawr will:

- Publicly recognize those activities by our faculty, staff, and students that are consistent with the College's Green Plan and Climate Action Plan.
- Consider expanding upon the Staff Association's Newbury Award to also recognize a student or a student group whose efforts have exemplified dedication and initiative in pursuing the College's environmental and sustainability goals.
- Develop and maintain a webpage that informs the community of Bryn Mawr's sustainability efforts and progress and that educates its readers about individual practices which can reduce their carbon footprint.

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### **Bryn Mawr College Administration**

Nancy Vickers, President Emeritus  
Jane Dammen McAuliffe, President  
Kim Cassidy, Provost  
John Griffith, Chief Financial Officer  
Ruth Lindeborg, Secretary of the College

### **Sustainability Steering Committee**

Jerry Berenson, Co-Chair, Chief Administrative Officer  
Elizabeth Shepard-Rabadan, Co-Chair, Assistant Provost for Administration  
Donald Abramowitz, Environmental Health and Safety Officer  
Don Barber, Associate Professor of Geology, Director of Environmental Studies  
and Harold Alderfer Chair in Environmental Studies  
Melanie Bowman '12, Bryn Mawr College Greens  
Yong Jung Cho '12, Bryn Mawr College Greens  
Victor Donnay, Professor of Mathematics  
Steve Green, Director of Transportation  
Jim McGaffin, Engineer, Transportation Services  
Ann Ogle, Secretary in the Psychology and Education Departments  
Catherine Shapiro, Chief of Staff, Office of the President  
Glenn Smith, Director of Facilities Services  
Kate Thomas, Associate Professor of English  
Michelle Walhagen, Sustainability Coordinator  
Nathan Wright, Assistant Professor of Sociology  
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### **Provost's Office Research Interns**

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