**Albion College Climate Action Plan**

Albion College President Peter Mitchell signed the Presidents Climate Commitment in the spring of 2007, and this commitment has since been endorsed by President Donna Randall, the Albion College Sustainability Council, and the Albion College Board of Trustees. This narrative summarizes the present level of emissions, explains how the College formulated its plan to meet the climate commitment, presents the plan as approved by the trustees of the College, describes some of our immediate steps toward our goal, and describes the educational efforts we undertake in parallel with these steps.

**Present Level of Albion College Greenhouse Gas Emissions.**

A greenhouse gas inventory for Albion College was completed in the year 2008-2009 by undergraduate student and National Wildlife Federation Intern Erica Tauzer, supervised by Dr Tim Lincoln, Director of the College's Institute for the Study of the Environment (renamed Center for Sustainability and the Environment, CSE, in 2009), and Dr Troy VanAken, then Executive Vice President of the College. Erica gathered data for the years 2001-2007, and used the Clean Air/Cool Planet carbon calculator to compile and analyze the data. The following discussion is based on these data. Students are presently working on updating this inventory.

The 2001-2007 period of time saw significant changes in the College's demographics. Most notable of these were a peaking of enrollments in 2005-6 and the bringing on line of a new, LEED-silver certified science complex in 2004-6.

A major benefit of using the Clean Air/ Cool Planet carbon calculator is its ability to assimilate data on a variety of greenhouse gas sources and present them in the common units of $CO_2$ equivalents ($eCO_2$). This allows the relative importance of all gas emissions to be readily assessed. The College's total emissions in 2007 were 24,465 MT $eCo_2$. A breakdown of Albion's emissions by sector is shown below, figure 1.

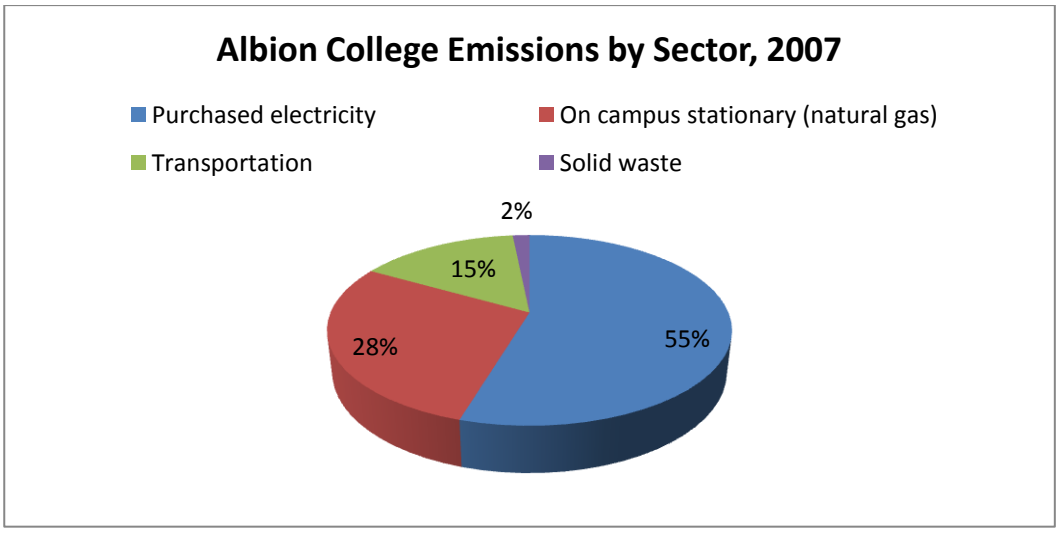



*Figure 1. Albion College's Greenhouse gas emissions by sector, 2007*

This graph clearly shows that purchased electricity is that largest single contributor to the College's emissions profile, and that electricity and natural gas together constitute over 80% of the College's emissions.

The total greenhouse gas emissions of the College rose during the 2001-2007 period as shown in figure 2.

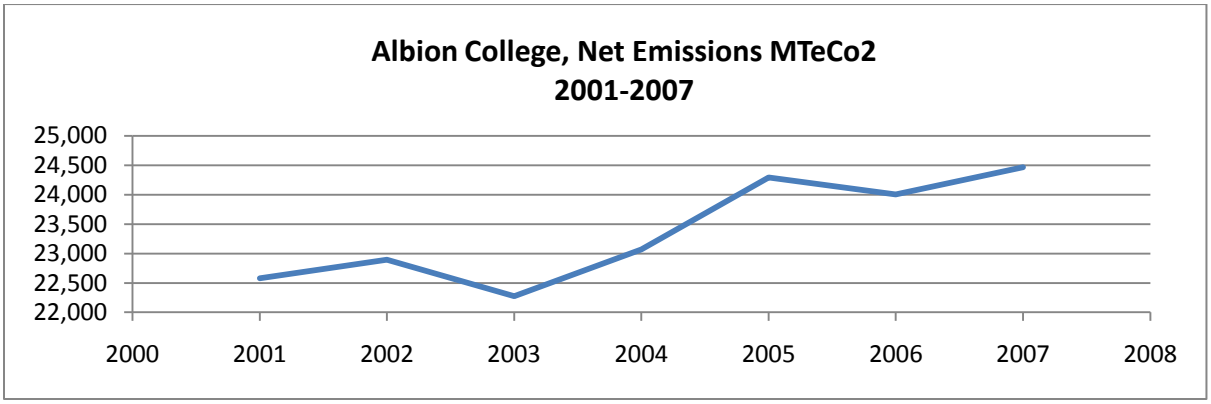



*Figure 2. Albion College's greenhouse gas emissions over the period 2001-2007*

This increase was due to a sharp increase in enrollment in the years 2001-2004 (figure 3). The growth in enrollment was accompanied by a growth in the physical plant, most notably an LEED-certified 149,200-square- foot science center project of new and renovated space, which was phased in in the years 2004-2006.

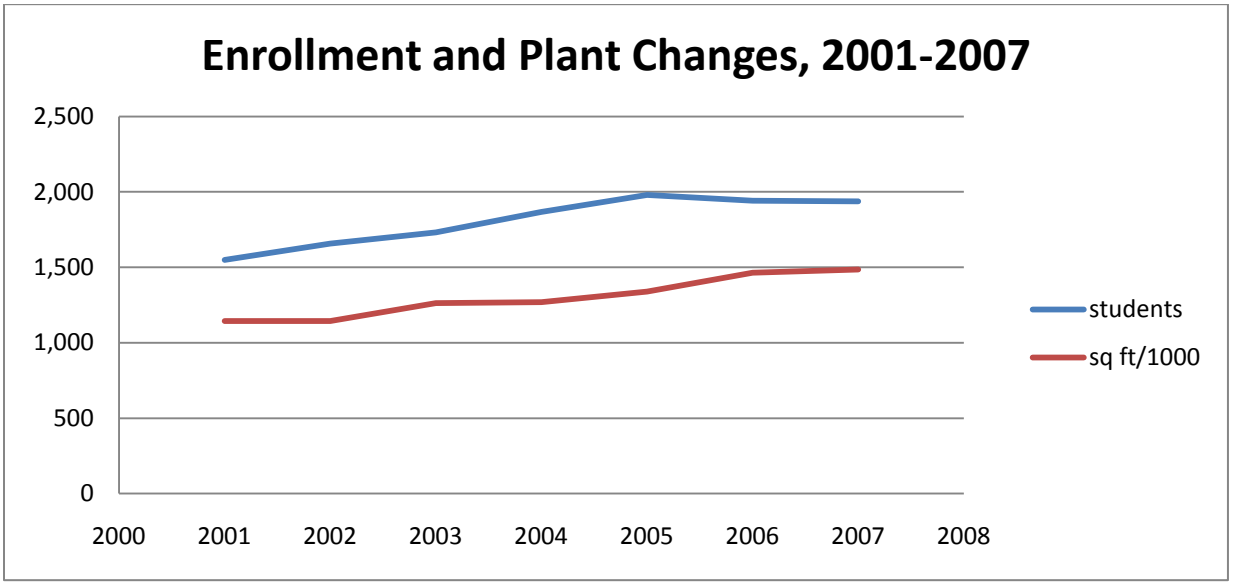
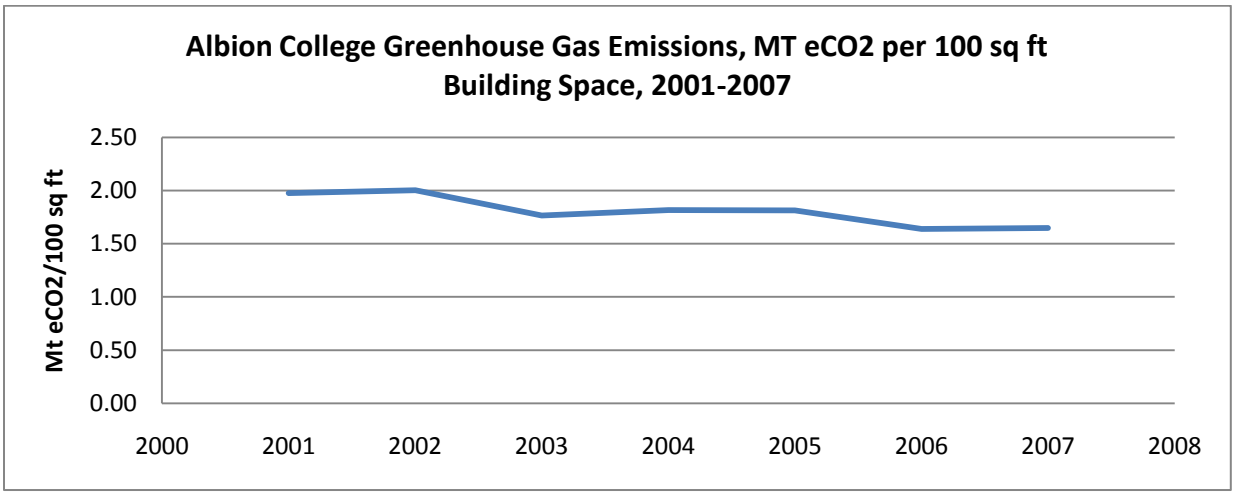
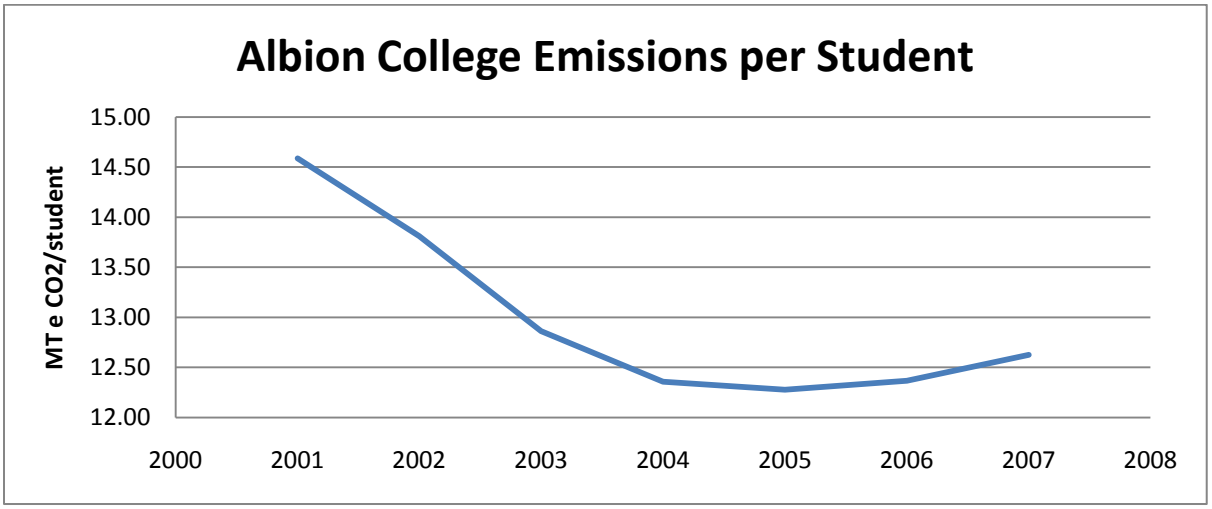


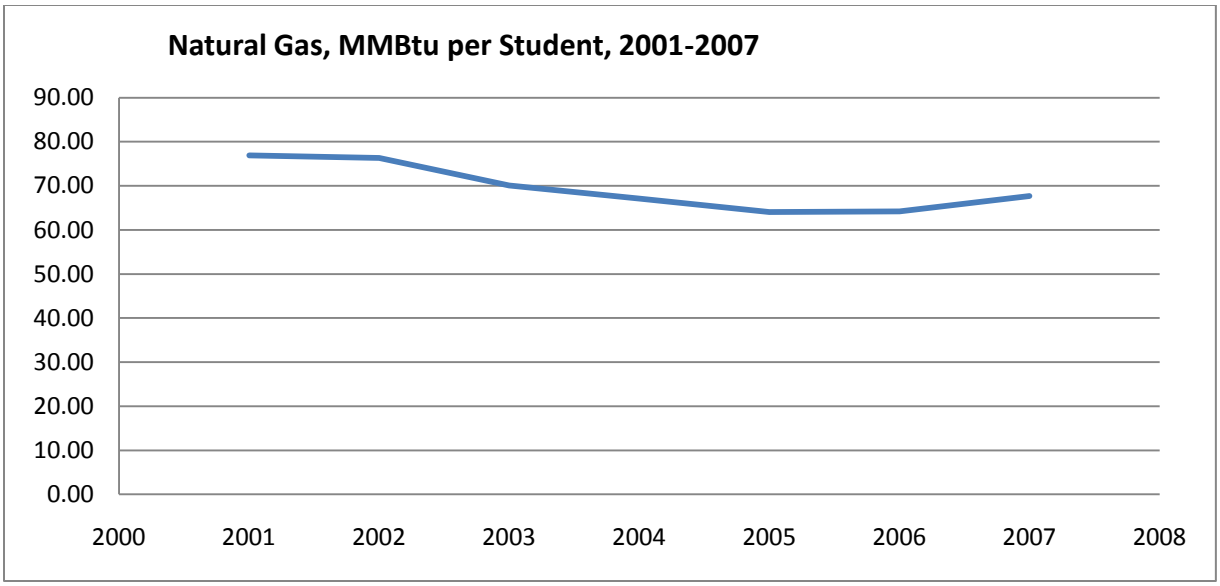

*Figure 3, Changes in Albion College enrollment and total building space, 2001-2007*

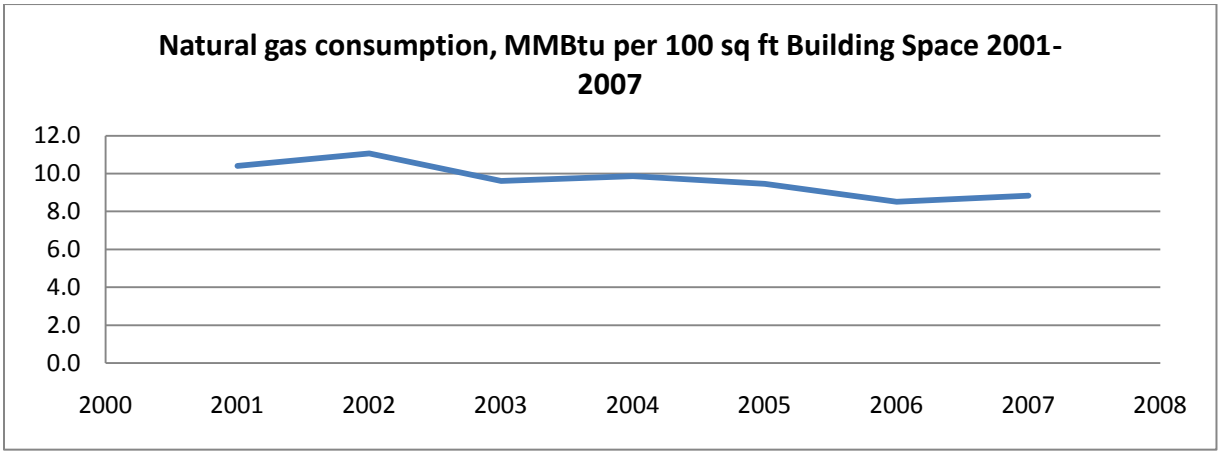
In these years and the following, the College has engaged in a variety of retrofits and efficiency upgrades across campus, including decommissioning of the highly inefficient Epworth Building, installing high efficiency lighting in the Dow Recreational and Wellness Center, consistent purchase of Energy Star appliances, and most recently (2009) taking off-line the highly inefficient International House Dormitory. The end result is that we have succeeded in decreasing the emissions both per square foot of physical plant space and per student in the 2001-2007 time interval (figures 4&5)

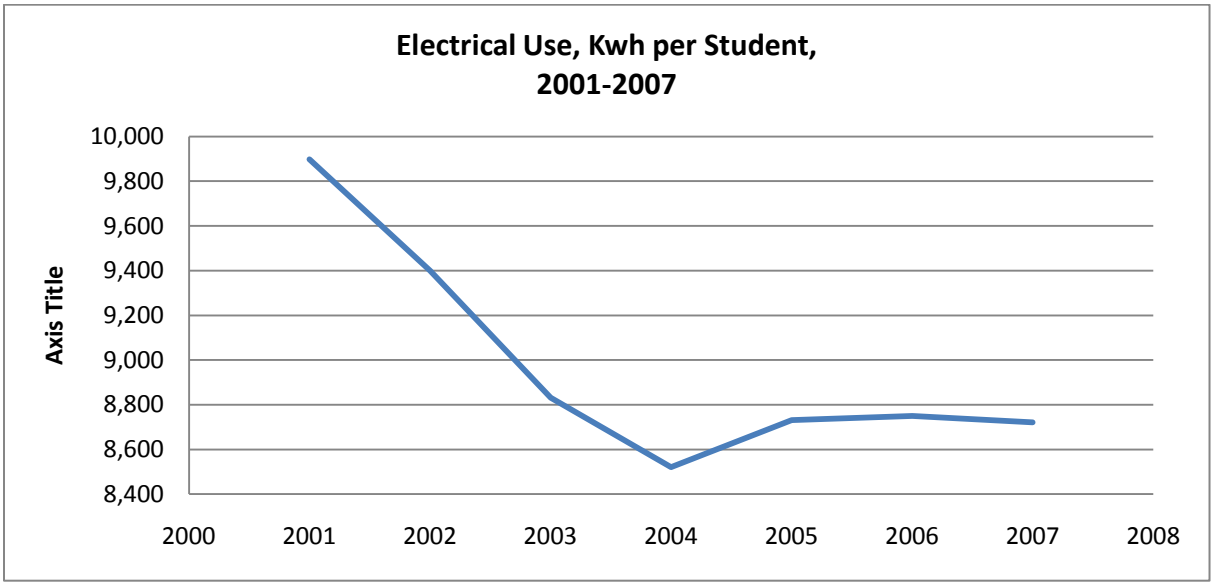


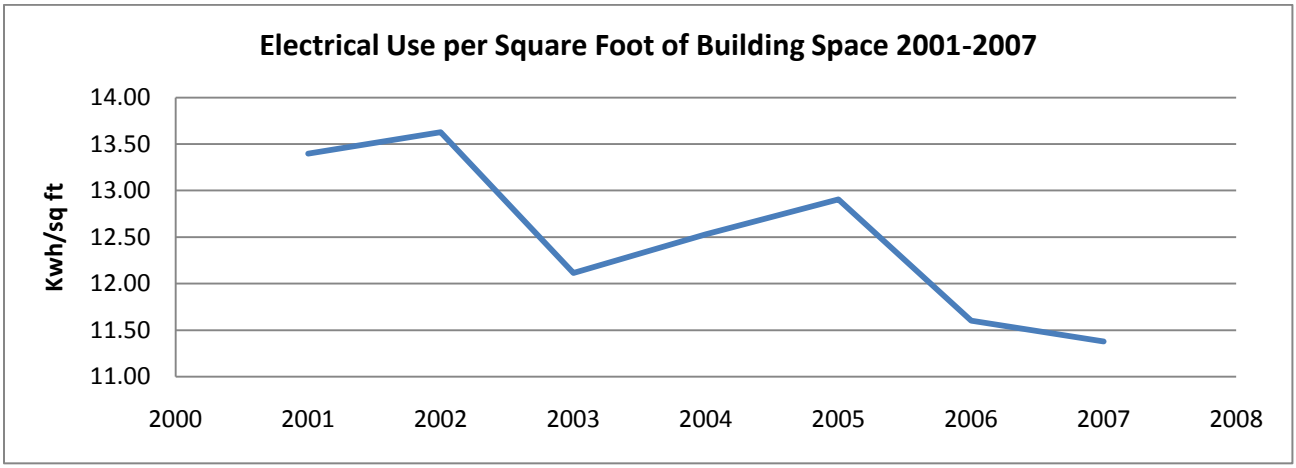




These savings result from more efficient use of both natural gas and electrical power, as shown in figures 6 and 7. Note that the 2004-2006 upswing in electrical use is due to the bringing on line of the new science complex.


Natural Gas, MMBtu per Student, 2001-2007
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008


Natural gas consumption, MMBtu per 100 sq ft Building Space 2001-2007
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2000
2001
2002
2003
2004
2005
2006
2007
2008


Electrical Use, Kwh per Student, 2001-2007
Axis Title
10,000
9,800
9,600
9,400
9,200
9,000
8,800
8,600
8,400
2000
2001
2002
2003
2004
2005
2006
2007
2008




## Formulating the Path to Carbon Neutrality

The carbon action plan detailed below was written by a group of students, staff and faculty convened by Dr. Michael Frandsen, the College's Vice President for Finance and Administration. This group consolidated data and ideas gathered from several sources throughout the previous year. In this year, the College became a member of AASHE. Two students, Erica Tauzer and Lisa Anderson, applied for and were awarded National Wildlife Federation Internships, co-funded by the College's Institute for the Study of the Environment (EI, now called CSE). These students worked with then Executive Vice President, Troy VanAken and EI (CSE) Director Tim Lincoln to organize a student-led Sustainability Council of students, faculty and staff which held meetings open to all members of the College in the academic year 2008-9. As a class project, environmental economics students investigated costs and carbon savings for a variety of specific options. Mark Frever (Facilities) and Tim Lincoln (EI) attended the AASHE Chicago Carbon Action Summit in August, 2009. The group responsible for the plan below consisted of representatives from all of these initiatives. This statement below was endorsed by the Albion College Board of Trustees Infrastructure Committee, October 22, 2009.

***Albion College's Commitment to Carbon Neutrality:***

As a signatory to the American College and University Presidents' Climate Commitment, Albion College is committed to pursuing carbon neutrality in ways that are consistent with our mission and our institutional sustainability. The focal points of our commitment are learning - inside and outside the classroom, on and off campus, by all stakeholders in "one college" - and the translation of critical thought to action. Our commitment is shared by the students, faculty and staff of Albion College and by our Board of Trustees. We recognize our obligation to contribute to the support of a stable climate. As we pursue carbon neutrality we will be guided by these values:

- Student involvement in and the educational value of our efforts

- Development of living and working habits among students, faculty, staff, and others transcending the boundaries of our campus and driving long-term behavior change where necessary.
- Experimentation and learning by doing.
- Proactive leadership.
- Collection of data and its use in decision making.

In our operations we will:

- Utilize the best available, appropriate technologies to reduce greenhouse gas emissions as we build, renovate, and replace.
- Adopt LEED (and future generation) principles for all projects to which they apply.
- Purchase products that have been certified by ENERGY STAR, EPEAT, and other like bodies when available.
- Take pride in our accomplishments and make our results visible both on campus and off.
- Apply the Pareto principle to address the greatest sources of greenhouse gas emissions.
- Always look for ways to reduce, reuse, and recycle.
- Work to develop partnerships for sustainable, local sources of supplies and services.
- Complete a biannual inventory of our greenhouse gas emissions.
- Emphasize local efforts as we consider opportunities to offset emissions.

In doing these things, we hope to achieve carbon neutrality and meet the Presidents' Climate Commitment no later than our 200th anniversary in 2035.

## Immediate Steps

These principles strengthened practices that the College already followed. In the time since the College signed the commitment the following actions have been taken:

Facilities:

- Three residence halls have been refitted with thermal pane windows to maximize energy efficiency.
- All residence halls are now fully equipped with energy-efficient washers and dryers.
- During academic break periods, buildings are closed, equipment shut down, and temperatures lowered to reduce energy consumption.
- Boilers in the central plant have been replaced with more efficient Cleaver Brooks boilers, complete with digital control and monitoring systems.
- A project has begun to install VFDs (variable frequency drives) on major pumps and air-handling units.
- The College has begun an upgrade of lighting. The plan has a 2.5 year pay back that has a 867,728 KWh savings. This translates into a reduction of carbon emissions by 650.79 tons. The first stages of this plan include the Dow Center field house, Kresge Gymnasium, Whitehouse Hall

(student rooms, hallways and common spaces), Robinson (offices and common spaces) and all six fraternities (common areas). For example, in the Dow Center, 150 lights were replaced by 100 florescent lights, using two thirds the energy while emitting almost double the amount of light.

Grounds:

- Established 25 outdoor recycling locations with weekly pickup. The College's recycling program is in conjunction with the City's. This makes recycling possible for both the City and the College.
- The College extensively recycled materials from the two buildings that were demolished, reusing some of the stone, recycling clay roofing tiles, and offering salvaged materials to Habitat for Humanity and other members of the community.
- Grounds department uses NatureSafe, a natural and organic fertilizer.
- In October 2009, Albion College received certifications from the Michigan Turfgrass Environmental Stewardship Program (MTESP) and the Michigan Agriculture Environmental Assurance Program (MAEAP). Albion College is the first higher education institution in Michigan to earn these state certifications.

Dining Services:

- The College dining hall has initiated a trayless campaign to reduce food waste. A monitored trial indicated reduced waste by .3 pounds per person, per meal. Presently, about 40% of users opt for trayless dining. Based on the total numbers of meals served in the 07-08 academic year, the amount of food and beverage waste saved is estimated at 35,759 pounds.
- Dining Services switched to 100% recycled napkins. Recycled napkins cost the same, but students are using less due to the new efficient napkin dispensers.

Instructional Technology:

- Use of instructional courseweb software allows classes to go paperless.
- Replacement of CRT monitors with flat panel screens using less power.
- Setting all campus computers to power down after 2 hours of inactivity.
- Introduction of virtualized servers during the summer of 2008, now powering around 20 smaller servers and hardware, decreasing the power draw by one-third, from approximately 13,000 watts down to around 7,800-7,900 watts.

## Carbon Neutrality as Education

### *Background*

Albion College is committed to the principle that education is an integral part of our carbon action plan. Education is our central role, and the people we touch are our true legacy. The examples we set with

our actions, and the lifelong habits we help ingrain in our students and extended community have the potential to vastly outweigh the physical consequences of our carbon reductions.

Having said that, constructing a comprehensive educational plan is not a simple task. The College curriculum is controlled by the faculty, who staunchly protect the teaching of the liberal arts defined as the fundamental principles of the collective and individual disciplines of the College departments. While not antithetical to discussion of climate change, many faculty members are leery of politicizing the curriculum or of privileging one important issue over others they see as equally or more important. Even for those who embrace our efforts, using our climate actions as education requires new ways of teaching. Concurrently, our administration and plant staff previously managed our facilities with the goals of maintaining an efficient and physically attractive campus, minimizing student and faculty complaints, and otherwise remaining in the background. It is within this context that our educational efforts are moving forward.

We were not without assets with which to address these issues. A number of highly creative administrators and key staff members, especially in plant, grounds and dinning services, are open to working on a comprehensive plan. Our faculty clearly see our role as educating for citizenship, and our core curriculum includes gender, ethnicity, environmental and global "category" requirements, courses which facilitate discussion of important issues of our times. Eleven years ago, the College created an Environmental Institute (last year renamed the Center for Sustainability and the Environment). This has attracted a core group of students who have driven much of our climate actions and led a core group of faculty to re-orient their teaching and research efforts to serve these students. Finally, development of our action plan was roughly coincident in time with our most recent round of strategic planning, undertaken with the inauguration of President Donna Randall. This allowed key elements to be imbedded into the College's strategic plan.

Fundamental to our climate-education plan is the simple but transformative idea that we are "one College", that all of our actions, from housekeeping to course instruction have the potential to serve our educational mission. This idea grew from discussions of sustainability education accompanying our carbon action planning, and has been adopted by the College as a general concept, employed more widely. The most notable application of this principle to date has been the implementation of College-wide themed years, described below.

### *Specific Educational Efforts*

For reasons outlined above, Albion's carbon-neutrality education occurs as part (but a central part) of more broadly defined sustainability education. This occurs at several levels, and in numerous contexts at the College.

All students must take an environmental category course as part of their general education graduation requirement. To be included in this category, courses must substantially enhance students' understanding of the earth's environment; deal substantially with the consequences of human intervention into natural systems, and lead students to view the relationship among elements of

environmental systems from an interdisciplinary perspective. Courses from all divisions have been developed to meet this requirement; many deal significantly with climate change.

As a key element in the College's strategic plan, the College has adopted a program of "themed years". On a three year rotation, themes will be sustainability, wellness, and global diversity. During each year, we will focus existing programs, such as endowment-supported speakers, on the theme while developing new initiatives and events to provide a year long, interdisciplinary exploration of the theme for the entire college community. Instructors will be encouraged to relate courses to the theme, and a variety of co-curricular events will be scheduled in support of the theme. All parts of the college are encouraged to support the themes in a manifestation of the One College concept. The year 2010-11 will inaugurate the program, with the theme of sustainability.

Several planned programs in the themed year will further our climate education. A week of impact followed by a year long "lifestyle challenge" will focus on personal habits as elements of a sustainable lifestyle. "Sustainable Sundays" will encourage students to explore enjoyable, low impact leisure activities in the Albion area. A weekly photo and blog contest will encourage participation. "Mindful Mondays" will gather all parts of the community for discussion of specific issues. In this forum, students, staff and faculty can explore various options for lowering the College's carbon footprint. "Conservation Tuesdays" will be a monthly film series, featuring films such as *Addicted to Plastic, Kilowatt Ours, Crude Awakening,* and *The Story of Stuff. "*Waste-free Wednesdays" will encourage students to be especially mindful of their material and energy consumption. We have developed a carbon footprint calculator specific to living on our campus to allow students to quantitatively monitor their impacts. "Food for Thought Thursday" will focus on the health and environmental impact of diet, and several lectures throughout the year will support this theme. Every week, the dining hall and snack shop will feature at least one local, natural or organic food item. "Fit and Efficient Fridays" will explore the interconnections between sustainability and wellness. Walking will be encouraged. Physical Education majors will prepare a different program for the community each week. "Community Service Saturdays" will encourage community involvement. Already scheduled are a river cleanup, a community tree planting, work with Habitat for Humanity, and a spring flower planting.

Another outcome of strategic planning was a pledge to support students' career development. In support of both this pledge and the sustainability theme, we will host a green jobs panel, featuring alumni and other professionals and exploring ways students can combine majors and professional interests with careers related to sustainability.

Our artist- in-residence will be Betsy Damon who is recognized for her work that reconnects communities with their water sources. Betsy is open to collaborating with students in relevant classes in creating water themed projects.

Additional events of the themed year include a student-run sustainability fair, a poster session for classes that engage students in sustainability research, and an enhanced Recyclemania event. The final event in the year will be the spring sustainability fair and retrospective to be held at our Nature Center on Earth Day. Guided tours celebrating changes made by Dinning Services, Grounds, Facilities and other programs will be offered.

This theme will be repeated in the 2013-14 year; for this year's incoming class there will be an opportunity to see the changes that have occurred during their time at the College.

The efforts described above constitute our efforts to reach all students. For students who want more academic exposure to the issue of climate change, we have numerous opportunities, from single classes to whole programs of study.

Several regularly-offered classes deal with climate change as a primary subject. On the introductory level, Oceans and Atmosphere explains the basic workings of weather and climate, climate history, the basics of climate change science, and asks students to consider consequences of continued climate change. The English class "Armageddon and the Environment" deals with literature of apocalyptic environmental change, and extensively treats climate change from the perspective of the humanities. These courses can be used to fulfil the College's Environmental Category requirement. At the upper level, "Glaciers and Climate Change" considers climate history and science at the advanced level for science majors, and is a stepping stone for graduate work in this area. As a course project, Environmental Economics students have completed cost/benefit analyses of several options for the College in reducing its carbon footprint presenting results in a way compatible with the AAUPC recommendations.

For students who want more in-depth work, the College's Center for Sustainability and the Environment offers courses and curricula in support of environmental sciences and environmental studies concentrations. Each year the program offers the course "Ecology and Environmental Issues," focusing on a region in the United States. An end of the term, a field trip to the region is a part of the course allowing students to discuss issues with professionals in the field. Inevitably, some element of climate change is considered in all regions. In recent years our students have seen first hand mountain top removal sites in West Virginia, impact of sea-level rise and salt water incursion in south Florida, anticipated changes in hardwood forests in Kentucky, modern solar electric generating stations in California, and efficient urban transportation and bicycle path development in Oregon. These trips are taken by rail, exposing students to the potential of a better transportation infrastructure.

The E-house program is a sustainable living /learning experience administered by the Center, but available to all students. This program demonstrates the combination of technology and lifestyle choices appropriate for a sustainable lifestyle. A ½ unit seminar "Sustainable Living" is offered as part of the E-House program.

The Center also encourages development of its students through co-curricular activities. Most of the climate-activists on campus are members. They have completed our carbon audits, started a bicycle lending program, won a US EPA $P^3$ grant for an energy education program, run the Recyclemania program on campus, started a student farm and hosted semi-annual sustainability fairs. The fall fair has become part of our first year experience program, insuring attendance by the bulk of the first year class.

We anticipate building on these educational activities in the future. We need to complete an inventory of the extent to which present classes deal with climate issues. There is discussion of making our environmental category deal more explicitly with sustainability. Our Center for Sustainability and the Environment is working on both environmental science and environmental studies majors. Perhaps most significantly, an anticipated outcome of our up-coming sustainability themed year is transformation of many College operations, and our immediate challenge is to see that this is an open and educational process our students and all others involved.