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Macalester College Sustainability Plan September 2009

Macalester College Sustainability Office

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MACALESTER COLLEGE
Sustainability Plan

September 2009

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^(PCC) indicates items which are required by the American College and University Presidents Climate Commitment

Executive Summary

Sustainability is the continuous effort to meet the needs of the present generation without compromising the ability of future generations to meet their needs by working toward a healthy environment, social justice, and a strong economy.
At Macalester, sustainability is infused throughout our core values of academic excellence, internationalism, multiculturalism, and service to society.

Macalester College, 2009

Macalester College is committed to addressing climate change by taking responsibility for our institution's carbon footprint, rapidly reducing it, and becoming carbon neutral by 2025 and Zero Waste by 2020.

In 2007, scientists from around the world came to consensus that the average world temperature will increase three degrees Celsius by 2100. In completing this long-term, strategic, comprehensive sustainability plan, Macalester is proud to be a leader among American colleges and universities in addressing climate change. This plan, the result of a year-long, campus-wide strategic planning process, demonstrates our commitment to living our values and preparing each generation to confront the challenges they will face in the years ahead.

For the past three decades, Macalester has proactively implemented numerous sustainable practices. However, until now, the college has never set specific, measurable and tangible goals for sustainability that will touch every part of the institution. Macalester is one of a handful of colleges in the nation to adopt such a comprehensive, forward-looking plan.

This plan articulates concrete goals and actions the college will take, including:

- Achieve carbon neutrality by 2025
- Produce zero waste by 2020
- Integrate sustainability into curriculum and student programs
- Adopt a 'green building' policy to reduce emissions in the construction and operations of facilities
- Decrease carbon emissions from travel
- Adopt a responsible purchasing policy

This plan organizes specific tactics that will significantly reduce Macalester's carbon footprint, promote behavior change within the campus community, and integrate sustainable practices into operations, under three broad categories:

- **Leadership:** by demonstrating and encouraging innovation and action
- **Operations:** designing, implementing and improving processes

- **Education:** changing behavior and raising awareness on campus and in the community.

To ensure the college delivers on the ambitious goals in this plan, we will annually track our greenhouse gas emissions and other sustainability metrics every two years.

The cost of implementing this plan will be financed by investing in energy efficiency and using the payback to fund climate neutrality/sustainability projects. In addition, the college will investigate innovative financing opportunities.

This plan is intended to guide sustainability projects on Macalester's campus and to encourage collaboration with other groups, especially other institutions of higher education, as well as in the broader community.

Finally, this plan is intended to fulfill Macalester College's commitment under the American College and University Presidents Climate Commitment (ACUPCC). The plan combines both the ACUPCC institutional action plan for climate neutrality and the outcomes from a year-long internal sustainability strategic planning process.

Introduction

For the past three decades, Macalester has been a leader in implementing sustainable practices (Appendix A). However, until now, the college has never had a long-term, strategic plan that is focused on every aspect of the institution, and establishes specific, measurable sustainability objectives and goals.

This *Sustainability Plan* articulates the sustainability, leadership, environmental, social, educational, and financial objectives that Macalester College will achieve to fulfill its obligations under the American College and University Presidents Climate Commitment (ACUPCC). The plan combines both the required institutional action plan for climate neutrality that ACUPCC requires and the outcomes of a year-long college-wide sustainability strategic planning process.

The plan is organized into four sections, plus appendices: Leadership, Operations, Education, and Implementation and Progress.

The Leadership section articulates Macalester College's long-term vision for sustainability and includes an ambitious goal to achieve climate neutrality by 2025. The Operations and Education sections articulate goals and deadlines that pertain specifically to campus operations and mission. Finally, the Implementation and Progress section explains how Macalester College will track, finance, and encourage its sustainability progress. The Appendices include a brief history of sustainability at Macalester, an overview of the strategic planning process, and baseline greenhouse gas emissions data.

What is Sustainability?

In 2008-09, Macalester's Sustainability Office facilitated a campus-wide strategic planning process that engaged diverse stakeholders from across the college community to develop concrete strategies and tactics the college could adopt to reduce its carbon footprint and advance its academic and civic mission.

As part of the planning process, the Macalester community expanded on the Brundtland Commission's classic 1987 definition¹ to create a Macalester-specific definition of sustainability:

Sustainability is the continuous effort to meet the needs of the present generation without compromising the ability of future generations to meet their needs by working toward a healthy environment, social justice, and a strong economy. At Macalester, sustainability is infused throughout our core values of academic excellence, internationalism, multiculturalism, and service to society.

Clearly, sustainability is a value and a practice at Macalester College that is core to our mission. This definition of sustainability is broad and has implications for all aspects of campus life,

¹ "Report of the World Commission on Environment and Development." *United Nations*. 1987. <http://www.un.org/documents/ga/res/42/ares42-187.html>.

operations, and academic and civic engagement programs. It is also closely tied to ecological vitality, social and cultural diversity, financial stability, and community-building.

Strategic Planning Process

The Sustainability Office engaged stakeholders from across Macalester to develop this strategic plan. The campus-wide, participatory strategic planning process engaged a team of students, faculty, staff, and administrators to answer the overarching question, “How does sustainability advance the core mission of Macalester?” The planning team developed goals, obstacles, strategies and priorities for achieving campus sustainability².

During the summer of 2009, Sustainability Advisory Committee task forces analyzed the goals that had been drafted through the planning process and the climate neutrality recommendations developed by the 2009 Environmental Studies Senior Seminar class. The goals in this plan are the culmination of this planning process.

Baseline Greenhouse Gas Emissions ^(PCC)

To understand where to focus our sustainability efforts, it was critical that Macalester have a solid understanding of its current emissions.

The college’s 1990-2006 greenhouse gas emissions were originally calculated by the 2008 Environmental Studies Senior Seminar using the Clean Air/Cool Planet (CACP) calculator. In 2009, the Sustainability Office updated the calculations. In 2007-2008, Macalester College emitted 19,351 metric tons of carbon dioxide equivalents (Figure 1)³.

Energy (including electricity use and heat) is the largest source of emissions and produces approximately 66 percent of the college’s annual emissions. Transportation is the second largest source of emissions followed by paper, solid waste, wastewater, and agriculture/landscaping.

² A full summary of the strategic planning process is available at: www.macalester.edu/sustainability.

³ The full report is available at: <http://www.macalester.edu/sustainability/data/datamain.html>

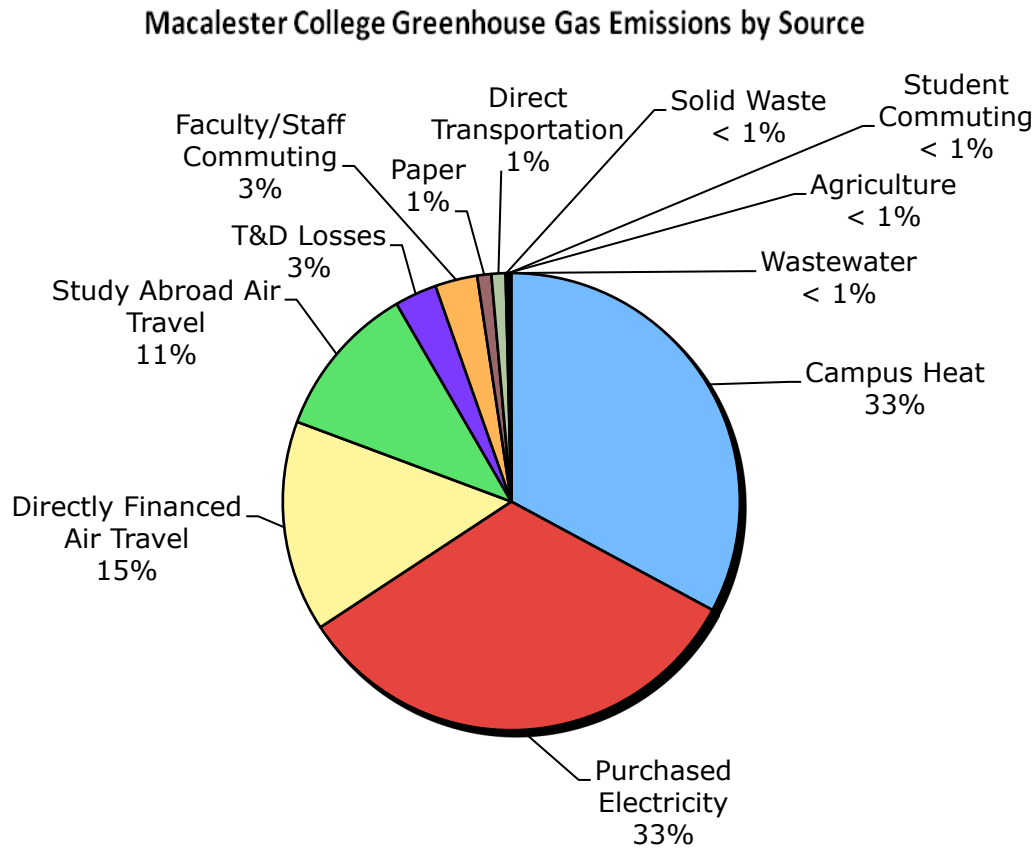


Figure 1. Macalester College Greenhouse Gas Emissions by Source for 2007-08

For the past 19 years, CO_{2e} emissions have increased annually by approximately 340 metric tons. Projected emissions, based on historical trends, are shown by the red line in Figure 2. If Macalester achieves its goal of carbon neutrality by 2025, we will produce 10,063 metric tons fewer than the 2007-2008 baseline. Carbon neutrality will then be achieved using off-site renewable energy or carbon offsets.

Past Greenhouse Gas Emissions and Planned Reductions

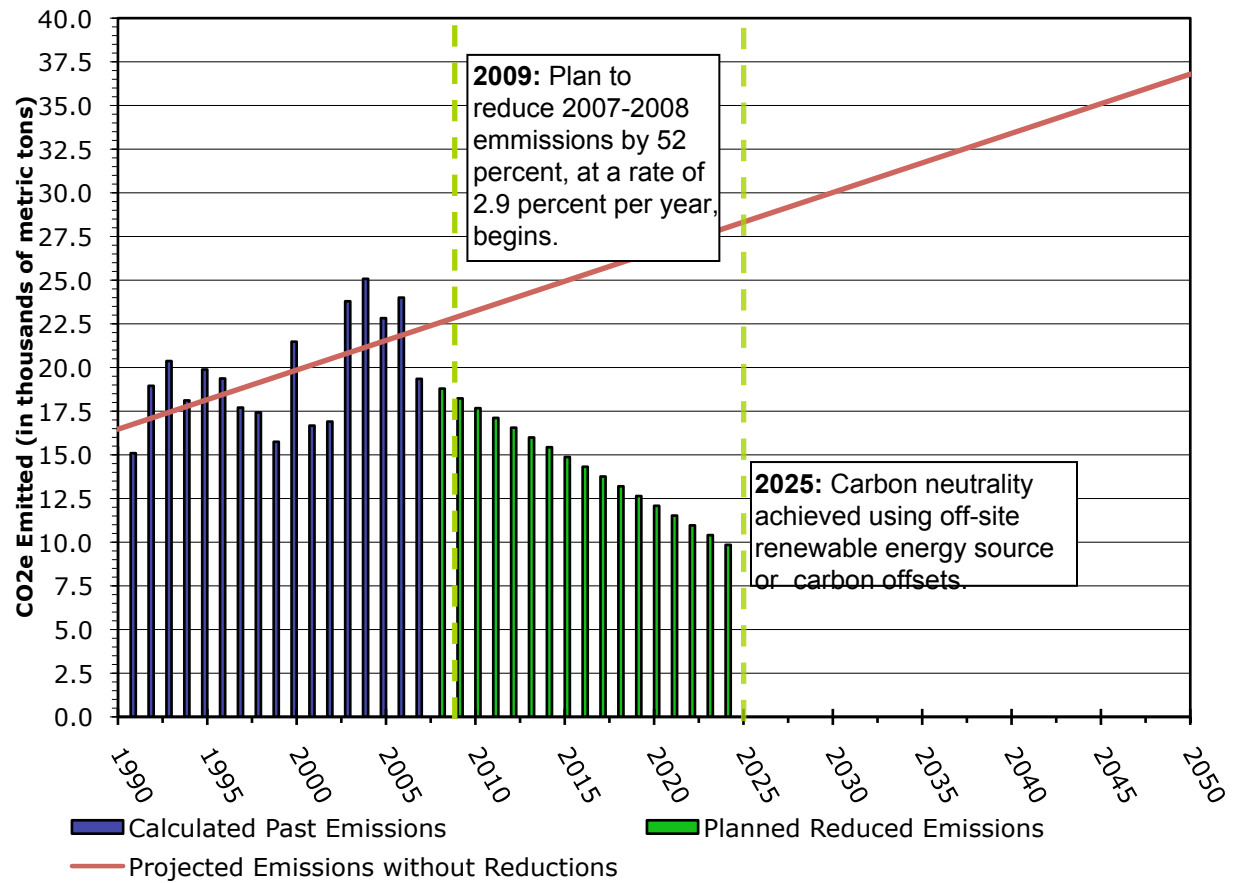


Figure 2. Macalester College Emissions Trajectory

Sustainability Strategic Plan

Leadership, operations and education are the strategic directions that guide Macalester's sustainability plan. Within these broad categories, we've developed goals and strategies, the majority of which were refined from the recommendations of the 2009 Environmental Studies Senior Seminar's *Climate Action Plan Recommendations*, and the priorities identified by the sustainability strategic planning team. To ensure the plan is comprehensive, goals and strategies were added to address a handful of specific issues. Responsible parties and deadlines are listed in parentheses, if applicable.

Macalester recognizes that achieving sustainability is an ongoing process. The goals in this report are intended to guide the college's progress and are not meant to be limiting.

1.1 Leadership: Demonstrating leadership by encouraging innovation and action to foster sustainable communities^(PCC)

Macalester is committed to being a leader among institutions of higher education to create the optimal educational experience, demonstrate sustainable business practices, and foster sustainable communities. Macalester understands that its commitment to sustainability must reflect its interdependency with other local and global communities and ecosystems. As well, we believe that our economic prospects rest on the flourishing of sustainable economic practices and activities, and we recognize the liability that unsustainable industries invariably pose.

Using the lens of sustainability, Macalester will teach and practice local and global citizenship. We will support sustainable community development beyond the campus by proactively engaging the broader community in the transition to sustainability. The college will use its purchasing power (alone or in purchasing pools) and educational actions to influence and provide examples of sustainable behavior. Macalester's commitment to looking beyond its own boundaries to make the world more sustainable (rather than simply minimizing its institutional negative impact) is a crucial responsibility that is reflective of the college's core values.

Goals – Leadership

The following goals and attendant strategies articulate Macalester's commitment to leadership in sustainability, both on campus and in the broader community.

- *Achieve climate neutrality by 2025. Carbon neutrality occurs when energy and resources usage does not increase the net amount of carbon dioxide or other greenhouse gases in the atmosphere over time. To lessen the college's negative environmental impact and to demonstrate leadership, Macalester is committed to being carbon neutral by 2025.*

To ensure our efforts to achieve climate neutrality by 2025 are on track, we've set benchmarks, as follows:

- ✓ 2015 – 17.5 percent reduction from 2007-2008 levels
 - ✓ 2020 – 35 percent reduction from 2007-2008 levels
 - ✓ 2025 – 52 percent reduction from 2007-2008 levels, 48 percent would be offset or obtained from off-site renewable energy⁴.
-
- *Serve as a model for sustainability by managing Macalester as a leader in sustainability in operations*
 - *Prepare students to be community and world leaders in sustainability through academic and co-curricular educational efforts*
 - *Cultivate and empower leadership by students, staff, faculty, and administrators*
 - *Partner with other institutions to strategically leverage broader change toward sustainable systems*
 - *Use campus operations as a teaching tool*

Strategies: Demonstrate leadership and achieve carbon neutrality by 2025

I. Invest in Energy Efficiency

The potential cost savings from increasing energy efficiency on campus are significant; energy efficiency strategies should be implemented as soon as possible.

Preliminary data suggest that campus energy re-commissioning projects may cost \$250,000, with a three-year payback. Savings from these projects can be reallocated to implement the following strategies thereby creating a self-funding path to carbon neutrality.

Macalester will track the savings from energy efficiency projects and other sustainability programs; the savings from early initiatives will be accumulated and used to finance more expensive but substantial future projects.

II. Transition to Carbon-Neutral and Renewable Fuel Sources

Macalester's electrical emissions benefit from the Minnesota Renewable Energy Standard that requires Xcel Energy to generate 30 percent of its power from renewable sources by 2020. Macalester also has some limited opportunities to develop renewable sources on campus.

⁴ These interim goals are based on the analysis of the 2009 Environmental Studies Senior Seminar recommendations available at: <http://www.macalester.edu/sustainability/data/macalestercarbonneutrality052009.pdf>. The class estimated a 52% reduction of emissions which calculates to a 2.9% annual reduction.

III. Offset the Remaining Emissions

Preliminary analyses show that Macalester will likely need to offset or develop offsite renewable energy for 48 percent of its emissions by 2025. Offsets (well-researched and tracked “traditional” offsets or off-site renewable energy generation) should be implemented after energy efficiency and on-site renewable energy options are in place.

IV. Collaborate

We will reach out to regional, national, and international higher education and sustainability networks for inspiration, assistance, and joint endeavors. Collaboration will occur across hierarchical lines, incorporating ideas of our students, staff, faculty, alumni, parents, and community experts.

1.2 Operations: Realizing our mission by designing, implementing and improving our process

Critical to Macalester's sustainability plan is integrating efforts into every aspect of operations, including buildings, transportation, landscaping, stormwater, recycling and waste, and purchasing.

Building Green^(PCC)

Macalester's commitment to green building is increasingly evident across campus.

Markim Hall, home of the Institute for Global Citizenship and Macalester's newest building, is only the second facility on a college or university campus in Minnesota and the first in the City of St. Paul to be designed to a LEED-platinum standard.

EcoHouse is a renovated student residence that serves as a living and learning laboratory for students and a model for the community. Among the green features of the house are a domestic solar hot water system, a recyclable steel roof, wall insulation, and high efficiency energy star appliances.

Similarly, sustainable criteria were used in the design of Macalester's new athletics and wellness facility, the Leonard Center, which opened in October, 2008. More than 90 percent of the field house, which was demolished to make way for new construction, was reused.⁵

The campus also hosts two student-designed green roofs, one on a residence hall, and the other on an event and program center.

Goal—Building Green

Incorporate sustainability principles and practices into all construction and renovation projects, thereby reducing Macalester's carbon footprint and demonstrating the college's environmental commitment.

Strategies: Building Green

I. Implement a Green Building Policy

All new construction or major renovations must meet the Minnesota B3 guidelines or be designed to at least a LEED silver standard

Sustainability Advisory Committee and Facilities Services, 2009-2010

⁵ An article in *Construction Executive* reporting on the recycling of the former Macalester athletics facility can be found online at: http://www.constructionexec.com/Issues/June_20092/Features2.aspx.

II. Systematically share information and gather feedback about major infrastructure projects with the Macalester community

Sustainability Advisory Committee and Facilities Services, 2009-2010

III. Develop green building metrics for the campus

Sustainability Office and Facilities Services, 2009-2010

Energy

The majority of Macalester's heating and cooling demand and a portion of its hot water needs are met by a centralized high-pressure closed-loop steam plant. From September to May, the system provides heat and hot water to 26 campus buildings and 11 privately- and college-owned residences. During the summer, small water heaters across campus supply hot water. The main system burns natural gas, and #2, and #6 fuel oil. The type of fuel used (natural gas or fuel oil) varies based on heating needs and the relative price per Btu of different fuels.

There are three sites of renewable energy generation on-campus: A small wind turbine near Olin Rice Science Hall; a solar hot water system in EcoHouse that reduces the need for gas powered hot water; and an educational photovoltaic array on the roof of the Olin Rice Science Center. However, these sources do not produce a significant portion of the energy consumed on campus.

Macalester Facilities Services has worked to improve energy efficiency since the 1960s and many of these projects have resulted in significant cost savings. For example, the 2006-2008 re-commissioning of Olin Rice Science Center included a retrofit of the HVAC system which now produces \$50,000 in annual energy savings. Similarly, in 2008, Macalester replaced its campus air-conditioning system with a highly efficient new chiller system. A re-commissioning of all main campus buildings is currently underway, with recommendations expected by the end of the year. We also reduced the number of vending machines, and associated electricity, waste and maintenance costs, by 20 percent in 2009. Finally, our Clean Energy Revolving Fund (CERF), which was created in 2007 to finance investments in sustainability, has supported projects which have saved \$70,000, and reduced CO_{2e} by nearly 1.134 metric tons and water use by more than half a million gallons.

Goal-Energy

Invest in energy efficiency and switch to carbon-neutral fuel sources.

Strategies—Energy: Short-term

I. Implement energy efficiency projects with a five-year or better financial payback and projects with longer paybacks where practical

Facilities Services and the Sustainability Advisory Committee, 2009-2010

- II. Implement systems to individually monitor energy usage for buildings, floors, and offices by 2015**

Sustainability Office and Facilities Services, 2014-2015

- III. Investigate creating an energy-efficiency maintenance position**

Facilities Services, 2009-2010

- IV. Investigate new ways to form partnerships (with other schools, community groups, utilities, etc.) to generate, own, and reap financial benefit from clean energy generation**

Sustainability Office, 2010-2011

- V. Investigate opportunities for energy savings through behavior change, information feedback loops, and outreach**

Sustainability Office, ongoing

Strategies—Energy: Mid-term

- I. Eliminate fuel oil usage by switching to natural gas by 2015**

Facilities Services, 2014-2015

- II. Install solar panels on Markim Hall when it becomes economically practical**

Facilities Services, 2014-2015

- III. Research carbon-neutral, renewable fuel sources such as biogas with the goal of switching to a carbon-neutral fuel at Macalester College by 2025**

Facilities Services and Sustainability Office, 2024-2025

- IV. Investigate renewable energy opportunities and implement renewable energy programs as they become practical**

Sustainability Office, ongoing

Strategies—Energy: Long-term

- I. Install on-site energy systems**

Macalester College will implement on-site renewable energy as these projects become financially practical.

Facilities Services and Sustainability Office, ongoing

Water

Markim Hall and the EcoHouse have dual flush toilets and water-efficient fixtures. Since 2007, water efficiency projects in specialty student housing have saved 522,562 gallons of water.

Goal – Water

Reduce the amount and improve the efficiency of water use on campus.

Strategies—Water: Short-term

- I. **Install water efficient fixtures in all new buildings and major renovations**
Facilities Services, ongoing
- II. **Replace old fixtures with efficient fixtures when replacement is warranted**
Facilities Services, ongoing
- III. **Investigate and support behavioral strategies and practices that will reduce water consumption**
Sustainability Office and Facilities Services, ongoing

Transportation ^(PCC)

Airline Travel

Macalester-funded air travel represents the vast majority of our travel-related greenhouse gas emissions and transportation costs. Institutionally-sanctioned air travel currently represents 26 percent of Macalester's total greenhouse gas emissions. Excluding student study abroad, Macalester College funded \$902,526 of air travel during the 2007-2008 fiscal year.

Goal—Airline Travel

Macalester College will promote reductions in airline emissions through voluntary means and will offset the rest of the travel emissions. By utilizing voluntary means, the College will reduce emissions from airline travel 10% from 2008 levels by 2025.

Strategies—Airline Travel: Short-term

- I. **Promote direct flights and travel by train, bus, or other mass transit.**
Purchasing and Sustainability Office, 2009-2010
- II. **Increase promotion of, and training for, teleconferencing and videoconferencing.**
Information Technology Services and Sustainability Office, 2009-2010
- III. **Implement a voluntary offset program for department travel emissions**

Strategies—Airline Travel: Mid-term

- I. Investigate options for offsetting all college-funded airline travel in a responsible, sustainable manner, with a goal of implementing such offsets by 2012**

Sustainability Office, 2011-2012

Study Abroad

Learning within other cultures is central to Macalester's mission. However, study abroad contributes 11 percent of the college's total GHG emissions.

The 2009 Geography Senior Seminar students found that the majority of students studying abroad go to Europe and Asia, while relatively few students study in closer destinations, such as Mexico, the Caribbean, and Central America (Figure 3). These countries may offer comparable, academic and cultural study abroad experiences without incurring as many airline travel emissions as other locations.

They also noted that reducing the number of trips and staying longer in a single destination will reduce emissions⁶.

⁶ The full report, "[An Institutional Carbon Footprint: The Assessment of Transportation-Related eCO₂ Emissions and Applied Study of Mitigation Policies for Macalester College](http://www.macalester.edu/sustainability/data/macalestercarbonfootprint.pdf)" - Laura Cullenward, Kim DeLanghe and Mark Stonehill, Spring 2009, is available at: <http://www.macalester.edu/sustainability/data/macalestercarbonfootprint.pdf>.

Macalester College Study Abroad: Spring 2008

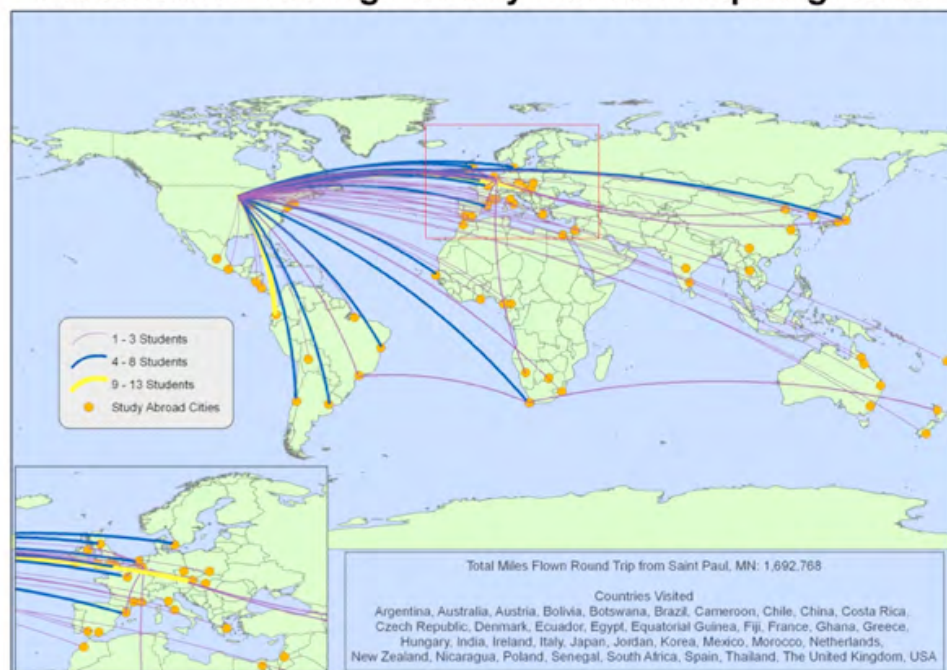


Figure 3. Macalester Student Study Abroad Travel Locations 2009

Goal—Study Abroad

Reduce greenhouse gas emissions from study abroad travel by 10% without compromising the study abroad experience. Increase the awareness of the connections between travel and GHG emissions.

Strategies—Study Abroad: Short-term

- I. **Raise awareness of the environmental impact of study abroad among students.**
The Study Abroad website will provide relevant information, emphasize the importance of direct flights, and encourage the Macalester community to consider the distance and duration of travel

Study Abroad and Sustainability Office, 2009-2010

- II. **The Study Abroad office will investigate the Green Passport program in place at other schools**

Study Abroad and Sustainability Office, 2009-2010

Strategies—Study Abroad: Mid-term

- I. **Develop a voluntary travel offset program for students by 2012.**

Sustainability Office and Study Abroad, 2011-2012

Commuting

Faculty, staff, and students commuting to campus are a relatively small percentage of GHG emissions for Macalester, approximately 412.9 MT CO_{2e} per year, which is approximately 3 percent of total emissions.

However, reducing the number of single-occupancy vehicles driven to campus would further reduce transportation emissions and can be relatively easily accomplished due to existing partnerships. Several institutional programs and policies that strengthen the sustainability of Macalester's transportation system are already underway, including:

- *ZipRide*, an online ride sharing and carpooling board implemented in March 2009
- *Subsidized Bus Passes*, one of two immediate actions taken by Macalester in 2008 to move towards fulfilling the American College and University Presidents Climate Commitment. This program currently includes 50 percent off pay-per-ride SuperSaver cards and 20 percent off unlimited “Go To (College)” cards and monthly passes which have dramatically increased college transit ridership.
- *MacBike Share*, a joint collaboration between MacBike, the Information Desk, the Library, and Student Employment implemented in 2006 to provide bicycles and related equipment to students, staff, and faculty
- *HOURLCAR*, a car-sharing program that serves Macalester and the immediate community.
- *Priority, designated parking for those with low-emitting vehicles or who carpool* will be installed in 2009.
- *Twin Cities Bike/Walk to Work Day* encourages employees across the Twin Cities to bike or walk to work one day each year. Macalester College won the Twin Cities workplace competition in 2008.
- *Bike/Walk to Work Coffee*, sponsored by the Sustainability Office, invites employees who bike or walk to work to complimentary coffee once a week in the summer and twice a month during the academic year.
- *First-year car ban*, first-year students are not allowed to have cars on campus.
- *Pedestrian-oriented development projects*, led and funded by Macalester's High Winds Fund, include installing planted medians on Grand and Snelling Avenues, adjacent to campus to calm traffic and improve pedestrian and bicyclist safety.
- The “*Walk to Work*” Program, funded by Macalester's High Winds Fund, provides financial assistance for faculty and staff members to purchase homes within one mile of campus. Those who participate in the program receive “fix up” matching grants up to \$3,000 for home improvement projects.

Goal–Commuting

Reduce single-occupancy vehicles commuting to campus by at least 50 percent from 2008 levels by 2025.

Strategies—Commuting: Short-term

- **Continue subsidizing bus passes**

Treasurer, Sustainability Advisory Committee, ongoing

- **Develop new incentives and a promotional plan to encourage more faculty, staff and students to participate in existing transportation options, such as bus passes, carpooling, and the Walk to Work program**

Sustainability Office, Campus Center, 2009-2010

- **Implement a more robust telecommuting program and policy**

Employment Services and Sustainability Office, 2009-2010

- **Investigate a compressed work week and/or flexible scheduling, as ways to reduce commuting without impacting service and productivity**

Employment Services and Sustainability Office, 2010-2011

- **Develop a list of school, daycare and preschool options within walking distance to campus**

Sustainability Office, Employment Services, and Mac Parents' Group, 2010-2011

Strategies—Commuting: Mid-term

- **Support the bike share program.** Hire additional bicycle mechanics as part of the Sustainability Student Network and by establish a large permanent space on campus where bicycles can be stored and fixed by 2012.

Sustainability Office, Facilities Services, and MacBike, 2011-2012

Campus Vehicles

Macalester has landscaping vehicles, lawn care machines, and a van fleet. Currently, Facilities Services uses only electric Cushman vehicles unless a gasoline-fueled vehicle is specifically needed. The van fleet is now comprised of one half ton Chevy vans with fuel ratings under 20 miles per gallon. Departmental memberships are available for the HOURCAR, a car-sharing program, and we are developing a plan for student organization HOURCAR memberships.

Goal—Campus Vehicles

Reduce emissions from campus vehicles.

Strategies—Campus vehicles: Short-term

- **Investigate options for replacing the current van fleet with alternatively-fueled and/or more efficient vans**

Facilities Services, 2010-2011

- **Investigate how campus vehicles are used to determine if smaller, more efficient vehicles would be appropriate for campus use**

Facilities Services, 2010-2011

- **Promote department and student organization use of the HOURCAR for small numbers of people**

Sustainability Office, Campus Programs, 2009-2010

Strategies—Campus Vehicles: Long-term

- **As plug-in-electric (or other low-carbon) vehicles enter the market and become financially viable, Facilities Services will conduct periodic research on the feasibility of converting the vehicle fleet**

Facilities Services, ongoing

- **Investigate opportunities for biodiesel use by campus vehicles**

Facilities Services, 2014-2015

Landscaping ^(PCC)

Macalester College property includes our main campus, college-owned houses, High Winds-owned commercial and residential properties, and the Katherine Ordway Natural History Study Area.

The Grounds department, part of Facilities Services, is responsible for landscaping, snow removal and contracted waste hauling on the main campus. The main campus consists of 53 acres, which includes approximately 27.5 acres of turf and ornamental gardens, 545 parking spaces, six miles of sidewalk, and five acres of irrigated athletic fields.

Sustainable landscaping strategies already in place include mulching mowers, a lawn aeration program, and strategic watering to reduce evaporation. Native plants—which require less water and fertilizer—are included in the campus prairie, campus raingarden, and Markim Hall landscaping. In 2008 the Grounds department hired its first sustainability student worker.

Goal –Landscaping

Maintain grounds in a sustainable and educational manner while providing green space for recreation and events.

Strategies—Landscaping: Short Term

- **Develop a record-keeping and information sharing system for data about fertilizer, biodiversity, and water use.**

- **Develop a landscaping plan to:**
 - Improve stormwater control
 - Maximize building energy efficiency
 - Optimize paved surface temperature
 - Encourage biodiversity by creating livable habitats
 - Convert unused lawn space to low-maintenance, preferably native landscape
 - Increase perennial, functional, and diverse landscaping on campus

Facilities Services and Sustainability Office, 2011-2012

- **Develop a turf management plan that balances sustainability with the ability to grow and maintain turf grass that can sustain heavy recreation use**

Facilities Services, 2012-2013

Strategies—Landscaping: Long-term

- **Ensure the de-icing products the college uses require the least energy to produce and have the least harmful environmental impact**

Facilities Services, 2011-2012

- **Investigate strategies to meter and reduce irrigation**

Facilities Services, 2014-2015

- **Investigate campus-wide yard and food waste compost options**

Zero Waste Committee, 2011-2012

Stormwater

Macalester's proximity to the Mississippi River, the stormwater pollution attributed to Macalester's broader neighborhood, and the opportunity for educational and research programs, make stormwater reduction an integral part of campus sustainability.

Of the 13 stormwater monitoring sites near Macalester, the one closest to campus (Kittsondale), reports the highest relative levels of total suspended solids and total phosphorus.

Currently, there are several stormwater control pilot projects on campus used to test the feasibility of various ideas and as educational tools. Macalester has two green roofs: a 300 sq. ft. green roof on a covered walkway between two residence halls (Doty and Turck) and a 1,350 sq. ft. green roof installed on Kagin Commons.

A campus rain garden (on the north side of the library) and prairie (on the south side of Olin Rice) also hold stormwater. A rain barrel is installed at the EcoHouse. In addition, porous

pavement has recently been installed near the Ruth Stricker Dayton Campus Center, in front of Markim Hall, near Weyerhaeuser Memorial Chapel, and in front of the Library.

Goal –Stormwater

Reduce the pollution, quantity, and speed at which water runs off of Macalester College's campus by infiltrating the first inch of precipitation on campus.

Strategies—Stormwater: Short-term

- **By 2011, develop a campus-wide, comprehensive storm water plan that identifies short and long term strategies, and priority opportunities (such as new building or renovation projects), for reducing storm water by infiltrating the first inch of precipitation.**

Facilities Services, 2010-2011

- **Implement appropriate storm water/biodiversity projects across campus**
- **Promote communication amongst the Sustainability Office, building project designers, landscaping managers, students, the Macalester College Student Government, faculty, and staff, as large projects are planned and undertaken**

Facilities Services, ongoing

Sustainability Advisory Council, ongoing

Recycling and Waste ^(PCC)

Currently, Macalester generates approximately 290 tons of solid waste per year. Twenty five percent of this waste goes to a Resource Recovery Technologies incinerator in Newport, Minn., and 75 percent goes to Seven Mile Creek landfill, which captures methane and uses it to generate electricity. A 2006 baseline study by Eureka Recycling found that only 15 percent of Macalester's waste stream by weight was unusable, 48 percent was potentially recyclable, 30 percent was potentially compostable, and 7 percent could be diverted through reuse programs. In 2007, the recycling rate was 18 percent and in 2008 it was 25 percent.

Since 2007, Macalester has had a Zero Waste policy and a Zero Waste Committee. Among the initiatives we've implemented to reduce waste are:

- Contracting with Barthold Farms in St. Francis, MINN., to take all food waste generated at Café Mac and Catering Services for use as hog feed.
- Collaborating with Habitat for Humanity to reuse items students no longer wanted, hosting a student group garage sale, improving recycling collection, and implementing electronics recycling for students

- Providing reusable take out containers at the campus dining hall and discounting coffee purchased in refillable mugs
- Creating a free, online service (MacFreeSwap) for students, faculty and staff to barter, exchange or give away unwanted items

Goals—Recycling and Waste

Achieve zero waste by 2020 and increase Macalester's recycling rate to 40 percent by 2010-2011.

Strategies—Recycling and Waste: Short-term

- **Develop a system to monitor recycling, waste, e-waste, and reuse programs and assess current diversion rates and cost savings (or expenditures) from these discard programs**

Zero Waste Committee and Facilities Services, 2009-2010

- **Develop a recycling and reuse outreach program**

Zero Waste Committee, 2009-2010

- **Develop a paper reduction plan and outreach campaign**

Zero Waste Committee, Information Technology Services, Library, and the Sustainability Office, 2009-2010

- **Develop a guide for sustainable events to assist campus event planners.**

Zero Waste Committee and Sustainability Office, 2009-2010

- **Increase composting at EcoHouse and the Veggie Co-op by providing additional training to students**

EcoHouse students, 2009-2010

- **Conduct a follow-up to the 2006 Eureka study to measure current waste and understand whether recent initiatives have had a measurable impact**

Zero Waste Committee, 2010-2011

- **Develop program or partnership to reduce and recycle plastic bags, stretch wrap, and styrofoam**

Zero Waste Committee, 2011-2012

- **Compare the life cycle of plastic bottles, aluminum cans, and other package types for use in vending machines and implement a waste reduction program based on research findings**

Zero Waste Committee, 2014-2015

- **Quantify and reduce the use of plastic bottles on campus 50 percent**

Zero Waste Committee, 2104-2015

- **Participate annually in the RecycleMania competition**

Zero Waste Committee, Facilities Services, Residential Life, and Sustainability Office, annually

Purchasing

Macalester recognizes that the goods and services the college purchases have both an environmental and social impact. Thus, the college has taken steps to reduce the negative impact of apparel purchases. In 2001, we became a member of the Workers' Rights Consortium, which monitors the labor practices at apparel factories. For the past two years, the Purchasing Department has employed a sustainability student worker and has been active in promoting sustainable purchasing on campus. A responsible purchasing policy is under development and we expect it to be adopted in 2009.

Goal—Purchasing

Seek and create purchasing options that minimize Macalester's costs and promote a positive ecological and social impact.

Strategy—Purchasing

- **Implement the Responsible Purchasing Policy currently under development**

Purchasing Department, 2009-2010

- **Explore opportunities for coordinated purchasing/investment with the goal of improving the sustainability of supply chains that Macalester uses while improving access for others to those supply chains**

Purchasing Department, 2010-2011

1.3 Education: Educating Campus Community to Build a Coalition ^(PCC)

Integrating sustainability throughout the curriculum and other programs and activities that comprise the student experience at Macalester is consistent with both the college's mission and the goals of the ACUPCC.

Macalester's mission compels us to provide "high standards for scholarship and a special emphasis on internationalism, multiculturalism, and service to society." Similarly, one goal of the ACUPCC is to "make climate neutrality and sustainability a part of the curriculum and other educational experience for all students."⁷

⁷ "Text of the American College & University Presidents Climate Commitment." *American College and University Presidents Climate Commitment*. 2009. <<http://www.presidentsclimatecommitment.org/about/commitment>>.

Education for a sustainable future that examining the environmental, social justice and economic impacts of individual and community actions is also consistent with Macalester's core values of multiculturalism, internationalism, and civic engagement.

Education is essential for strengthening the culture of sustainability on campus and empowering students, faculty, staff, and the community to take action in the wider world. Macalester fosters a vibrant learning community for students through academic experiences in the classroom guided by faculty, and through experiences beyond the classroom, guided by student affairs educators.

Student Learning in the Classroom ^(PCC)

Academic courses and experiences offer rich opportunities and give students the knowledge and skills to be leaders in sustainability in their personal and professional lives after graduation.

Macalester has a strong and growing Environmental Studies department. Environmental Studies students have been involved in academic work that provides invaluable contributions to the development and implementation of any sustainability effort. Projects to date have included including research on the EcoHouse, studying campus greenhouse emissions and developing recommendations for an institutional climate action plan.

However, for Macalester College to continue to lead on issues of sustainability and meet student learning and broader community needs, it is essential that sustainability be further infused throughout the curriculum. A wide variety of academic disciplines can find relevant teaching examples centered on sustainability issues. These include case studies, research projects, service learning opportunities, and historical references. The environmental aspects of sustainability are an excellent fit in the sciences, and the social justice and economic aspects are a focus in many social science disciplines. Yet, bridging these disciplinary boundaries and integrating these aspects across the curriculum is challenging. The recommendations here are intended to help foster cross- and inter-disciplinary teaching and learning that examines sustainability from multiple perspectives.

Goal—Student Learning in the Classroom

Increase the number of students exposed to sustainability through academic work.

Strategies—Student Learning in the Classroom

- **Develop faculty training opportunities for sustainable classroom management** (i.e. reducing paper, electronic media for guest speakers, etc.)

Information Technology Services, Provost, Sustainability Office, 2009-2010

- **Offer grants for curriculum and course development.** Curriculum development grants already exist, and the Provost has committed to offering this assistance to faculty to incorporate sustainability into courses

- **Augment faculty training by providing resources and encouragement to integrate sustainability throughout the curriculum**

Provost, Center for Scholarship and Teaching, Sustainability Office, 2010-2011

- **Track the number of sustainability courses taught.** Because sustainability courses by definition are broader than listed environmental studies courses, data about how many students currently encounter sustainability in courses is difficult to obtain. Research is needed to identify the numbers of student currently taking courses that fit under sustainability and track this progress over time. This data will be included in sustainability reports

Provost, Sustainability Office, 2010-2011

- **Develop resource guides by department with examples of syllabi, assignments, service learning, course materials, and other tools to assist faculty who want to include sustainability as part of courses they teach and research they conduct with students**

Sustainability Office and Provost, 2011-2012

Student Learning Outside the Classroom ^(PCC)

Macalester is a vibrant learning community where students are highly motivated to learn beyond the classroom. This informal learning takes place through experiences such as residential living, involvement in student organization, on- and off-campus work study, community service, internships, intrapersonal and interpersonal conflicts, time management, spiritual exploration, engaging with others across difference, and personal health and wellness. Student positions dedicated to sustainability have been created in many departments (Facilities Services, Purchasing, and the Library, for example). These positions have been integral to creating, developing and implementing a number of new sustainability programs across campus, including drafting the Responsible Purchasing Policy. Sustainability has also been incorporated in new student orientation for two years.

Goal—Student Learning Outside the Classroom

Incorporate sustainability into student learning outside the classroom.

Strategies—Student Learning Outside the Classroom

- **Leverage residence hall living to educate students about sustainable living by providing information about sustainable living on bulletin boards, Resident Assistant**

(RA)-led discussions, and participating in sustainability initiatives and contests by floor and by building

Residential Life, 2009-2010

- **Explore the feasibility of adding an additional student worker position to coordinate sustainability efforts in residence halls**

Residential Life and Sustainability Office, 2009-2010

- **Identify sustainability programs for study abroad, community service, work study positions on and off-campus, and other related civic engagement learning opportunities for students**

Study Abroad, Civic Engagement Center, 2009-2010

- **Support students in creating academic and civic engagement projects to promote innovative sustainability efforts related to campus operations, and/or create Macalester-community partnerships**

Civic Engagement Center, Sustainability Office, 2010-2011

- **Identify departments or areas in which additional sustainability student employees would be valuable**

Sustainability Office and relevant departments, annually

- **Coordinate and support the Sustainability Student Network, a group of student workers who meet and discuss sustainability projects in their individual departments**

Sustainability Office in collaboration with other departments, ongoing

Campus and Community Learning ^(PCC)

Macalester strives to foster learning not just for students, but also among members of the faculty, staff, and broader community.

Macalester's new employee orientation program includes a module on sustainability (Introduction to Sustainability). The Sustainability Office also periodically presents to campus faculty and staff groups, such as the Staff Advisory Council and has partnered with Wellness and Heath at Macalester to promote healthy choices for staff. To promote further learning and discussion, the Library and Sustainability Office co-sponsored a Sustainability Book Club open to the campus and broader community in 2009.

Macalester's Civic Engagement Center has connected students with community service activities for more than 20 years and has a student worker dedicated to environmental issues. Several Macalester students have taught sustainability courses for the Twin Cities Experimental College

(EXCO), which offers community members free classes. There are currently several EXCO classes taught by Macalester students that are related to environmental, economic, and social issues.

Goals—Campus and Community Learning

Create diverse opportunities for the campus community to be involved in efforts to foster ownership of sustainability processes in all aspects of college life and operations.

Strategies—Campus and Community Learning

- **Create an online “green suggestion box” for Macalester community members to submit ideas, comments, and suggestions for improving sustainability**

Sustainability Office, 2009-2010

- **Promote sustainability across campus by requiring each administrative department to develop an annual Departmental Sustainability Action Plan.** Operations and Student Life will develop plans in 2009-2010; Advancement, Academics and Admissions will develop plans in 2010-2011

Sustainability Office and individual departments, 2011

- **Develop campus outreach programs to raise awareness of, and participation in, sustainability projects including, but not limited to, RecycleMania and the Campus Energy Challenge**

Facilities Services, Zero Waste Committee, and Sustainability Office, ongoing

Research^(PCC)

Promoting and increasing faculty research on sustainability and climate is a part of the ACUPCC. At Macalester, Environmental Studies Department faculty engages in research related to sustainability. However, comprehensive campus-wide data about faculty research on sustainability has not been compiled.

Goal—Research

Increase the amount of faculty research on sustainability.

Strategies—Research

- **Develop and implement a plan to more effectively publicize opportunities for sustainability research funding.** This may include using the Sustainability Office website, faculty-specific communications, and campus-wide vehicles
Corporate and Foundation Relations, Sustainability Office, 2009-2010
- **Survey faculty to identify ongoing sustainability research projects**
Institutional Research and Sustainability Office, 2010-2011

Implementation and Progress

Tracking^(PCC)

Tracking Macalester's sustainability progress is crucial to the implementation and success of this plan. The American College and University Presidents Climate Commitment requires annual tracking of institutional GHG emissions.

Goal—Tracking

Ensure systems, processes, and staffing is in place to accurately record and monitor Macalester's sustainability efforts.

Strategies—Tracking

- **Calculate GHG emissions annually**

Sustainability Office, annually

- **Develop additional sustainability metrics and track them every two years**

Sustainability Office and Facilities Services, ongoing

- **Report our progress to the community in a “sustainability report” every two years.**
Each biannual review will assess changing financial structures and technology and include an updated list of two-year priorities. This report will be shared with the campus community, posted on the Sustainability Office website and senior staff and trustees will be briefed on progress

Sustainability Office, 2011-2012

Financing^(PCC)

While some sustainability projects are low cost and easy to implement, others are more expensive and difficult to execute. The 2009 Environmental Studies Senior Seminar developed a set of climate neutrality recommendations that save money in the long run. While some of the assumptions in that plan may be optimistic, the set of projects they propose merits further analysis and investigation. The student plan recommends investing in energy efficiency and carbon neutral fuel sources, and paying for offsets only after other projects are implemented.

The potential cost savings from increasing energy efficiency on campus are significant. The payback from energy efficiency projects should be tracked and used to implement additional sustainability projects. This approach will ensure Macalester's path to carbon neutrality is financially prudent, even beneficial.

Goals—Financing

Invest in energy efficiency and use the payback to fund climate neutrality project and implement donor, grant, and innovative financing opportunities with sound, sustainable companies that promote positive change.

Strategies—Financing: Short-term

- **Implement all recommended energy efficiency projects with a five-year energy efficiency payback and investigate those with longer paybacks**

Facilities Services, ongoing

- **Continue to investigate and obtain XCEL Energy rebates for energy efficiency**

Facilities Services, ongoing

- **Investigate grant opportunities and creative financing strategies for renewable and energy efficiency work**

Grants Office, Facilities Services, and Sustainability Office, ongoing

Strategies—Financing: Mid-term

- **Seek donor funding for sustainability projects**

Advancement and Sustainability Office, 2012-2013

Prioritization^(PCC)

In implementing this *Sustainability Plan*, high priority projects will be those meeting one or more of the following criteria:

- Significant greenhouse gas emissions reduction
- Significant environmental benefits
- Significant educational potential
- Significant social benefit
- Low implementation cost
- High opportunity for cost savings
- Partnership opportunities
- Ease (time, complexity, disruption, etc.) of implementation

Incentives

The Sustainability Strategic Planning Team recommends the college create change by rewarding and recognizing action to encourage innovation and creativity.

The Green Star Award is a two-year old program administered by the Sustainability Office to recognize students, staff and faculty who advance sustainability projects on campus. The Civic Engagement Center administers a small Action Fund to support student civic engagement projects. Faculty may request course development funding from the Provost.

Goal-Incentives

Encourage innovation and creativity in the sustainability area by rewarding and recognizing action.

Strategies—Incentives: Short-term

- **Develop a Sustainability Fund small grant fund for sustainability projects**
Sustainability Office, 2009-2010
- **Celebrate annually Green Star Award winners and other campus sustainability accomplishments**
Sustainability Office, 2009-2010
- **Investigate and develop incentives for behavioral change projects, such as energy efficiency and commuting/transportation**
Sustainability Office and relevant departments, 2010-2011

Strategies—Incentives: Mid-term

- **Investigate a formal Sustainability Award for Students, Staff, and Faculty**
Sustainability Advisory Committee, 2011-2012

Conclusion

Macalester clearly has a commitment to sustainability and reducing our impact on the environment by achieving carbon neutrality. With this plan, we now have a specific, meaningful roadmap to get there. We believe this plan is a starting point, not the end point. We will continually review progress against our goals and revise our plan as new technologies are developed and the external environment changes.

This *Sustainability Plan* integrates the ACUPCC-required institutional action plan for climate neutrality into a more comprehensive sustainability plan. It is intended to guide Macalester's approach to sustainability in all its operations both on and off campus and to encourage collaboration with other groups, especially other institutions of higher education. As indicated in Macalester's definition of "sustainability," this plan is also intended to engage all parts of the Macalester community in building a sustainable future.

We encourage students, faculty, staff and the broader community to participate in making this plan a reality and welcome feedback and input to this work on an ongoing basis.

List of Goals

Macalester's sustainability plan includes the following goals:

Leadership:

- Achieve climate neutrality by 2025.
 - 2015 – 17.5 percent reduction from 2007-2008 levels
 - 2020 – 35 percent reduction from 2007-2008 levels
 - 2025 – 52 percent reduction from 2007-2008 levels, 48 percent would be offset or obtained from off-site renewable energy.
- Serve as a model for sustainability by managing Macalester College as a leader in sustainability in operations.
- Prepare students to be community and world leaders in sustainability through academic and co-curricular educational efforts.
- Cultivate and empower leadership by students, staff, faculty, and administrators.
- Partner with other institutions to strategically leverage broader change toward sustainable systems.
- Use campus operations as a teaching tool.

Operations:

Green Buildings

- Incorporate sustainability principles and practices into all construction and renovation projects, thereby reducing Macalester's carbon footprint and demonstrating the college's environmental commitment.

Energy

- Invest in energy efficiency and switch to carbon-neutral fuel sources.

Water

- Reduce the amount and improve the efficiency of water use on campus.

Airline Travel

- Macalester College will promote reductions in airline emissions through voluntary means and will offset the rest of the travel emissions. By utilizing voluntary means, the College will reduce emissions from airline travel 10% from 2008 levels by 2025.

Study Abroad

- Reduce greenhouse gas emissions from study abroad travel by 10% without compromising the study abroad experience. Increase the awareness of the connections between travel and GHG emissions.

Commuting

- Reduce single-occupancy vehicles commuting to campus by 50% from 2008 levels by 2025.

Campus Vehicles

- Reduce emissions from campus vehicles.

Landscaping

- Maintain grounds in a sustainable and educational manner while providing green space for recreation and events.

Stormwater

- Reduce the pollution, quantity, and speed at which water runs off of Macalester College's campus by infiltrating the first inch precipitation.

Recycling and Waste

- Achieve zero waste by 2020 and increase Macalester's recycling rate to 40 percent by 2010-2011.

Purchasing

- Seek and create purchasing options that minimize Macalester College's costs and promote a positive ecological and social impact.

Education:

Education Inside the Classroom

- Increase the number of students exposed to sustainability through academic work.

Education Outside the Classroom.

- Incorporate sustainability in student learning outside the classroom.

Campus and Community Learning

- Create diverse opportunities for the campus community to be involved in efforts to foster ownership of sustainability processes in all aspects of college life and operations.

Research

- Increase the amount of faculty research on sustainability.

Implementation and Progress:

Tracking

- Ensure systems, processes, and staffing is in place to accurately record and monitor Macalester's sustainability efforts.

Financing

- Invest in energy efficiency and use the payback to fund climate neutrality projects and implement donor, grant, and innovative financing opportunities with sound, sustainable companies that promote positive change.

Incentives

- Encourage innovation and creativity in the sustainability area by rewarding and recognizing action.

Appendix A: History of Sustainability at Macalester

Macalester has long been a leader on campus sustainability (for a timeline of key milestones, see Table 1). Macalester students and Facilities Services staff were the first to systematically organize environmental work on campus beginning in the late 1960s with recycling and energy efficiency programs. Shortly thereafter, in 1973, the Environmental Studies department was established. Numerous students, faculty, and staff have implemented projects that explore sustainable food, renewable energy, waste reduction, alternative transportation, environmental justice, energy efficiency, and innovative finance as part of the vision of creating a community that is sustainable in all respects.

However, it was not until 2000 that Macalester formally established itself as a sustainability leader in among higher education institutions. That is when former college President Michael McPherson signed the Talloires Declaration;⁸ the first official statement committing to environmental sustainability made by university and college administrators. This plan tracks and expands on Macalester's implementation of the Talloires Declaration.

In 2005, Macalester included sustainability among its master plan objectives for the first time. Specifically, the master plan states that environmental and long-term performance criteria are to be included in future development, and sustainability practices are to be expanded in the everyday campus operations and maintenance. The master plan also recommends the college use sustainable design in new building and grounds projects, explore innovative and long-term cost savings technologies (such as wind and solar power), evaluate operational practices, and support student groups promoting environmental awareness on campus.⁹

In 2007, President Brian Rosenberg signed the American College and University Presidents Climate Commitment (ACUPCC), further establishing the college as a leader in sustainability and committing to developing a plan for climate neutrality¹⁰. The ACUPCC is a formal acknowledgement by college and university presidents of the urgent need to reduce greenhouse gas (GHG) emissions.

In the 2008-2009 academic year, Macalester College began to fulfill its commitment to the ACUPCC by subsidizing bus passes and purchasing only ENERGY STAR appliances to immediately reduce emissions. In 2008, the Environmental Studies Senior Seminar calculated a *Greenhouse Gas Emissions Inventory* for Macalester from 1990-2006. The 2009 Environmental Studies Senior Seminar developed recommendations for an institutional climate action plan.

⁸ The full text of the Talloires Declaration and its Macalester signatories is at <http://www.macalester.edu/environmentalstudies/talloires.htm>

⁹ Macalester College Campus Master Plan, Master Plan Report, September, 2005. (Consultants: Offices N, Bruner/Cott & Associates, Close Landscape Architecture, Jonas Design.)

¹⁰ The full text of the ACUPCC is at: <http://www.presidentsclimatecommitment.org/html/commitment.php>

Table 1: Key Sustainability Milestones and Timeline

1967-2000:

Education:

- Establish Katharine Ordway Natural History Study Area (1967)
- Create Environmental Studies Program (1973)
- Create Civic Engagement Center (1988)

Operations:

- Implement campus-wide recycling (1970s)
- Undertake numerous campus energy efficiency projects (1960s and 1970s)

2000-2007:

Policy:

- Sign Talloires Declaration (2000)
- Sign American College and University Presidents' Climate Commitment (2007)
- Master Plan includes sustainability (2005)
- Join Worker's Rights Consortium (2001)

Education:

- Establish Environmental Studies Department (2004)
- Open EcoHouse Student Residence (2007)
- Establish Lealtad-Suzuki Center (2002)

Operations:

- Install wind turbine on campus (2003)
- Plant native prairie on campus (2004)
- Create new position for a sustainability student worker in Facilities Services & Purchasing (2005)
- Install green roofs on two campus buildings (2006)
- Create Clean Energy Revolving Fund (2006)
- Create bike share program: MacBike (2006)

2008-2009:

Staff:

- Hire sustainability manager
- Establish Sustainability Student Worker Network

Policy:

- Launch sustainability strategic planning process
- Subsidized bus pass program
- Develop and implement green cleaning policy
- Create designated suppliers program

Education:

- Environmental Studies class audits campus greenhouse gas emissions and recommends actions for Climate Action Plan.

Operations:

- Markim Hall designed and built to LEED Platinum standard
- "MacFreeSwap" starts to reduce waste
- Start ZipRide carpool listing

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