



Pomona College
Climate Action Plan

September 2009

Table of Contents

Executive Summary	ii
List of Figures and Tables	v
Introduction	1
Process	1
Planning Principles	3
Prioritization of efforts	3
Purchases of offsets	3
Use of “carbon neutrality”	3
Sustainability Action Plan	4
Ongoing assessment	4
Carbon Inventory	5
Climate Action Plan inventory	5
Full Inventory	6
Emissions Projection	8
Projection Factors	9
Projection Limitations	10
Emissions Targets	11
Other college & university climate commitments	11
AB32	11
City of Claremont	11
Comparison	12
Recommended Targets	12
Guidelines for progress	13
Actions	14
Energy	14
Transportation	19
Other Emissions Sources	21
Education and Awareness	23
Implementation	25
Prioritized conservation, reduction, and awareness efforts	25
Ongoing Assessment	25
Data and Information Accessibility	26
Outreach and Information	26
Financing	27
Priority Recommendations	28
Appendix A - Environmental Policy	29
Appendix B - Participants	31

Executive Summary

Institutions across the United States are taking action in response to the now widely acknowledged threat of climate change and its effects. The American College and University Presidents Climate Commitment (ACUPCC) provides a framework for institutions to measure, analyze, and take action on their greenhouse gas emissions, and requires that signatory institutions inventory their emissions and generate a Climate Action Plan to establish target dates for emissions reduction. This Climate Action Plan, in partial fulfillment of the ACUPCC, describes Pomona College’s approach to climate change action, explains the College’s emissions inventory, and establishes priority actions for reducing emissions. This plan has been generated by the College’s Sustainability Integration Office as part of a broad Sustainability Action Plan process, which considers a wide variety of environmental issues.

Recommended Targets

This report recommends the College establish the following as goals, directly following the proposed State of California emissions reduction goals:

- 20% reduction of emissions by 2020
- 75% reduction by 2050

Recommended Progress

The following table describes the sort of progress that would be necessary to see these reductions:

	2010-2020	2021-2050
Energy use	<i>Reductions of energy use emissions from 2007-08 baseline:</i> 20% reduction from efficiency 10% reduction from conservation 10% reduction from renewables	<i>Reductions of energy use emissions from 2007-08 emissions:</i> 50% reduction from efficiency 25% reduction from conservation 25% reduction from renewables
Transportation	<i>Reductions of transportation emissions from 2007-08 baseline:</i> 5% reduction from reduced miles traveled 2.5% reduction from reduced emissions	<i>Reductions of transportation emissions from 2007-08 baseline:</i> 10% reduction from reduced miles traveled 10% reduction from reduced emissions
Refrigeration	<i>Reductions of refrigeration emissions from 2007-08 baseline:</i> Reduction from decreased energy use 25% reduction from new technologies	
Solid waste	<i>Reductions of waste emissions from 2007-08 baseline:</i> 25% reduction from reduced waste	<i>Reductions of waste emissions from 2007-08 baseline:</i> 50% reduction from reduced waste

Many of these targets are aggressive and may be difficult to achieve, but the College will continue to assess its strengths, weaknesses, and opportunities to move forward with programs and projects. This report explores a variety of actions that might be adopted to meet these goals, along with a proposed plan for implementation and financing of these programs and projects.

Recommended Actions

This report outlines a variety of actions for the College to take, organized into the following categories:

Energy

- Goal 1: Reduced energy use (conservation)
- Goal 2: Increased technological and building efficiency
- Goal 3: Increased renewable sources of energy
- Goal 4: Improved assessment of energy use

Transportation

- Goal 1: Reduced air and vehicle miles
- Goal 2: Reduced gasoline use/emissions

Refrigerants and Solid Waste

- General reduction (to be studied more in the Sustainability Action Plan)

Education and Awareness

- Area 1: Academic environment
- Area 2: Residential/work environment
- Area 3: Public/community engagement

Priority Recommendations

The following actions are recommended as the most important and effective as the College moves forward with climate action:

- >> Adopt the State of California's first emissions reduction target of a 20% reduction of current emissions by 2020 (then explore potential for meeting the State's second target)
- >> Implement HVAC setpoints/scheduling to reduce unnecessary heating and cooling
- >> Perform energy audits on targeted buildings
- >> Implement all energy efficiency projects with payback periods of equal to or less than two years (considering larger projects based on internal rate of return and as an investment of College funds)
- >> Update Green Building Standards for all new construction and renovation, mandating at least LEED Gold if a LEED-based standard is chosen and incorporating the standards of the Labs21 Program
- >> Move forward with identified renewables projects
- >> Continue to develop and offer an annual faculty development workshop on sustainability in the curriculum
- >> Develop specific funding mechanisms for sustainability programs and projects

List of Figures and Tables

Figure 1.	CAP Carbon Emissions Inventory, 2007-08	5
Figure 2.	Full Carbon Emissions Inventory, 2007-08	6
Figure 3.	Projected Growth of CAP Emissions Inventory, 2000-2060	8
Figure 4.	SCE Energy Sources Portfolio, 2007-08	10
Figure 5.	Pomona Emissions Projection vs. California and Other Institutional Targets	12
Figure 6.	Recommended Progress Compared to Recommended Goals	13
Table 1.	Climate Action Plan Carbon Emissions Inventory, 2007-08	5
Table 2.	Full Carbon Emissions Inventory, 2007-08	6
Table 3.	Change in Emissions Categories, 2000-2006	8
Table 4.	Included Growth Estimates	9
Table 5.	Emissions Reduction Commitments of Various Institutions	11
Table 6.	Recommended Progress to Meet Recommended Goals	13
Table 7.	Potential Gas and Emissions Reductions from Planned Solar Hot Water Projects	17
Table 8.	Other Institutional Faculty Development Workshops	23

Pomona College signed the American College and University Presidents Climate Commitment (ACUPCC) in April 2007. This collaborative effort of hundreds of institutions around the country provides a framework for colleges and universities to measure, understand, and mitigate the carbon emissions caused by their activities. This Climate Action Plan (CAP) provides analysis and recommendations in partial fulfillment of Pomona's participation in this agreement. The College's previous activities in fulfillment of the ACUPCC include the completion of the College's first broad greenhouse gas emissions inventory in fall 2008. This inventory built upon the ground-breaking work of a group of students who were the first to suggest an emissions inventory, to encourage Pomona College President David Oxtoby to sign the ACUPCC, and to press for climate action on campus.

The purposes of this report are the following:

- Discuss the College's approach to climate change action and emissions reduction;
- Provide detailed explanation of carbon emissions inventory and targeted sources;
- Establish proposed target dates for neutralizing targeted sources of carbon emissions;
- Identify opportunities the College may take in reducing emissions;
- Identify how the College has and will continue to incorporate issues of climate, environment, and sustainability in curriculum, research, and other educational opportunities;
- Propose a means for tracking progress; and,
- Identify possible financial mechanisms for funding actions.

This Climate Action Plan has been generated as part of a broader Sustainability Action Plan (SAP) process. This process started in fall 2008 and will end with the presentation of a final report to the Facilities and Environment Committee of the Board of Trustees in May 2010. The Sustainability Action Plan will consider goals and opportunities for action in a variety of environmental topics including energy, water, waste, purchasing, outreach and education, and environmental justice.

Process

This Climate Action Plan was produced through a process that elicited input from a wide variety of campus stakeholders, including students, staff, faculty, and trustees. This process gave the college community a chance to voice their concerns, ideas, and priorities. The following events, groups, and programs played a key role in the development of this Plan:

- >> **Campus Sustainability Audit** This 900-page report was completed in October 2008 and included the College's first comprehensive carbon emissions audit, an assessment of a variety of other environmental impacts generated by the College, and some initial findings and recommendations for potential actions.
- >> **President's Advisory Committee on Sustainability (PACS)** This committee of faculty, staff, and students provides oversight on the College's sustainability-related efforts, including this Plan. The committee discussed many of the issues included below in the "Planning Principles" section and brainstormed and assessed many of the actions described in this plan. PACS will continue to have primary oversight for implementation of this Plan as well as assessment of progress.
- >> **Sustainability Action Fellowship** This group of 29 students was formed to conduct research and to provide assessment for this Plan and for the upcoming Sustainability Action Plan. Through 2008-09, teams of three to six students focused on issues including energy, transportation, water, waste, purchasing, education and communication, and environmental justice.

Introduction

- >> **Facilities and Campus Services** Pomona's Facilities and Campus Services staff (including Maintenance, Housekeeping, Grounds, Planning and Project Management, and the Sustainability Integration Office) provided valuable input on the feasibility of a variety of actions and will continue to be the primary focus of project implementation. Staff members from these offices serve on PACS and were interviewed by Sustainability Action Fellows.
- >> **Trustee Sustainability Task Force** The Board of Trustees designated a Sustainability Task Force for the 2008-09 academic year to discuss sustainability-related issues and to update the College's Statement of Environmental Policy (see Appendix A). This Task Force included trustees, students, staff, and faculty and provided a variety of general input for planning principles and College priorities. The task force discussed the College's values and principles in moving forward with sustainability planning, and explored a variety of actions the College could take.
- >> **Public workshops and presentations** The Director of the Sustainability Integration Office (then the Sustainability Coordinator) and the Sustainability Action Fellows conducted a series of public workshops, presentations, and outreach opportunities in order to provide the campus community with information and to solicit input. Events included:
 - Two presentations of findings from the Campus Sustainability Audit
 - Input solicitations during meals at dining halls
 - Lunchtime presentation of carbon emissions inventory and long-range emissions projection
 - A series of "study breaks" with faculty and students to discuss possible actions the College could take
- >> **Trustee-Faculty Retreat** Every two years, College faculty and trustees participate in a three-day retreat to discuss priority issues. In 2009, this retreat was focused on sustainability and featured high profile speakers, film screenings, and small-group discussions of specific campus-related sustainability issues (e.g. student activism, curriculum, campus facilities, transportation). This Plan includes several ideas from the retreat.

A detailed list of participants and acknowledgements can be found in Appendix B.

This Climate Action Plan and the encompassing Sustainability Action Plan process are influenced by hundreds of hours of conversations among students, staff, faculty, and trustees. As a result of the community's conversation, the following principles for the College's commitment to sustainability have been established:

1. Prioritization of efforts

In order to emphasize personal responsibility and stewardship, educational opportunities, and the other sustainability values listed in the College's Environmental Policy (see Appendix A), the College plans to take action on environmental issues with the following priorities:

- Conservation (behavior and elimination of use)
- Efficiency (technology improvements)
- Renewables (purchase and development of alternative energy sources)
- Offsets (third-party or off-campus offsetting of emissions).

Prioritizing conservation and efficiency emphasizes educational and behavior-modifying opportunities, which the College views as central to its sustainability goals and a means of extending positive influence beyond campus and into the rest of the world. Conservation and efficiency efforts reduce energy and other resources used by the college, eliminating need for relatively less cost-effective renewable energy technology (the production of which inevitably uses some resources and generates greenhouse gases). Offsets are discussed below.

2. Purchases of offsets

The College does not plan to purchase offsets. While offset purchases may be necessary eventually to "neutralize" all sources of carbon emissions, the College is committed to prioritizing behavior modification, conservation, efficiency, and renewable sources as methods of emissions reduction. These methods provide opportunities to increase awareness, change behavior, and invest in innovative new technologies, while offsets must be purchased annually and send the message that our negative environmental impacts can be "bought away." Also, the offset market is relatively new, and the College does not see them as a reliable and proven method of reducing global emissions. With time and further development of the offset market, the College may consider purchasing offsets in the future. If offsets are purchased, the College will prioritize options that provide demonstrable benefit to localized communities. The College will also explore opportunities for "local carbon offsets," meaning investments of time, money, and/or effort that directly reduce the carbon emissions of other community entities (for instance, training students to engage in efficiency upgrades for local homeowners).

3. Use of "carbon neutrality"

While "carbon neutrality" has become a common term when talking about climate change, this term is often used in a misleading way. Because there are currently no tools available to sufficiently measure the entirety of emissions caused by any entity, understanding complete "neutrality" is impossible. For instance, we have no way of determining the emissions for the thousands of items purchased by the College every year. Without a more accurate inventory, it is impossible to determine what "carbon neutrality" means or to use it as a planning goal. The use of such a concrete term can mislead an institution and its community by implying that complete elimination of their negative environmental

Planning Principles

impacts is achievable by fully implementing their Climate Action Plan.

While many institutions have admitted that neutrality is more of an aspirational than literal goal, we are committed to exploring our options comprehensively and to determining possible reduction or neutralization goals for specific categories of emissions.

4. Sustainability Action Plan

While climate change is one of the world's most pressing environmental issues, the College believes it is extremely important to engage in comprehensive analysis and planning that incorporates a broader array of environmental issues, including water, waste, and environmental justice, among many others. To do this, the College is currently engaged in a broad sustainability planning process, of which this Climate Action Plan will be only a small part. The Sustainability Action Plan will be completed by May 2010.

5. Ongoing assessment

Ongoing monitoring and assessment is integral to the planning process and to making progress on our sustainability goals. To that end, the College is committed to:

- Producing a Sustainability Annual Report that tracks progress on selected indicators and that compiles current and planned efforts in a variety of categories.
- Updating our greenhouse gas emissions inventory annually to track reductions and increases in emissions.
- Updating our Sustainability Action Plan (including our Climate Action Plan) every three years to incorporate changes in programs, projects, and progress.

Climate Action Plan Inventory

Based on the College's emissions inventory for the 2007-08 academic year, this report takes the following inventory into consideration to develop plans for carbon emissions reduction:

Figure 1. CAP Carbon Emissions Inventory, 2007-08

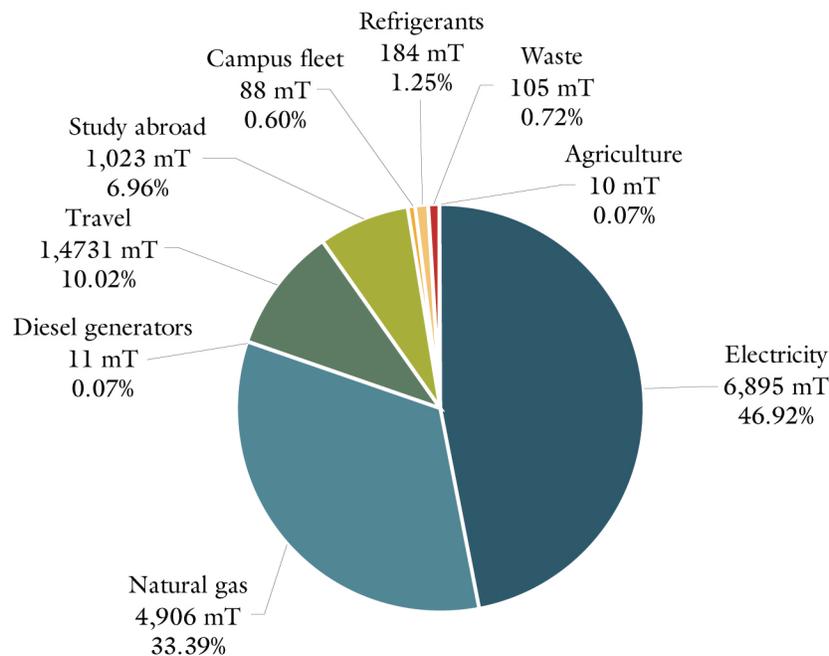


Table 1. Climate Action Plan Carbon Emissions Inventory, 2007-08

Source	Emissions (<i>mTCO₂e</i>)	Includes
Electricity	6,895	Purchased electricity
Natural gas	4,906	Purchased natural gas for water/space heating and cooking
Diesel generators	11	Use of diesel generators for emergency power
Travel	1,473	Air and road travel funded by the College
Study abroad	1,023	Air travel to/from study abroad programs
Campus fleet	88	Use of campus owned gas vehicles (not electric carts)
Refrigerants	184	Refrigerants used in HVAC, ice machines, etc.
Waste	105	Emissions from solid waste in landfill
Agriculture	10	Emissions from fertilizer use and chickens (3) at Farm
TOTAL	14,695 <i>mTCO₂e</i>	

The above inventory includes the sources of emissions that are:

- (1) directly caused by the decisions and actions taken by the College, for which the institution has a responsibility to engage in mitigation; and
- (2) measurable with fairly reliable tools and methods.

Carbon Inventory

Full Inventory

The following figure depicts a broader inventory of emission sources for which data is available. Categories not considered in this report are highlighted.

Figure 2. Full Carbon Emissions Inventory, 2007-08

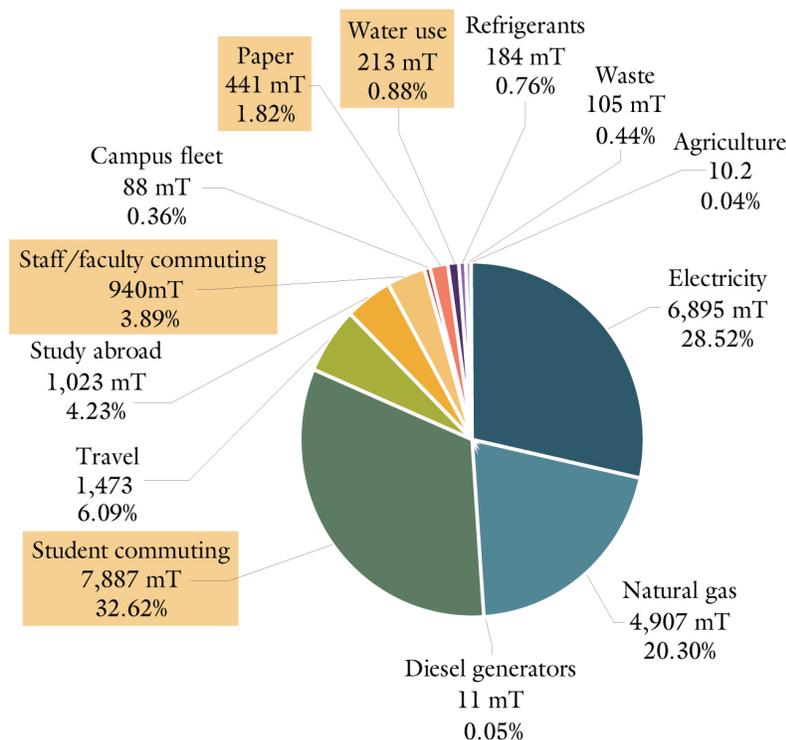


Table 2. Full Carbon Emissions Inventory, 2007-08

Source	Emissions (mTCO ₂ e)	Includes
Electricity	6,895	Purchased electricity
Natural gas	4,906	Purchased natural gas for water/space heating and cooking
Diesel generators	11	Use of diesel generators for emergency power
Student commuting	7,887	Students traveling back and forth to campus each year
Travel	1,473	Air and road travel funded by the College
Study abroad	1,023	Air travel to/from study abroad programs
Sta/fac commuting	910	Daily trips to and from campus for work
Campus fleet	88	Use of campus owned gas vehicles (not electric carts)
Paper	441	Production of paper purchased by the College
Water use	213	Pumping and treatment of water used by the College
Refrigerants	184	Refrigerants used in HVAC, ice machines, etc.
Waste	105	Emissions from solid waste in landfill
Agriculture	10	Emissions from fertilizer use and chickens (3) at Farm
TOTAL	23,236	

Carbon Inventory

The CAP Inventory excludes certain categories of emissions when one or more of the following applies:

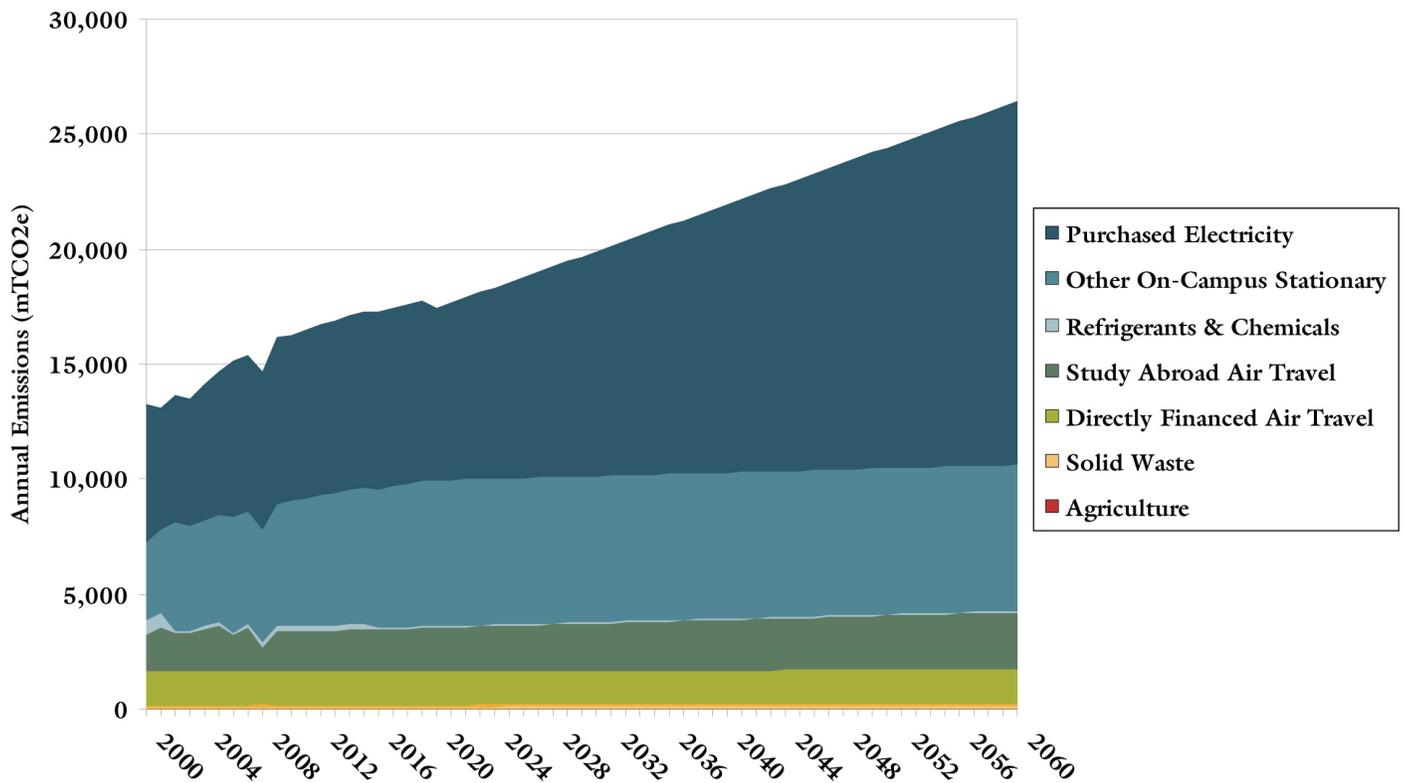
- >> **Considering this source of emissions falsely shifts responsibility away from responsible decision-makers and onto the College.** For instance, the College does not believe it should be responsible for the emissions that result from commuting decisions of staff and faculty. The College engages in programs and activities to reduce these emissions and will continue to do so and expand these efforts, but believes that individual commuters should take the responsibility for these emissions. In this instance, purchasing offsets for commuting could actually encourage actions with negative impacts. For example, a staff or faculty member could move farther away, assuming that the College would purchase offsets for their resulting emissions.
- >> **Methods of measuring/assessing these emissions are unreliable or underdeveloped.** For instance, paper was recently added as a category of emissions in the Clean Air-Cool Planet calculator. As we better understand how to measure consumption of goods, we will include these categories in our CAP inventory.
- >> **It is unclear how to determine responsibility for emissions.** For instance, water transmission and treatment require large amounts of energy for pumping and other processes. While we have an estimate of the energy and emissions caused by our water use, there no well-developed protocol for establishing responsibility for these emissions. Water conservation is a large part of the College's sustainability effort, but methods of transmitting and treating water are out of the College's control. (In this case, the tools for establishing these numbers are also newly developing and somewhat unreliable.)

As understanding of climate change and how to measure emissions develops, carbon inventories will expand and change. The College looks forward to expanding our inventory as we better understand how to measure the emissions and other environmental impacts of our activities. We also anticipate that climate change leaders will develop more specific protocols for allocating emissions between various parties. Until we are better able to assess our full range of emissions, we will consider a specific section of our carbon inventory for planning purposes.

Emissions Projection

Using the projection module of the Clean Air-Cool Planet calculator¹ (the predominant tool used by Colleges and Universities for measuring and analyzing emissions), the College’s projected emissions through 2060 are as follows:

Figure 3. Projected Growth of CAP Emissions Inventory, 2000-2060



The following table describes projected emissions from various categories in 10-year increments starting in 2010, along with the change from the previous decade. As the graph above shows, increases in use of purchased electricity (part of the energy category below) contribute the vast majority of growth in emissions.

Table 3. Change in Emissions Categories, 2000-2006

Year	Energy	Transportation	Refrigerants	Solid waste	Agriculture					
2010*	12,644.9	7.0%	3,284.8	26.1%	237.8	29.1%	104.1	-1.0%	9.9	-3.2%
2020	13,829.7	9.4%	3,451.2	5.1%	66.7	-72.0%	105.6	1.4%	11.6	17.4%
2030	15,912.7	15.1%	3,617.6	4.8%	66.7	0.0%	107.1	1.4%	12.8	10.8%
2040	17,995.8	13.1%	3,784.0	4.6%	66.7	0.0%	108.6	1.4%	13.6	6.0%
2050	20,078.8	11.6%	3,950.4	4.4%	66.7	0.0%	110.1	1.4%	13.9	2.2%
2060	22,161.8	10.4%	4,116.8	4.2%	66.7	0.0%	111.6	1.4%	13.7	-1.2%

* Change from 2008

1 Clean Air - Cool Planet. (2009). Downloaded from <http://www.cleanair-coolplanet.org/>.

Projection Factors

This projection incorporates the following factors:

- >> **Past trends in energy use and other impacts** For instance, since 2000 the College’s energy use has grown an average of five percent per year and energy use per square-foot has grown an average of two percent, and this projection considers that trend into the future. It is impossible to assess the specific reasons for this growth, but they almost certainly include:
 - Overall increase in square-footage
 - Increase in conditioned square-footage
 - “Load creep” – gradual increases in building load due to additional building users and additional devices and equipment plugged into outlets
 - Decreased building and equipment efficiency
- >> **New construction and renovation** Pomona College has pursued an aggressive renovation and construction plan for a number of years and intends to continue pursuing growth and development in accordance with the College’s Land Use Plan. This document outlines development for the planned Arts District, International Center, South Campus Athletic Field, and new residence halls. Other buildings, such as Millikan Hall, are likely candidates for renovation or demolition and new construction but are not yet detailed as part of this Plan.

The above emissions projection includes the following estimates of planned development²:

Table 4. Included Growth Estimates

Project	Additional sq-ft
North Campus Residence Hall	88,000
North Campus Parking Structure	76,000
South Campus Athletic Field	200,000
Music (Thatcher plus)	15,000
Museum, Art History, Media Studies	50,000
Bridges Auditorium	5,000
Studio Arts	35,000
Seaver Theatre	35,000
International Center	50,000
Additional Housing	70,000
TOTAL	640,000

These numbers detail additional area only, and do not include renovated space. Additional development and redevelopment will occur, but is not yet detailed.

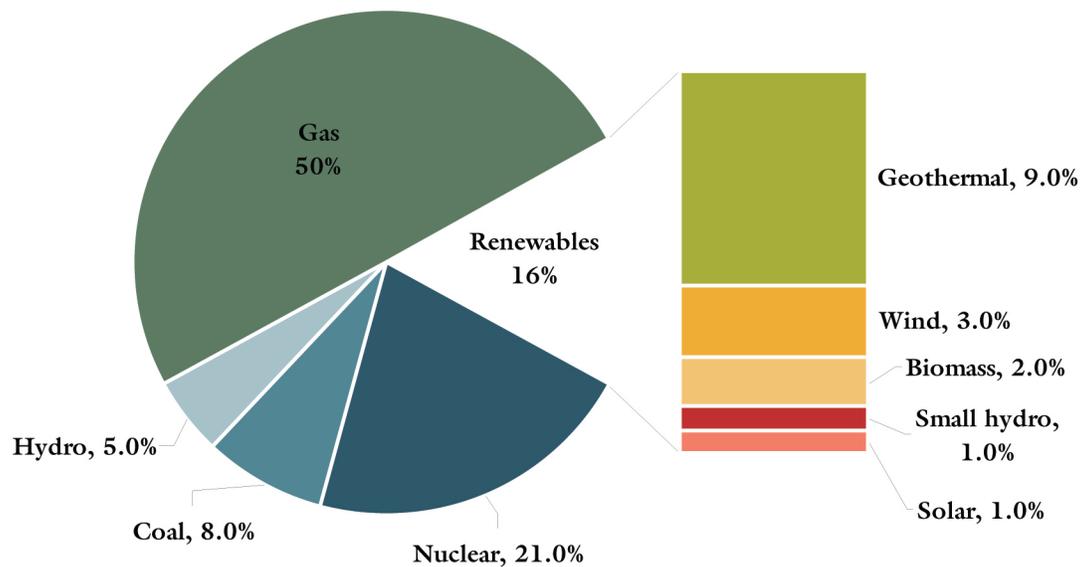
- >> **Staff/Faculty and Student Increases** This projection takes into consideration a gradual 10 percent increase in staff, faculty, and students over the next 10 years, based on stated administration goals and the assumptions of the Land Use Master Plan.³

2 Sasaki Associates. (2009). Pomona College Land Use Plan; Personal conversation with N. Scott Smith, Sasaki Associates, Pomona College Master Planner.
 3 Personal conversation with N. Scott Smith, Sasaki Associates, Pomona College Master Planner.

Emissions Projection

- >> **Renewable Portfolio Standards** This emissions inventory incorporates the current energy source portfolio of Southern California Edison, the College’s source of electricity. This portfolio is as follows⁴:

Figure 4. SCE Energy Sources Portfolio, 2007-08



The emissions projection in this report incorporates the State of California’s Renewables Portfolio Standard, which requires electricity providers (e.g. Southern California Edison) to increase procurement from renewable energy sources until reaching 20 percent by 2010 and with a target of 33 percent by 2030.⁵

Projection Limitations

The projection module of the Clean Air-Cool Planet calculator is the most comprehensive tool available for estimating future emissions, though its limitations are numerous. The following conditions limit the model’s accuracy:

- >> The projection tool considers added square-footage with “typical” energy efficiencies. Efficiencies are almost certain to increase from current levels, as buildings incorporate more modern equipment and as efficiency policies, such as Title 24 (California Building Standards Code), place changing requirements on development. The College is also likely to establish its own efficiency standards for sustainability-related reasons, which could drastically alter future energy use.
- >> This projection also does not incorporate gradual changes in behavior or resource use that come along with market or technological changes (e.g. rising energy costs) or outreach programs and increasing awareness.
- >> This projection model assumes continuous, stable increases in renewable sources through Southern California Edison, though progress is unlikely to take this path. It also assumes that these increases will stop in 2030, which is very unlikely.

⁴ Personal conversation with Southern California Edison representative.

⁵ California Public Utilities Commission. (2008). *California Renewables Portfolio Standard*. Accessed August 11, 2009 at <http://www.cpuc.ca.gov/PUC/energy/Renewables/>.

Other climate commitments

The following table describes the current climate commitments of a variety of other peer institutions⁶:

Table 5. Emissions Reduction Commitments of Various Institutions

Institution	Commitment
Bowdoin	- 11% below 2002 baseline by 2010
Cornell	- 7% below 1990 baseline by 2008
Harvard	- 30% below 2006 baseline by 2016
Middlebury	- 8% below 1990 baseline by 2012, on a per student basis - 100% below (“neutrality”) by 2016
Tufts	- 7% below 1990 baseline by 2012
Williams	- 10% below 1990 levels by 2020
Yale	- 43% below 2005 baseline by 2020
UC Berkeley	- Reduce to 1990 baseline by 2014
UC System	- Reduce to 2000 baseline by 2010 - Reduce to 1990 baseline by 2020 - 80% below 1990 baseline by 2050

AB32

In June 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05, which established the following greenhouse gas emissions goals for the entire state⁷:

- Reduce emissions to 2000 levels by 2010
- Reduce emissions to 1990 levels by 2020
- Reduce emissions 80% below 1990 levels by 2050

Assembly Bill 32, passed by the state legislature in August 2006, codifies into law the second of these targets. The mechanisms for enforcement and implementation of this law are currently in development.

City of Claremont

The City of Claremont passed its Sustainable City Plan⁸ in October 2008. The current version of this plan does not specify quantitative reduction goals, but the City intends to develop these targets further with future versions of the Plan.

6 AASHE. (2009). *Campus Global Warming Commitments*. Accessed August 11, 2009 at http://www.aashe.org/resources/gw_commitments.php.

7 California Air Resources Board. (2009). *Assembly Bill 32: Global Warming Solutions Act*. Accessed August 11, 2009 at <http://www.arb.ca.gov/cc/ab32/ab32.htm>.

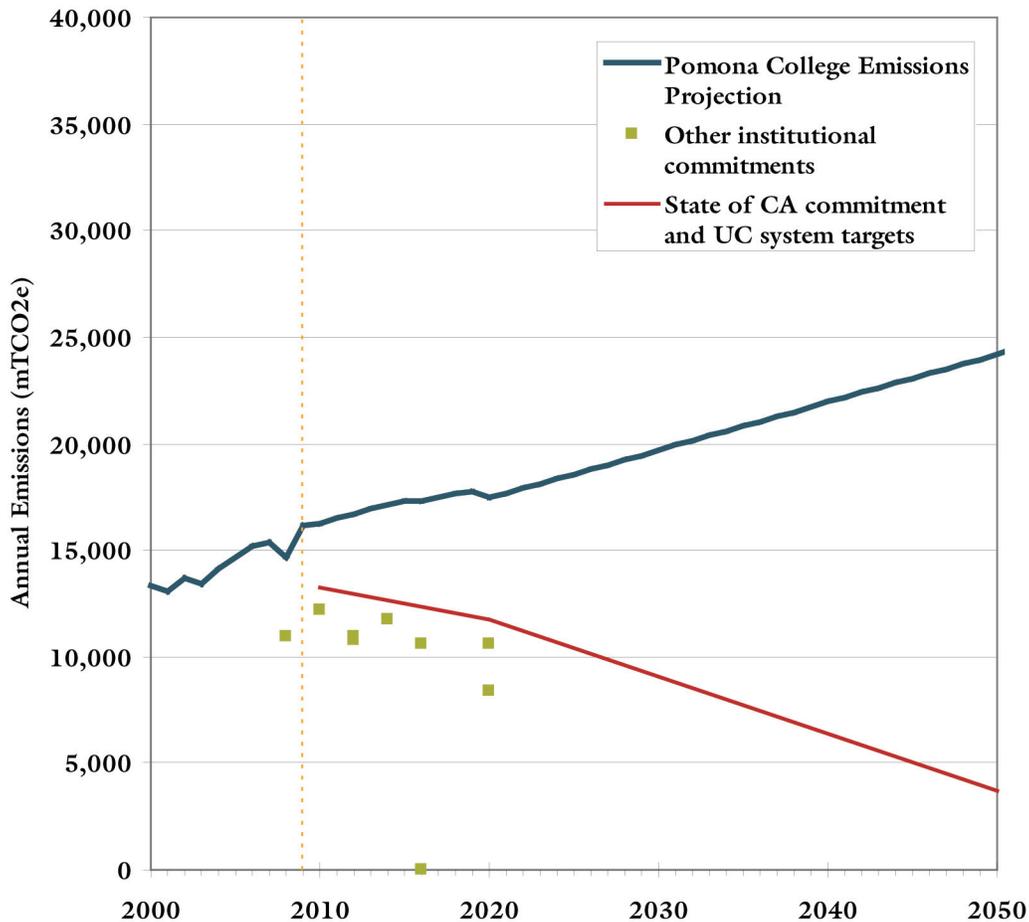
8 City of Claremont. (2009). *Sustainable City Plan*. Accessed August 18, 2009 at <http://www.ci.claremont.ca.us/download.cfm?ID=25654>

Emissions Targets

Comparison

The following graph depicts these commitments in relation to Pomona's climate projection:

Figure 5. Pomona Emissions Projection vs. California and Other Institutional Targets



Recommended Targets

The College recognizes the leadership of the State of California in its establishment of carbon reduction goals, and this report explores what it would take for the College to meet at least these standards for emissions reduction in the source categories considered in this report. The Clean Air-Cool Planet calculator has estimated the College's 2000 emissions at approximately 90% of current emissions and we have estimated 1990 emissions at approximately 80% of current emissions.

To match the state's goals, the College would need to see:

- 10% reduction in emissions by 2010
- 20% reduction by 2020
- 75% reduction by 2050

Meeting the 2010 standard is extremely unlikely at this point, but the 2020 and 2050 goals provide a sufficient timeline for planning. This report recommends these goals to the Board of Trustees these goals, to be achieved without the purchase of offsets or renewable energy certificates. Further reductions, including neutralization of these emissions sources, would be possible with the purchase of offsets.

Emissions Targets

Guidelines for progress

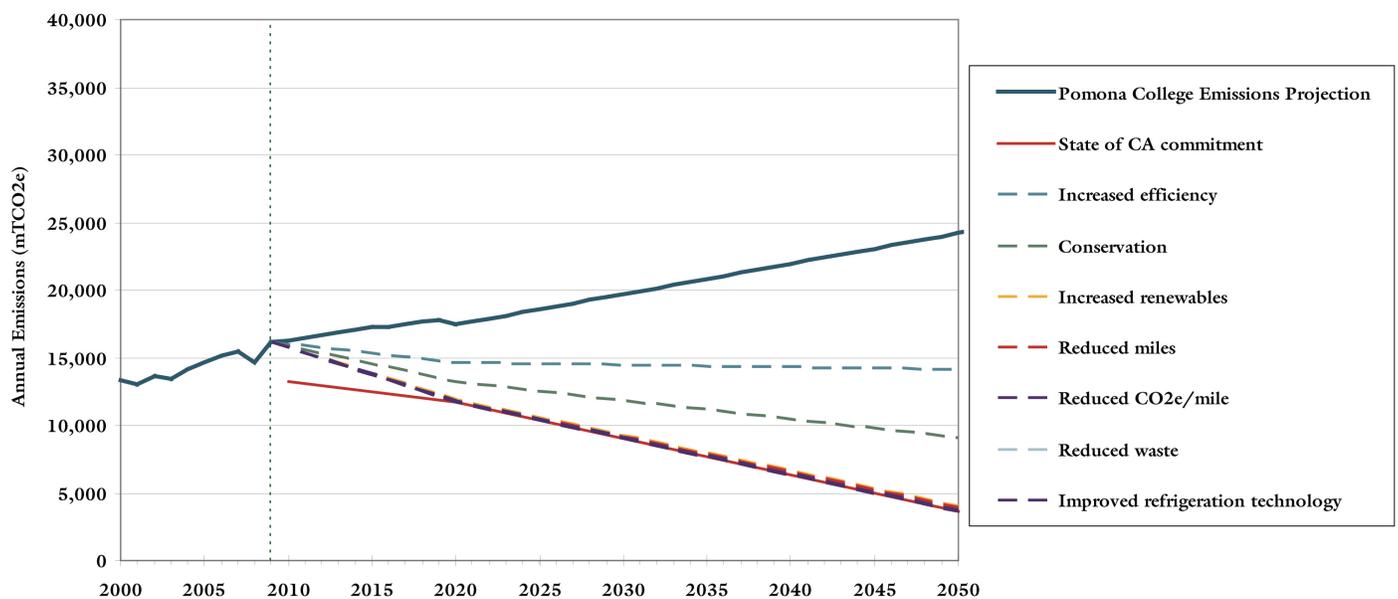
Meeting these goals would require a concerted effort to reduce emissions in a variety of ways. This report explores what actions would be necessary to achieve these goals, and has established the following guidelines for action. These guidelines were determined with understanding and analysis of current strengths, weaknesses, and opportunities of the College’s facilities, operations, programs, and projects.

Table 6. Recommended Progress to Meet Recommended Goals

	2010-2020	2021-2050
Energy use	<i>Reductions of energy use emissions from 2007-08 baseline:</i> 20% reduction from efficiency 10% reduction from conservation 10% reduction from renewables	<i>Reductions of energy use emissions from 2007-08 emissions:</i> 50% reduction from efficiency 25% reduction from conservation 25% reduction from renewables
Transportation	<i>Reductions of transportation emissions from 2007-08 baseline:</i> 5% reduction from reduced miles traveled 2.5% reduction from reduced emissions	<i>Reductions of transportation emissions from 2007-08 baseline:</i> 10% reduction from reduced miles traveled 10% reduction from reduced emissions
Refrigeration	<i>Reductions of refrigeration emissions from 2007-08 baseline:</i> Reduction from decreased energy use 25% reduction from new technologies	
Solid waste	<i>Reductions of waste emissions from 2007-08 baseline:</i> 25% reduction from reduced waste	<i>Reductions of waste emissions from 2007-08 baseline:</i> 50% reduction from reduced waste

The following graph depicts how these incremental reductions will affect total emissions in order to meet these recommended goals:

Figure 6. Recommended Progress Compared to Recommended Goals



Actions

Our analysis and campus-wide discussions have identified the following potential steps toward reducing emissions in the categories of energy use, transportation, and other emission-generating activities.

Note that these actions address only the emissions included in the scope of this report. The upcoming Sustainability Action Plan will consider all sources of emissions and a wide variety of other sustainability-related issues (e.g. water use, waste generation); this report focuses on reducing and neutralizing a particular set of emission sources.

Energy

Energy use is at the forefront of any discussion about environmental issues, sustainability, and climate change. Like many other institutions, energy use constitutes Pomona College's largest (80.3%) and most direct contribution of carbon emissions:

- Purchased electricity: 46.8% of emissions
- Natural gas boilers: 33.3%
- Diesel generators: 0.1%

Reducing the emissions contributed by energy use incorporates four distinct goals, prioritized as follows:

- Goal 1: Reduced energy use (conservation)
- Goal 2: Increased technological and building efficiency
- Goal 3: Increased renewable sources of energy
- Goal 4: Improved assessment of energy use

Note: The terms "conservation" and "efficiency" can sometimes be confusing. In this report, "conservation" refers to specifically eliminating or reducing the use of a "product"; for instance, choosing not to drive to the store, choosing to turn off the lights, or choosing to turn up the thermostat to reduce air conditioning (in this case "product" being cooling). In contrast, "efficiency" refers to an action or technology that brings the same "product" with less impact; for instance, driving a fuel-efficient vehicle, replacing an incandescent lamp with a fluorescent lamp, or installing an HVAC system that uses less energy to deliver cooling.

Goal 1: Reduced use (conservation)

- >> **Expand outreach efforts for behavior modification** Changing behavior among the campus community is one of the most important and least capital-intensive means of reducing the College's energy use and emissions. Current and planned outreach activities include: staff-faculty and student e-newsletters with information on how to reduce energy use in residence halls, classroom buildings, and offices; a green living guide with information and tips on reducing energy use while working, living, and playing on-campus, distributed to all staff, faculty, and students; a green office program that "certifies" offices and departments for engaging in specific energy-friendly behaviors; energy competitions between residence halls and academic buildings; and much more.
- >> **Provide "tools" for reduction of use** The Sustainability Integration Office currently offers a variety of items to help students, staff, and faculty reduce their energy use on campus. Laundry drying racks and CFL bulbs are the first items available for free use, but the Office plans to expand this program to offer other tools for energy conservation.
- >> **Provide information about use and reductions** The Sustainability Integration Office plans to expand the use of data and information to increase awareness of energy use (along with other environmental impacts). This includes the distribution via newsletter, emails, and flyers of monthly

utility data including use and cost to all building occupants, as well as the incorporation of “building dashboard” real-time monitoring systems across campus as buildings are renovated or constructed.

- >> **Assess opportunities to remove/reduce system uses through conservation** Numerous conservation projects are planned or being implemented, including the removal of unnecessary light fixtures and analysis of opportunities to change HVAC setpoints. We could also assess computers, laboratory equipment, and other equipment for use of “sleep modes” and other energy-saving measures.
- >> **Analyze alternatives for diesel generators** The College’s diesel generators are used any time normal electricity service is unavailable. Better alternatives could include gas-fired microturbines or self-sufficiency through off-grid renewable sources.

Goal 2: Increased efficiency

- >> **Implement various energy efficiency retrofits and projects** Updating building systems and equipment is an effective means of reducing energy use, though it can be expensive. Opportunities should be assessed for return on investment and feasibility. The 2008 Campus Sustainability Audit identified a number of potential projects, including lighting retrofits that would save over \$67,000 annually in electricity savings. Other projects include equipment-related retrofits, such as lighting and HVAC upgrades, as well as alternative energy-saving strategies, such as landscaping to shade south-facing building facades and the use of natural ventilation to cool and ventilate spaces.
- >> **Perform energy audits on targeted buildings** While the 2008 Campus Sustainability Audit identified many potential efficiency retrofits, the College still has more to learn, particularly concerning HVAC and other related building systems. The College should perform an integrated energy and performance audit on specific buildings (if not the entire campus) and choose a threshold at which recommendations will be implemented. This report recommends that the College immediately take on any recommendations with payback periods of equal to or less than two years, though agreement on this threshold is needed. Larger projects should be considered based on internal rate of return and as an investment of College funds.
- >> **Engage in retro-commissioning or monitoring-based commissioning for all buildings on campus** Retro-commissioning and monitoring-based commissioning identify opportunities for efficiency upgrades by collecting a wide array of data and information about the performance of the building. Just as commissioning ensures that a new building and its systems perform as designed, retro- or monitoring-based commissioning provide either one-time or continual monitoring (respectively) of key aspects of the building’s systems in order to identify equipment or procedures that are not occurring as intended. For instance, the process might monitor the speed of an intake fan on an HVAC system to assess whether it is working as intended and scheduled appropriately for the occupancy schedule of the building. Conditioned spaces should be considered first.
- >> **Develop and abide by Green Building Standards** The College will update its Green Building standards to incorporate efficiency requirements. These requirements will include standards for new construction as well as retrofits and upgrades for renovations, redesigns, and remodels. These standards could take a variety of forms, which could be chosen individually or together, including:
 - Specific reductions from code* For instance, the College could require that buildings reduce energy use by a certain percentage below Title 24 standards, with the percentage likely based on the specific use of the space (e.g. athletic, academic, residential, laboratory, etc.).

Actions

Example: Ohio State University's new Green Build and Energy Policy stipulates⁹ energy use reductions for specific types of buildings, including the following:

- Every classroom and administrative building construction project will achieve energy efficiency that is 25% above ASHRAE 90.1 2004 standards (guidelines for energy use in buildings).
- Every dorm construction project will achieve energy efficiency that is 30% above ASHRAE 90.1 2004 standards.
- Every athletics and recreation construction project will achieve energy efficiency that is 20% above ASHRAE 90.1 2004 standards.
- Every lab construction project will achieve energy efficiency that is 20% above ASHRAE 90.1 2004 standards.

Specific reductions from current use The College could commit to reductions relative to current building performance. The most notable example of this would be to partake in the Architecture 2030 Challenge,¹⁰ which sets the following goals for the greenhouse gas emissions of new buildings and major renovations:

- 50 percent reduction over regional average for that building type
- 60 percent reduction in 2010
- 70 percent reduction in 2015
- 80 percent reduction in 2020
- 90 percent reduction in 2025
- Carbon-neutral in 2030 (using no fossil fuel or greenhouse gas emitting energy used to operate the building)

Required levels of certification

LEED Standards For instance, the College could require that all construction projects meet particular certification standards for the relevant LEED system, including LEED for Operations and Maintenance, New Construction, and Commercial Interiors. The College could require that the buildings actually become certified or that they are built to LEED standards without being certified. Certifying to certain levels (e.g. Silver, Gold, Platinum) assumes a certain level of energy efficiency, though reductions are not specified. This report recommends requiring a minimum of Gold certification if this option is chosen.

EnergyStar Scores The federal EnergyStar program¹¹ provides a set of energy efficiency standards and performance measurement tools for commercial buildings, dormitories, and other similar types of buildings. The College could require that all buildings - including existing facilities - perform to a certain EnergyStar score.

End-load requirements In this case, the College would set an energy "budget" for each building and engage in a design and retrofit process to meet that goal.

9 Ohio State University Institute for Energy and the Environment. (2009). *Interim Green Building and Energy Policy*. Accessed August 11, 2009 at [http://busfin.osu.edu/FileStore/310 InterimGreenBuildandEnergy.pdf](http://busfin.osu.edu/FileStore/310%20InterimGreenBuildandEnergy.pdf).

10 Architecture 2030. (2009). *Architecture 2030*. Accessed August 11, 2009 at <http://www.architecture2030.org/>.

11 U.S. EPA. (2009) *EnergyStar*. Accessed August 18, 2009 at http://www.energystar.gov/index.cfm?c=business.bus_index.

Labs21 requirements for laboratory facilities The federal Labs21 program provides assistance and guidelines for energy efficient laboratory facilities.¹² The College should participate in this program for every laboratory space developed on campus.

- >> **Work with utility rebate and incentive programs on all design projects** Southern California Edison (electricity) and Southern California Gas Company (natural gas) provide a variety of financial incentives and technical support for energy efficiency projects, ranging from simple technology replacement (e.g. light fixture upgrades) to design assistance for renovations and new construction (otherwise known as the Savings By Design program). The College should commit to engaging with these utilities from the beginning of every project to take advantage of their resources and to maximize financial benefit.

Goal 3: Increased renewable or alternative sources of energy (distributed energy sources)

Renewable energy sources provide means of generating energy – electricity or heat – from renewable natural sources such as solar, wind, or geothermal. Alternative energy refers to other opportunities to either produce energy in a more efficient and self-sufficient manner or to reclaim lost energy or heat generated through pre-existing equipment or sources. These are also referred to as “distributed energy sources,” that is, energy generated on-site rather than purchased from a utility.

Discussions about renewable energy in Southern California commonly focus on photovoltaic systems, which harness solar radiation to generate electricity. The College currently has two installed photovoltaic systems totaling 90.2kW—which generate electricity for approximately 4.0% of the College’s annual electricity load—and will be installing an approximately 80kW array on a new residence hall project currently under construction. This development will also include a solar hot water heating system that will use solar radiation to heat water for domestic uses (e.g. showers, laundry, faucets, etc.). Solar hot water heating, whether for domestic or other uses, is a far more cost-effective technology than PV (in terms of financial investment per dollar cost of energy use reduced, per unit of energy reduced, and per mTCO_{2e} reduced), and the College is now prioritizing this type of technology over photovoltaic.

- >> **Move forward with identified renewable energy projects** The College has identified a number of renewable projects that will hopefully be seen through to fruition. As mentioned above, the College’s new residence hall currently under construction will include an approximately 80kW photovoltaic system and a solar hot water system to cover almost 100 percent of the buildings’ domestic hot water needs. Additional projects include:

- Pendleton Pool and Haldeman Pool solar hot water heating systems
- Frank Dining Hall and Rains Athletic Center solar domestic hot water heating

The table below shows the proposed impacts of these projects.

Table 7. Potential Gas and Emissions Reductions from Planned Solar Hot Water Projects

Project	Gas reduction (<i>annually, MMBtu</i>)	Emissions reduction (<i>annually, mTCO_{2e}, based on 2008 emissions</i>)	% emissions reduction (<i>annually, from total 2008 emissions</i>)
Pendleton	2,170	115	0.78%
Haldeman	7,949	421	2.86%
Frank	462	24	0.16%
Rains	323	17	0.12%

12 U.S. EPA. (2009). *Labs 21*. Accessed August 11, 2009 at <http://www.labs21century.gov/>.

Actions

- >> **Conduct assessment of opportunities and financing options for renewable energy options** In order to move forward with renewable energy options, the College must conduct a comprehensive, campus-wide assessment of locations, technology options, and financing opportunities for a variety of technologies including solar photovoltaic, solar thermal hot water heating, wind, and ground-source geothermal. Because it may be difficult to find sufficient and cost-effective roof space for many of these systems on a building-by-building basis, the campus must be viewed as a whole and opportunities for centralized renewable sources must be discussed.
- >> **Prioritize opportunities for renewable energy sources in consideration and development of centralized heating and cooling** The College is currently assessing the need for and opportunities associated with the development of a centralized heating and cooling for South Campus and the planned Arts District. The Feasibility Report for this project¹³ determined that one central plant would most likely not reduce overall energy use, but that there are opportunities either to incorporate high levels of renewable energy within the central plant or to focus on building efficiency and distributed, decentralized plants. As decision-making continues, renewable energy sources and overall energy use should be a high priority.
- >> **Work with Edison to determine optimum pricing structure** Currently, the College partners with the other institutions of the Claremont University Consortium (Harvey Mudd College, Pitzer College, Scripps College, Claremont McKenna College, and Claremont Graduate University) for the purchase of electricity from Southern California Edison. The entire Consortium is priced as one customer, and is currently engaged in Edison's Base Interruptible Program. Our participation in this program results in a constant, discounted rate on electricity in exchange for volunteering to cut our load in the case of an electricity crisis ("brownout"). Unfortunately, this low rate and participating in this program result in reduced incentives or even disincentives for reducing energy use, and the College must continue working with the utility to determine pricing structures that meet Edison's and the College's shared goals for renewable energy generation.
- >> **Assess opportunities for alternative sources of energy** Technologies such as cogeneration, economizers, heat recovery systems, and microturbines provide alternative methods of generating or "recovering" energy that might otherwise be lost. For instance, a cogeneration system harnesses the heat that results from equipment that generates electricity, and uses that heat for some other useful purpose. At one time, the College used a cogeneration system to produce electricity and provide heating for Haldeman Pool; unfortunately this system was not appropriately designed or installed and is no longer operative. Economizers and heat recovery systems similarly make usable the heat generated by equipment such as boilers and condensers, and microturbines are small combustion turbines that burn a fuel to produce both electricity and heat. The College should assess opportunities for such technologies whether in new projects or upgrades on existing equipment.
- >> **Assess alternative options for fueling campus cart fleet** The College currently owns a fleet of 47 electric carts, which are used for transportation around campus. These cars are charged via outlet on a daily basis, but the College should assess opportunities to install solar photovoltaic panels on the carts themselves (e.g. <http://www.suncatchergolf.com>) or as a charging station.

13 CTG Energetics. (2009). *Pomona College Arts District Central Plan Feasibility Study - Phase 2: Comparison of Distributed vs. Central HVAC Plants and Alternative Energy Options.*

Goal 4: Improved assessment of energy use

- >> **Create full-time Energy Manager position to track energy use and coordinate reduction programs** The College does not currently have a position dedicated to tracking energy use and monitoring major loads with the technical expertise necessary to make building system recommendations. A full-time staff member would provide constant assessment of use and opportunities for increased efficiency and conservation. This person would work closely with the Sustainability Integration Office and other offices on campus to recommend programs and projects and identify funding sources.
- >> **Upgrade metering system** The College should install upgraded meters to better identify building-by-building use and real-time energy loads. Many buildings currently share electricity and/or gas meters, making it difficult to assess use over time and identify potential problems. These meters are also not capable of providing real-time energy load information, which makes it difficult to understand patterns of use on campus.

Transportation

The College's activities result in transportation miles in a number of ways, some of which are considered in this carbon inventory. Staff and faculty transportation includes travel for official College business including conferences and workshops, commuting to and from work every day, and research and academic projects. Student transportation includes travel for study abroad, research and academic projects, athletic events, commuting to campus for students who live off-campus, and going to and from campus from home every year. The College also owns a fleet of vehicles for official College business or activities.

The following transportation sources contributed 17.71% to the College's footprint in 2007-08:

- College-funded travel (e.g. conferences, research, meetings): 10.16%
- Study abroad: 6.95%
- Campus fleet 0.6%

Transportation miles not included in this inventory include:

- Staff and faculty commuting to and from work
- Student commuting to and from school
- Student travel to and from campus on a yearly basis

Reducing the emissions contributed by transportation incorporates two goals as follows:

- Goal 1: Reduced air and vehicle miles
- Goal 2: Reduced gasoline use/emissions

Goal 1: Reduced air and vehicle miles

- >> **Use video conferencing where possible** For instance, the Philosophy Department used video conferencing for one round of interviews when seeking candidates for a vacant faculty position. Video conferencing is also useful for viewing conference sessions and participating in meetings, when possible. Video conferencing technology is available at Cowart Information Technology building.

Actions

- >> **Expand use of Zipcar and the campus fleet for carpooling to events** The College's partnership with Zipcar car sharing (<http://www.zipcar.com>) makes nine highly fuel-efficient cars available on campus, and the campus' fleet of cars includes at least one hybrid and other fuel-efficient options. When staff, faculty, or students drive a group to events, Zipcar and the campus fleet can be used to reduce the number of cars on the road.
- >> **Advocate for improved local transportation connections** The College should explore opportunities to advocate for improved local public transportation, including communicating with local transit agencies to discuss improved schedules and connections. The City of Claremont is also interested in partnering with the College to make sure students are aware of local transportation options including Foothill Transit (bus) and Metrolink (commuter train).
- >> **Provide better information about local transit options** The College can provide more and better information to students, staff, and faculty about transit options. New employee and new student orientation materials should include this information, and the College's website should provide user-friendly pages with information about transit connections. Likewise, official College trips (particularly for activities such as Orientation Adventure and the Pomona College Internship Program) should continue emphasizing use of local trains and buses for regional transportation.
- >> **Improve bicycling programs** The College should continue providing funding, space, and support for bicycling programs, including the Green Bikes program (free bike rental and repair for students), On The Loose (free rental of mountain bikes for outdoor trips), the folding bikes fleet (six folding bikes available from various groups for free daily rental), and bike infrastructure (bike racks installed around campus). Expansions of these programs could include additional bikes for daily rental, improved information about local and regional bike trails and bicycling resources, and other outreach and events (such as "Bike to Work Day") that advocate for bicycling.
- >> **Assess opportunities to increase telecommuting and use of flexible work hours** The College should work through its Human Resources office to assess opportunities for telecommuting and flexible hours, which can cut down on daily commuting miles to campus.
- >> **Inform departments of their annual air and automobile miles** The Sustainability Integration Office should email departments with information about the impact of their travel and opportunities to reduce environmental impacts
- >> **Exploration of Zipcar incentives** The College is currently in discussion with Zipcar concerning opportunities to encourage Zipcar use, such as free memberships for residence hall staff who use the cars for residence hall business.
- >> **Develop programs to facilitate carpooling** The College is also currently in discussions to purchase or develop computer programs/websites to connect individuals for carpooling, whether for daily staff and faculty commuting or other travel (including students' annual trips back and forth to campus, spring break trips, internships, and other). Zimride (<http://zimride.com/>) is one potential option currently under consideration.

Goal 2: Reduced gasoline use/emissions

- >> **Purchase hybrids or other low-mileage vehicles for campus fleet** In purchasing new vehicles for the campus fleet, the Department purchasing the vehicle should prioritize fuel efficiency.

- >> **Use Zipcar and campus fleet as means of higher gas mileage** Because the campus fleet and Zipcar vehicles are generally fuel-efficient, use of these cars instead of private vehicles likely reduces carbon emissions from transportation.

Other Emissions Sources

Refrigerants

The College uses refrigerants for air conditioning and refrigeration (e.g. ice makers). In this inventory, refrigerants constitute 1.25 percent of emissions. These emissions will be mitigated in two ways:

- As air conditioning load is reduced, the College's need for refrigerants will decrease.
- In accordance with the Montreal Protocol and other policies, the College will naturally shift away from more harmful, emissions-causing refrigerants and chemicals and toward other alternatives.

Solid Waste

Solid waste emits greenhouse gases as it decomposes. Currently, the College sends its waste to a landfill that engages in methane harnessing (capturing landfill emissions to generate electricity), which results in drastically reduced greenhouse gas emissions. Waste contributes 0.71 percent to the inventory considered in this report. As the College engages in waste management to reduce the waste that goes to the landfill, this source of emissions will shrink. Current and planned actions to reduce landfill waste include:

- Efforts to reduce waste via reduced consumption
- Efforts to reduce food waste in dining facilities
- Increased use of composting for dining facilities and other food waste
- Increased purchase of compostable and recyclable materials
- Increased outreach about alternative waste options (e.g. recycling and composting)

Agriculture

The chickens at the on-campus Organic Farm and fertilizer use on College grounds provide a negligible amount of greenhouse gas emissions (0.07 percent of the inventory). The College values the chickens as an important part of the Farm's purpose and understands that the Farm provides a variety of carbon-offsetting activities (including plant cultivation and composting), so has no plans to focus on this source of emissions. Emissions from fertilizer use will naturally decrease as better products come on the market and as overall use decreases with decreased turf area.

Education and Awareness

Pomona College is dedicated to providing an educational, residential, and work environment that increases awareness of environmental issues and that encourages people to take an active role in reducing the College's impacts. It is difficult to assess the impacts of outreach, awareness, educational, and other related programs and opportunities; however, we hope that by providing more data, thought-provoking questions, critical dialogue, and other sources of information to the campus community, we will encourage self-assessment and modification of behavior, as well as a greater interest in seeking solutions to the world's environmental problems.

Currently, there is a wide variety of opportunities for the campus community to become engaged in sustainability-related issues, including courses, events, lectures, and workshops. From orientation programs for new first-year students and stickers on light switches to faculty research projects and course offerings, sustainability education on campus reaches a broad audience with different levels of commitment and knowledge. The College has a history of leadership in providing these programs and opportunities, and this leadership is evident in the growing number of Environmental Analysis (EA) majors, sustainability-related senior projects and theses, graduate degree programs, and career choices of Pomona alumni.

For a current list of programs, courses, and other educational offerings, see the College's Sustainability Annual Report at www.pomona.edu/sustainability.

Actions

The College seeks to incorporate sustainability into the educational environment in the following ways. These prioritized actions were chosen after analyzing a wide variety of activities, programs, and projects the College could be undertaking in the areas of outreach, communication, education, and research.

Actions are recommended in three areas:

- Area 1: Academic environment
- Area 2: Residential/work environment
- Area 3: Public/community engagement

Area 1: Academic environment

- >> **Move forward with plans to expand and develop the Environmental Analysis Program** The Claremont Colleges were recently awarded a \$1.5 million grant from the Andrew W. Mellon Foundation to further establish and develop the EA Program. This includes expanding the program to cover all of the Claremont Colleges, the hiring of new faculty in areas of particular interest (including climate science), grants for student research, and the development of new curricula.
- >> **Form a Sustainability in the Curriculum Task Force** This group could perform an analysis of currently offered courses related to sustainability issues and form recommendations of strengths, opportunities, and deficiencies in the current curricular offerings.
- >> **Continue to develop and offer an annual faculty development workshop** The Dean's Office should offer an annual or semi-annual curriculum development workshop for faculty. These workshops can help faculty to develop new courses, projects, and reading materials, facilitate cross-disciplinary connections, integrate local and global issues of sustainability into existing or new syllabi, and identify opportunities to connect coursework to local environmental programs, groups, and projects.

Education and Awareness

Other examples of such workshops include:

Table 8. Other Institutional Faculty Development Workshops

Institution	Commitment
Auburn University	Fall Line Project: Sustainability in the Curriculum
British Columbia Institute of Technology	Pacific Spirit Project Workshop
Carleton College	Cows, Colleges and Curriculum: Sustainability Issues in the Classroom
Dickinson College	Valley & Ridge Faculty Development Workshop
Emory University	The Piedmont Project
Ithaca College	Finger Lakes Project
Northern Arizona University	The Ponderosa Project
Santa Clara University	Penstemon Project
St. Olaf College	Cows, Colleges and Curriculum: Sustainability Issues in the Classroom
Tufts University	Tufts Environmental Literacy Institute (TELI) 2008
University of Idaho	Palouse Project
University of Massachusetts Boston	Sustainability Curriculum Development
University of Southern Maine	The Maine Watersheds Project
University of Wisconsin Oshkosh	The Winnebago Project

- >> **Provide project ideas to faculty** The Sustainability Integration Office should continue to generate lists of ideas for helpful academic projects (e.g. analysis of solar power potential on campus roofs, generation of campus outreach programs), which are then posted online and distributed to interested faculty and students.
- >> **Provide data for use in academic projects and syllabi** The Sustainability Integration Office should continue to create a database of campus sustainability data (for example, energy use by building) that could be used in academic projects and for coursework.
- >> **Explore opportunities to increase sustainability-focused study abroad programs** Sustainability is a global issue, and countries all over the world exhibit inspiring ways to reduce environmental impacts. A wider array of sustainability-related study abroad programs could increase students' exposure to both problems and solutions.
- >> **Increase use of local natural resources in curricula** The on-campus Organic Farm and the Bernard Field Station, along with many other local and regional natural areas, constitute invaluable educational resources for research, projects, and demonstrations. Opportunities to use these resources should be explored and information distributed to interested faculty.
- >> **Further develop of sustainability-related internship opportunities through PCIP program** The College's internship program already contains a variety of sustainability-related internship

Education and Awareness

opportunities, but the program should work with the EA Program to focus on opportunities that specifically provide students with skills to take into the job force.

- >> **Explore opportunities to incentivize sustainability-related research projects** The College should seek out opportunities to encourage sustainability-related research through the use of internal or external grants and other means of compensation or award.

Area 2: Residential/work environment

- >> **Include sustainability information in staff/faculty orientation** Information on why Pomona is dedicated to sustainability (including the College's Statement of Environmental Policy), what is expected of new staff and faculty (e.g. recycling guidelines), and opportunities to "work green" should be included in the orientation materials given to every new staff and faculty member.
- >> **Further develop outreach campaigns** The Sustainability Integration Office should continue to develop and administer outreach campaigns to staff, faculty, and students about reducing their environmental impacts on campus. These include newsletters, signage, and information about environmental impacts (e.g. monthly energy use in their residence hall or office building) and opportunities for reduction.
- >> **Continue coverage of sustainability programs, projects, and spotlights in internal communication** The staff newsletter, for instance, is an excellent outlet for distributing information to College employees. In the future, the newsletter should include a "spotlight" on particular offices or staff and faculty members engaged in sustainability-related behavior.

Area 3: Public/community engagement

- >> **Continue to explore opportunities to partner with the City of Claremont's sustainability programs** Claremont's Sustainable City Program provides opportunities for students, staff, and faculty to become engaged in the broader community's sustainability efforts. City leaders have expressed a desire to follow the College's lead in exploring projects and opportunities, and the Sustainability Integration Office will continue to work with the City's Planning Department and Sustainable Claremont to determine opportunities for partnership.
- >> **Develop a consortium sustainability committee** A consortium sustainability committee would allow for better communication and coordination across Claremont campuses. This would also allow the College to explore projects and programs that might be cost- or scale-prohibitive at an individual scale.
- >> **Discussion of sustainability in prospective student communication** The College should continue to highlight sustainability programs, projects, goals, and successes in printed materials, tours, visits, and other communication to prospective students. This not only showcases our program, but also communicates to prospective students that they will be expected to engage in our sustainability efforts.
- >> **Communicate sustainability programs during Alumni Weekend** "Green campus tours," presentations about programs, and constant signage and communication about the College's programs and projects during Alumni Weekend would give alumni a first-hand look at how Pomona is trying to reduce its impact and could positively affect alumni giving.

The ambitious actions included in this Plan require the participation of a large number of campus stakeholders, including students, faculty, trustees, and staff from across the campus and the community. As the College engages in the upcoming Sustainability Action Plan process, next steps and goals will develop further, along with responsibilities and guidelines for various offices, departments, and groups on campus. Suggested primary responsibilities for various efforts are outlined below.

Prioritized conservation, reduction, and awareness efforts

As described above on page 3, the College plans to pursue conservation and reduction efforts in the following prioritized manner:

- Conservation (behavior and elimination of use)
- Efficiency (technology improvements)
- Renewables (purchase of new energy sources)
- Offsets (third-party or off-campus offsetting of emissions)

The College seeks to emphasize the following values in outreach programs:

- Teaching sustainable lifestyle behaviors
- Providing marketable skills and training for future career opportunities
- Providing opportunities to engage in advanced academic and research projects

Further, the timeline and order for implementation of projects and programs will depend on the financial, staff, and other resources available at the time and the relative environmental, social, and financial costs and benefits of individual projects and programs. The variety of stakeholders below will work together through PACS to determine the prioritized order of major projects and programs.

Responsibilities

- Conservation efforts: Facilities and Campus Services (infrastructure); Sustainability Integration Office (behavior-modification)
- Efficiency and Renewable Energy: Facilities and Campus Services; Sustainability Integration Office
- Awareness: Sustainability Integration Office; Office of Campus Life

Ongoing Assessment

Assessment and evaluation is an important part of any institution's climate action plan. As described above, the College intends to track emissions and other sustainability issues by:

- Producing a Sustainability Annual Report that tracks progress on selected indicators and that compiles current and planned efforts in a variety of categories
- Updating the College's greenhouse gas emissions inventory annually to track reductions and increases in emissions
- Updating the College's Sustainability Action Plan (including our Climate Action Plan) every three years to incorporate changes in programs, projects, and progress

Responsibilities

- President's Advisory Committee on Sustainability (primary oversight)
- Sustainability Integration Office (compilation of data and reports for review by PACS)

Implementation

Data and Information Accessibility

Accessibility to information and data increases awareness of climate change and sustainability and engages the campus community in efforts to improve the College's environmental impacts. All annual emissions inventories will be kept in an easy-to-understand digital format to make information accessible to the campus community. This inventory, along with all plans, reports, and data, will be available on the Sustainability Integration Office's website for use in academic projects or for general interest. The Sustainability Integration Office will also conduct outreach to faculty and staff to make them aware of the availability of this data and information.

Responsibilities

- Sustainability Integration Office
- A variety of other offices are responsible for tracking and providing data – for example, the Athletics Department is responsible for tracking teams' travel miles for sporting events. The Sustainability Integration Office will coordinate shared data.

Outreach and Information

The wide array of projects and programs that will take place within this effort will require a large amount of ongoing outreach and dissemination of information so that the entire campus community is aware of the College's goals, efforts, and progress. This outreach and information effort should also provide the understanding, motivation, and acknowledgement necessary for participation and leadership.

Responsibilities

- Sustainability Integration Office
- Office of Campus Life
- Staff Council
- President's Advisory Committee on Sustainability

The recommended actions included in this plan represent significant financial costs and savings. Some projects will require large one-time financial outlays, while some are virtually cost-free. Likewise, some projects will provide large financial savings, whether immediate or incurred over time, and some will not provide any financial savings but perhaps some significant social or other non-financial benefits.

The College's financial accounting procedures are not currently structured to accurately assess the long-term costs and benefits of projects that span departments and financial accounts. Care must be taken to provide the organizational infrastructure necessary to accurately assess the financial impacts of projects. Likewise, the College needs to determine the threshold at which they will assess the long-term financial impacts of projects and programs and make implementation decisions.

The College faces a variety of financing opportunities, including the following categories of funding sources:

- >> **Dedicated funds** The College can budget specific funds each year to be used on related projects.
- >> **Revolving loan fund** As many other institutions are doing, the College could deposit savings from projects into a fund from which future proposals could be funded. This option would also require additional funding for projects that do not necessarily result in measurable savings, such as outreach programs.
- >> **Grants** The College can pursue public and private grants for programs and projects.
- >> **Dedicated development targets** The College can work with the Development Office to determine specific projects as targets for fundraising.
- >> **Third-party funding** The College can engage in partnerships with third-party companies to provide funding for design and installation of projects. Examples of this might include a company that funds an extensive lighting retrofit, with the College paying the company with a certain portion of the energy savings that ensue. Another example is a power purchasing agreement (commonly referred to as a "PPA"), in which an energy technology company (e.g. solar photovoltaic) pays for the installation and maintenance of an on-campus system, resulting in zero up-front costs for the College, and sells the power generated back to the College.
- >> **Debt** The College can issue tax-exempt bonds to finance large-scale projects, such a large renewable energy installation.
- >> **Investments** The College can view sustainability projects as opportunities to invest the endowment directly and collect earnings from the resulting savings.
- >> **One-time allocations** The College may continue to allocate funds on a case-by-case basis for major projects, preferably with guidelines for when allocations are made (for instance, when a project has a certain payback period or internal rate of return).

Institutions all over the world, including businesses, non-profits, and educational institutions, are constantly developing new financial mechanisms for funding sustainability efforts. As this plan is implemented, the College will inevitably determine new means of funding projects and programs.

Priority Recommendations

This Plan explores a large variety of actions the College could take to reduce emissions in order to meet reduction goals, whether they are in line with the State of California's goals or some other set of standards. While the list above is not prioritized, the following actions are recommended as the most important and potentially effective:

- >> Adopt the State of California's first emissions reduction target of a 20% reduction of current emissions by 2020 (then explore potential for meeting the State's second target)
- >> Implement HVAC setpoints/scheduling to reduce unnecessary heating and cooling
- >> Perform energy audits on targeted buildings
- >> Implement all energy efficiency projects with payback periods of equal to or less than two years (considering larger projects based on internal rate of return and as an investment of College funds)
- >> Update Green Building Standards for all new construction and renovation, mandating at least LEED Gold if a LEED-based standard is chosen and incorporating the standards of the Labs21 Program
- >> Move forward with identified renewables projects
- >> Continue to develop and offer an annual faculty development workshop on sustainability in the curriculum
- >> Develop specific funding mechanisms for sustainability programs and projects

Implementing the above projects and programs would provide information and resources necessary to significantly reduce College emissions and provide more educational and awareness-building opportunities for the campus community.

Appendix A - Environmental Policy

Pomona College Statement of Environmental Policy (Approved by the Board of Trustees - May 16, 2009)

Pomona College recognizes that the local and global environment in which it operates must be protected for future generations. It is therefore committed to the further development of an ethos of resource sustainability among faculty, staff, and students and to the incorporation of environmentally sound practices in its operations. Such commitments are essential if future generations are to have a healthy and productive environment.

Sustainability Values

The following are recognized as central values of the College that pertain to sustainability and environmental impacts:

- Leadership – Leading the way with teaching sustainability and practicing sustainable lifestyles
- Education – Providing both a thorough classroom education on sustainability and environmental issues and spreading information and best practices related to sustainability technologies, ideas, and behavior
- Conservation – Protecting quality of life and environment for current and future generations through reduction in resource use and impacts
- Solutions-based progress – Utilizing simple, straight-forward solutions where possible, while also exploring new technologies and advanced techniques
- Long-term perspective – Taking a long-term perspective in analyzing opportunities, making decisions, and prioritizing resources
- Stewardship – Preserving and restoring the Southern California climate and ecosystem, including biodiversity, through campus development, academic research, and service
- Community – Generating an intentional community that emphasizes sustainability
- Participation – Providing a participatory process of learning sustainability so that all members of the community are highly aware of the issues and their possible solutions
- Integration – Ensuring every member of the campus community comes into contact with sustainability efforts and considers sustainability while making decisions
- Economic responsibility – Making sound financial investments in sustainability-related projects and programs in order to maximize financial savings and environmental benefits
- Social justice – Recognizing that environmental impacts are disproportionately experienced by underrepresented populations and emphasizing environmental justice issues when discussing sustainability efforts

Appendix A - Environmental Policy

Policy Implementation

The Pomona College community affirms its commitment to the environment by incorporating the above values and implementing this policy in the following ways:

- **Campus Planning, Maintenance, and Construction**

The College's capital planning and approvals process for new construction and major renovation of existing facilities will incorporate the Sustainability Values in its review. Each department and program proposing a capital project will be required to establish specific objectives consistent with this policy's Sustainability Values as part of the formal approval process, and all projects and project decisions will be assessed using life cycle cost-benefit analysis. Campus-wide building standards for new construction and major renovation projects will be mandated in the College's Green Building Standards. Departmentally-funded infrastructure projects will need to comply with similar project review, establishing sustainability-related objectives with the assistance of Campus Planning and Maintenance and the Sustainability Integration Office.

- **Financial and Budgetary Planning**

The College budget planning process will include explicit recognition of the Sustainability Values in the commitment of operating funds. This commitment includes: funding the administrative and program needs of the Sustainability Integration Office and providing separate funding within Campus Planning and Maintenance for sustainability projects and programs. Cost-saving sustainability measures will be considered appropriate investments of College funds, subject to financial analysis.

- **Educational and Research Support**

Recognizing that education is the cornerstone to achieving sustainability goals, the College will continuously develop and recognize efforts to expand curricular, research, and extra-curricular opportunities for sustainability-related education. This includes recognition of the College's sustainability efforts in major communications outlets and the use of sustainability programs and projects in Admissions materials.

- **Ongoing Assessment and Review**

Concepts of sustainability continuously evolve over time with added experience, research, and technological advances. The College will appoint a standing Sustainability Committee charged with working with the Sustainability Integration Office to generate, administer, and monitor an implementation framework for this policy. This Committee will also be responsible for annual reporting on progress toward sustainability goals and for providing recommendations for revising the implementation framework.

Appendix B - Participants

The following individuals participated in the data gathering, analysis, and discussions that contributed to this report:

President's Advisory Committee on Sustainability (PACS)

Prof. Charles Taylor, chair

Prof. Ann Davis, Philosophy

Prof. Dwight Whitaker, Physics

Bowen Patterson, Sustainability Coordinator

Kris Fossum, Assistant Dean

Neil Gerard, Associate Dean and Director of the Smith Campus Center

David Janosky, Dining Services General Manager

Margie McKenna, Assistant Director of Campus Planning and Maintenance Operations

Kevin Quanstrom, Grounds Supervisor

Sandra Seisedos, Housekeeping Supervisor

Samantha Kanofsky '09, Environmental Affairs Commissioner

Student members included: Chelsea Hodge '09, Elise Novak '09, Jamie Hall '12, Daniel Zucker '10, Adam Kotin '09

Sustainability Action Fellowship

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Katie Hall '09

David Kotevski '10

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Chelsea Hodge '09

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Ariel Gondolfo '11

Mackenzie Grieman '09

Zack Mattler '11

Waste

Elaine Choi '11

David DiTullo '11

Pauline Wang '12

Nate Wilairat '11

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Isabelle Ballard '11

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Eleanor Hughes '10

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Appendix B - Participants

Campus Sustainability Audit

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Lucila Arango, trustee

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Marylyn Pauley, trustee

Jason Rosenthal, trustee

Eileen Wilson-Oyelaran, trustee

Prof. Charles Taylor, Chemistry

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