

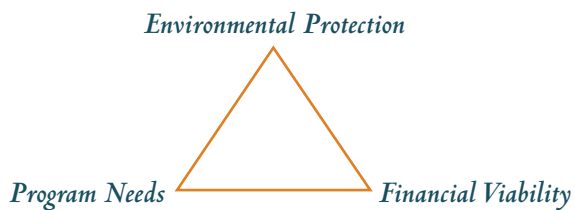


CAL POLY

## A CONCEPT OF SUSTAINABILITY

Sustainability refers to ways that we as individuals and as a community can use natural resources to meet current needs without jeopardizing the needs of future generations. At Cal Poly, we strive to be responsible stewards of our lands, water, energy and other natural resources. This stewardship occurs in the context of furthering our principal academic mission and must reflect financial reality. Thus, sustainable operations and development can be viewed as a triad of interrelated forces that must become mutually supportive.

*The goal of a sustainable campus involves balancing Environmental Protection, Academic Program Needs and Financial Viability.*



*As a polytechnic university, it is at the core of our mission to examine the ways in which knowledge may be applied to improve society, manage scarce resources and protect and preserve our environment.*

*Sustainability is a high priority for the University and a key issue that should cut across all we do, including teaching, research and the practices we engage in on the campus.*

— President Warren Baker

# SUSTAINability

FOR CAL POLY FACILITIES & OPERATIONS



*The Bonderson Engineering Projects Building was awarded "Best Overall Sustainable Design in New Construction" by the UC / CSU / CCC Energy Efficiency Partnership Program in 2008.*

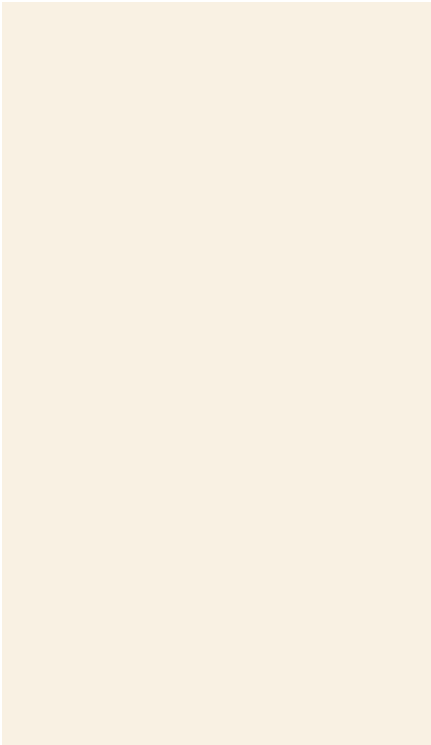
The image shows the exterior of the Bonderson Projects Center, a modern building with a large glass facade and a yellow-tinted wall. A person with a green backpack is walking on a paved path in the foreground, and several bicycles are parked nearby. The building's name and the year '197' are visible on the wall.

BONDERSON  
PROJECTS  
CENTER  
197

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# university presidents for a sustainable future



## **1. INCREASE AWARENESS OF ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT**

Use every opportunity to raise public, government, industry, foundation and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.

## **2. CREATE AN INSTITUTIONAL CULTURE OF SUSTAINABILITY**

Encourage all universities to engage in education, research, policy formation and information exchange on population, environment and development to move toward global sustainability.

## **3. EDUCATE FOR ENVIRONMENTALLY RESPONSIBLE CITIZENSHIP**

Establish programs to produce expertise in environmental management, sustainable economic development, population and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.

## **4. FOSTER ENVIRONMENTAL LITERACY FOR ALL**

Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate and professional students.

## **5. PRACTICE INSTITUTIONAL ECOLOGY**

Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction and environmentally sound operations.



**6. INVOLVE ALL STAKEHOLDERS**

Encourage involvement of government, foundations and industry in supporting interdisciplinary research, education, policy formation and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems.

**7. COLLABORATE FOR INTERDISCIPLINARY APPROACHES**

Convene university faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations and outreach activities that support an environmentally sustainable future.

**8. ENHANCE CAPACITY OF  
PRIMARY AND SECONDARY SCHOOLS**

Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment and sustainable development.

**9. BROADEN SERVICE AND OUTREACH  
NATIONALLY AND INTERNATIONALLY**

Work with national and international organizations to promote a worldwide university effort toward a sustainable future.

**10. MAINTAIN THE MOVEMENT**

Establish a secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.



# SUSTAINABILITY in facilities & operations



Photo provided by Cal Poly

In 2004, President Warren Baker signed the international Talloires Declaration (see pages 4 and 5) which provides the framework and direction for sustainability at Cal Poly in regard to academic programs, teaching and research, as well as campus planning, development and operations, and land and resource stewardship.

## WHAT'S NEW IN THIS REPORT

The Sustainability Advisory Committee recommended a few additions to the “suite” of indicators in the 2006 report. Most notably, the importance of greenhouse gas (GHG) emissions warrants its inclusion among the indicators. This report starts our tracking of overall emissions as well as the percentage of electricity provided through non-GHG emitting sources.

Also, wherever applicable, targets for the various parameters have been incorporated explicitly into the trend charts.

This report focuses on sustainability in the University’s facilities and operations. Starting in 2006, Cal Poly established a number of indicators of campus environmental sustainability. This is the second report on those metrics; future updates are planned on a biennial basis.

The Facilities Services Department is responsible for most of the operations and maintenance on the core campus. However, several other departments are also engaged in functions important to the sustainable University:

- **Facilities Planning and Capital Projects** oversees long-range physical planning and new construction.
- **The College of Agriculture, Food and Environmental Science** manages extensive University lands in San Luis Obispo and Santa Cruz counties.
- **Environmental Health and Safety** monitors water quality and air quality, as well as overseeing hazardous materials handling.
- **The University Police Department** runs the parking operations and programs related to alternative transportation modes.
- **Housing and Residential Life** manages the expanding on-campus residential facilities.
- **The Cal Poly Corporation** operates a number of important functions for the University, including campus dining.

Cooperation and coordination among these many functions is critical to a sustainable future, and this work is directed by the Campus Sustainability Manager.





Variables that are linked to sustainable practices and outcomes, and that can be measured by a consistent methodology, are called *indicators* of environmental change. Cal Poly's indicators suggest a comprehensive picture of how the campus as a system is changing. These variables can be measured consistently over time. Wherever possible, they are tied to other existing reporting requirements.



## CAL POLY SUSTAINABILITY INDICATORS

### Energy Use

- BTUs per square foot of buildings
- Percentage of electricity from renewable resources
- Percentage of vehicles in the campus fleet using alternative fuels

### Transportation

- Commuter parking permits sold per student
- Public transit ridership
- Percentage of student population living on campus

### Water Resources

- Total domestic water use
- Total domestic water use per square foot of building
- Indoor water use
- Pollutants in wastewater
- Nitrates in groundwater monitoring wells
- Fecal coliform in Stenner Creek

### Solid Waste and Recycling

- Percentage of solid waste diverted from landfills

### Land Use and Development

- Percentage of campus square footage in LEED or CSUPER certified buildings
- Habitat restoration projects

### Greenhouse Gases

- 2006 baseline for ongoing emissions monitoring
- Percentage of electricity from non-GHG emitting sources

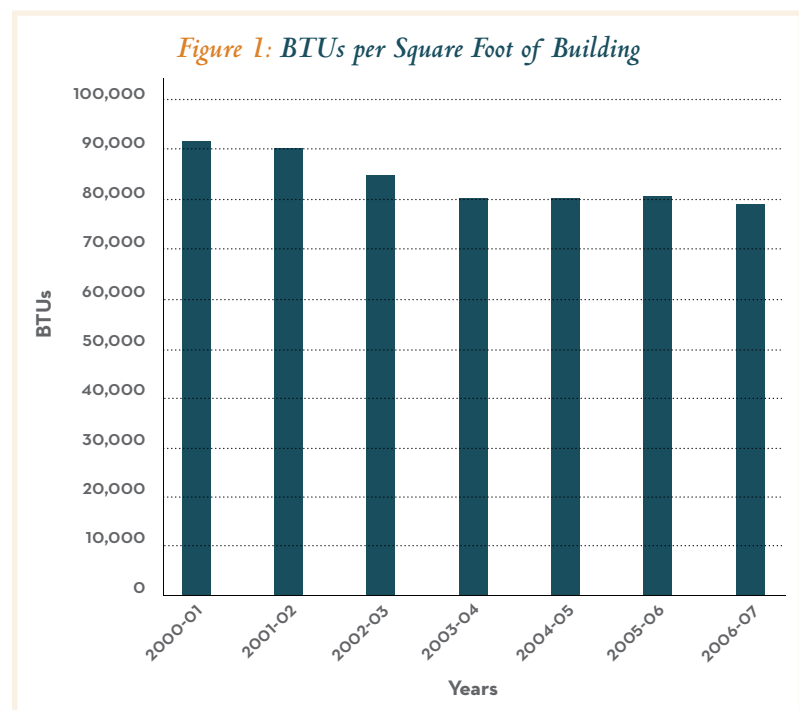
## CALIFORNIA STATE UNIVERSITY (CSU) EXECUTIVE ORDER 987

The CSU Chancellor's Executive Order 987 directly addresses several issues related to sustainability. This Executive Order specifically:

- Sets a goal of reducing total energy usage per square foot of building by 15 percent between 2005 and 2010.
- Requires campuses to achieve U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification or equivalent and to strive for LEED Silver in all new buildings.
- Establishes a purchasing policy with regard to energy-efficient appliances; the CSU has been an Energy Star partner since 1997.
- Requires a minimum of 20 percent of energy purchases be from renewable resources by 2010.
- Sets a target of 50 MW on-campus electricity generation, system-wide, by 2010.

EO 987 also directs the CSU to develop a set of guidelines that will provide a meaningful alternative to LEED that is especially suited to university campuses. Known as the *CSU Program for Environmental Responsibility* (CSU PER), Cal Poly management, faculty and staff have been participating in its development.

Between 1999 and 2003, Cal Poly's total energy use per square foot of building space fell by about 13 percent due to dozens of energy-efficiency measures (see *Figure 1*). In 2003, the Cerro Vista apartments opened and total British Thermal Units (BTUs) per square foot of campus buildings began to rise slightly. Since then, energy efficiency has remained approximately stable: as several new buildings were opened during this decade, and as the campus population has grown, the energy use per square foot has not changed significantly. BTUs include both electricity and natural gas use.



## ENERGY CONSERVATION

In 2007, Cal Poly retained Chevron Energy Services to conduct a campus-wide energy audit, the largest undertaken in the CSU system. The first phase of the audit was recently completed. A variety of energy conservation opportunities have been identified, and approximately \$6 million of projects approved. In many cases, the savings from lowered utility expenditures will recover the upfront capital costs within 15 years or sooner. The campus can expect an estimated 10-12 percent reduction in energy per square foot by the year 2010.

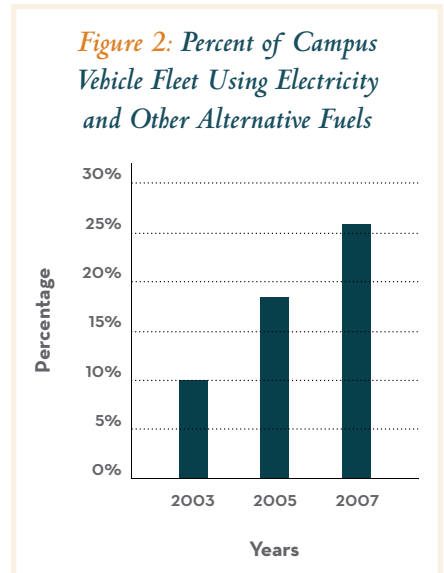


## VEHICLE FLEET

The campus vehicle fleet is quickly converting to electricity and other alternative fuels. In 2007 more than 25 percent of all campus vehicles operated on fuels other than gasoline or diesel, including 87 electric cars and carts (see Figure 2).

## RENEWABLE SOURCES OF ELECTRICITY

The CSU has set a goal that at least 20 percent of its electricity purchases should be from renewable sources by 2010. In 2005, Cal Poly received the bulk of its electricity from Arizona Power Supply. Approximately 17 percent of total electricity was from “eligible renewable sources” at that time, which include biomass, geothermal, small hydroelectric, solar and wind generators. Large hydro and nuclear power plants, although they do not produce greenhouse gases, are not counted among the eligible renewable sources. More recently, Cal Poly has contracted with PG&E and receives about 13 percent of our electricity from eligible renewable sources. PG&E includes significant amounts of large hydropower and nuclear in its portfolio, however, so that almost one half of Cal Poly’s electricity is supplied by technologies that do not emit carbon dioxide (see Figure 3).



**Figure 3: Electric Power Mix 2007**

	Percent	Eligible Renewable	Non-GHG Emitting
Biomass and Waste	4%	Yes	No
Geothermal	3%	Yes	Yes
Small Hydro	3%	Yes	Yes
Solar	1%	Yes	Yes
Wind	2%	Yes	Yes
Large Hydro	12%	No	Yes
Nuclear	24%	No	Yes
Natural Gas	49%	No	No
Coal	2%	No	No
<b>Total</b>	<b>100%</b>	<b>13%</b>	<b>45%</b>



◀ *By 2007, one quarter of Cal Poly’s vehicle fleet was electric powered.*

▼ *As of 2008, Cal Poly’s photovoltaic array on Building 21 is the largest in San Luis Obispo County.*





## THE CHALLENGE OF BOUNDARIES

One challenge with evaluating a campus's efforts at sustainability is that ecological variables do not stop at a university's boundaries. Resources such as air, water and housing-circulation systems all extend into the surrounding region.

The issue of appropriate boundaries is especially relevant at Cal Poly where the Master Plan direction is to increase on-campus housing to reduce automobile commuting because of the attendant benefits to air quality, energy use and congestion reduction (as well as the creation of a stronger residential ambiance). But, when we track a variable such as energy use on the campus, the addition of large-scale campus residential neighborhoods like Poly Canyon Village (PCV) will result in observable increases in natural gas and electricity consumption. At the same time, however, energy use is also reduced as fewer students commute by car to campus. Certain metrics required by the CSU, such as total energy consumption on campus per building area, simply do not account for this more comprehensive view of energy use in the larger, regional energy-flow system.

Consider, too, that new construction such as PCV is certified pursuant to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program and has environmental features such as a co-generation facility. This new on-campus housing is surely more energy efficient than almost all off-campus housing options. Thus, providing housing on campus will certainly result in net energy savings—but those savings might not be captured if the measurement is limited to electricity and natural gas consumed within the campus boundaries.

This problem is even more apparent when one considers GHG emissions. Again, from the perspective of campus emissions alone, on-campus housing makes GHG levels higher for the university. But, those people would live somewhere, and off-campus locations would result in higher GHG production from auto commuting and less energy efficient housing options. A widely recognized mitigation for GHG emissions, in fact, is the development of housing within walking distance of jobs and schools. The challenge is to ascertain and maintain the proper perspective: viewing environmental impacts in the context of human ecological systems and at an appropriate scale.

The University's Master Plan sets a goal of reducing automobile commuting by 25 percent between 2002 and 2020. The number of *commuter* parking permits (that is, general and staff annual and quarterly permits) dropped from 7,774 permits sold in 2002, to only 5,998 in 2007. This decline occurred despite increases in student enrollment and faculty/staff positions. Based on the number of permits sold per student, the decline over the past five years has already exceeded the 25 percent target (see *Figure 4*).

The reduction in commuting since 2002 can be attributed to several interrelated factors including more on-campus housing, higher costs for parking permits, fewer parking spaces for commuters, improved transit routes and other programs to encourage alternative modes, as well as rising gasoline and insurance costs.

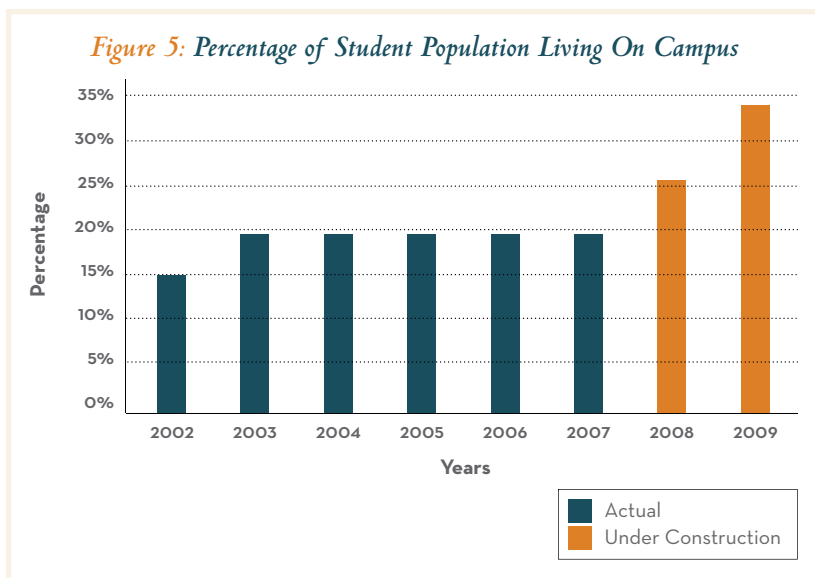
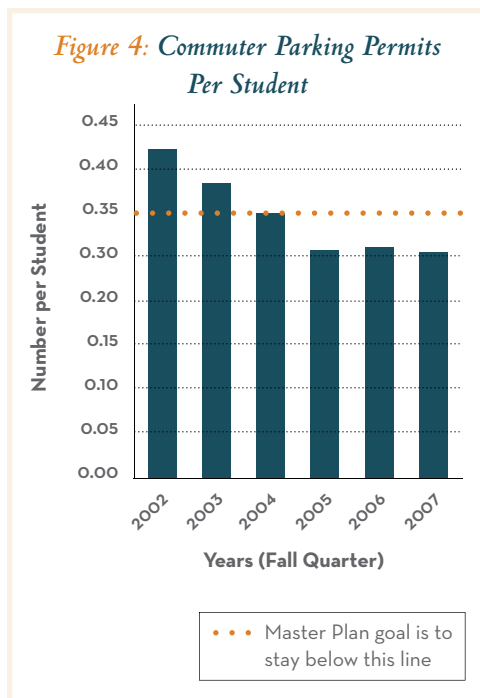
## ON-CAMPUS HOUSING

The Master Plan envisions Cal Poly becoming more of a residential campus, creating a stronger live-learn environment that accords with *smart growth* principles. Mixing housing with support services and the learning facilities on the campus reduces commuting – and attendant air pollution, noise and congestion. Since adoption of the Master Plan in 2001, the Cerro Vista student apartment project has been built and opened, providing accommodations to 800 students.

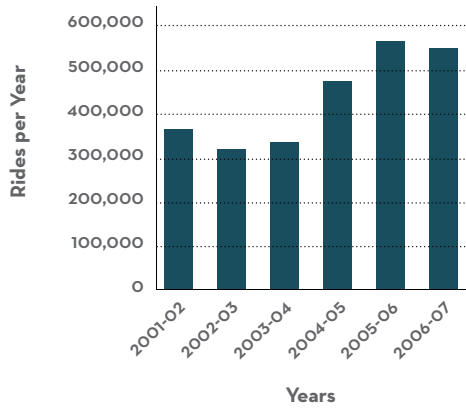
The much larger Poly Canyon Village project will house 1,539 students starting in Fall 2008, and another 1,125 in Fall 2009. The Poly Canyon Village not only includes apartments, but also a coffee house, other food services, a small retail market, exercise facilities and meeting rooms.

By 2009, with these new housing complexes, along with the older dorm-style facilities, approximately one-third of the University's students will be living on campus (see *Figure 5*).

In addition to student housing, the Cal Poly Housing Corporation completed 69 units for faculty/staff in 2007. These townhomes are located at the northwest corner of Highland Drive and Santa Rosa Street, adjacent to the campus.



**Figure 6: Cal Poly SLO  
Transit Ridership**



## TRANSIT RIDERSHIP

All Cal Poly students, faculty and staff can use the local transit system for free thanks to a cooperative agreement between the University and the City of San Luis Obispo. Cal Poly contributes approximately \$330,000 each year to the City to assist with transit costs; the sources of that contribution are parking permits and parking fine revenues. Thus, automobile users are, in effect, subsidizing bus use. Bus ridership has shown a remarkable increase over the last few years (see *Figure 6*).

## TDM EFFORTS

Traffic Demand Management (TDM) encompasses a variety of strategies to reduce automobile use, especially during peak commuting times. Cal Poly has instituted the OPTIONS program that provides information and incentives for members of the University community to use carpools, vanpools and other alternatives to single-occupancy automobiles. Many staff departments accommodate flexible work hours to allow employees to avoid peak commuting times. The U.S. EPA has recognized Cal Poly as one of the best commuter programs in the country.



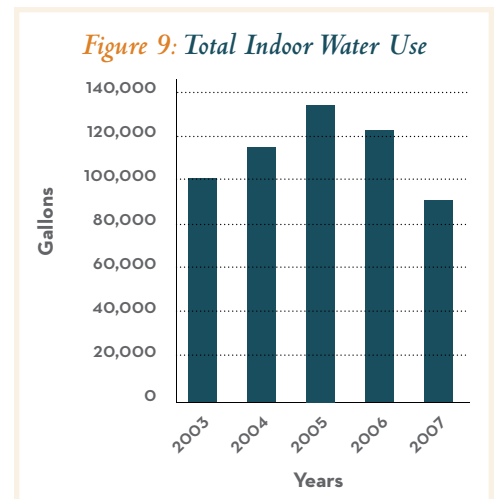
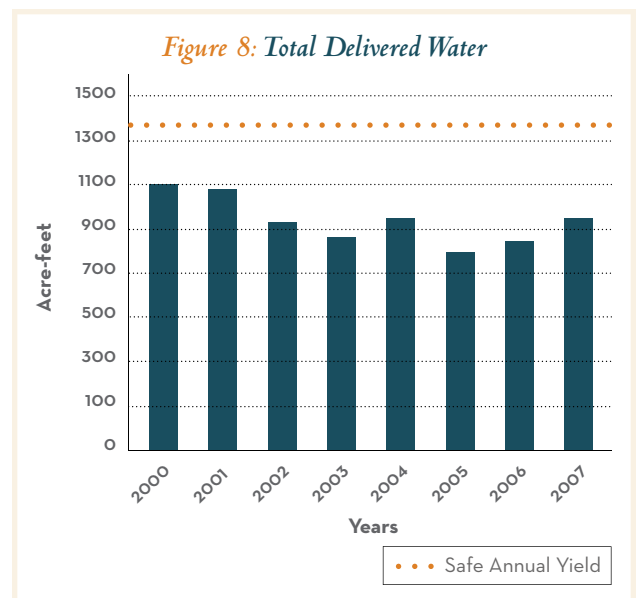
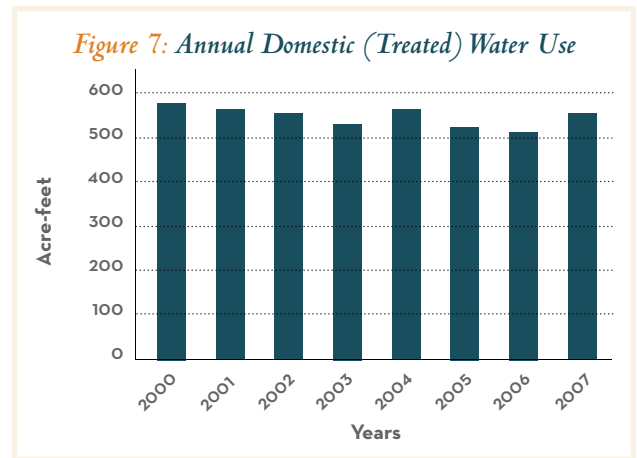
Cal Poly's source for domestic (treated) water is Whale Rock Reservoir, located near Cayucos. Cal Poly shares that water with the California Men's Colony and the City of San Luis Obispo (see Figure 7).

Cal Poly also uses untreated water delivered from the Salinas Reservoir, located upstream from Santa Margarita, for various agricultural purposes. This water is less expensive than the treated water. The amounts delivered from the Salinas Reservoir are deducted from Cal Poly's Whale Rock allocation. Figure 8 shows Cal Poly's total water use (excluding on-campus wells and small ag-related reservoirs). The *safe annual yield* is the amount of water that can be delivered to Cal Poly each year without jeopardizing future water availability, even during drought conditions. Cal Poly's demand remains substantially below its supply capacity.

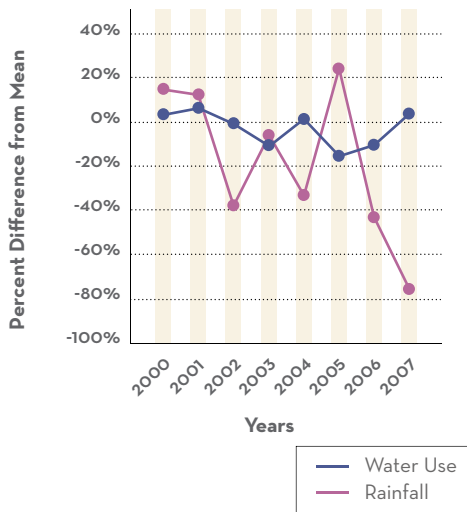
## WATER CONSERVATION

Water demand is closely linked to weather. During wet years, irrigation use declines; in dry years, the need for stored water increases. Rainfall during 2006 and 2007 was considerably below long-term averages (see Figure 10). Thus, although the trend among the previous years showed a general decline in water use, this was reversed during those two years. Looking at indoor water use gives a picture of how water conservation measures, apart from landscaping and agricultural use, are performing (see Figure 9).

Despite new campus buildings and a growing campus population, as well as a dry winter, indoor water use declined to its lowest level in five years during 2007.



**Figure 10: Water Use versus Rainfall**

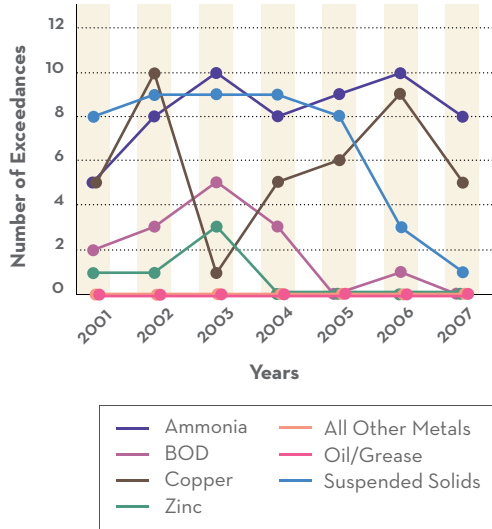


## WATER QUALITY

Cal Poly monitors water quality in its creeks, in groundwater and in wastewater entering the sanitary sewer system. Water quality monitoring is conducted by the University's Department of Environmental Health and Safety, which submits regular reports to the Central Coast Regional Water Quality Control Board.

In cooperation with the City of San Luis Obispo, the University checks the water quality of its sewage effluent as it leaves the campus and enters the city-wide collection and treatment system. Of particular concern are pollutants that may adversely affect treatment. *Figure 11* shows the number of times Cal Poly has exceeded usual water quality standards each year for a variety of constituents; tests are conducted monthly.

**Figure 11: Wastewater Pollutants**



### THE CHALLENGE OF WEATHER

Short-term changes in many sustainability indicators can be significantly influenced by weather. Consider that in unusually warm years, air conditioning demand rises above long-term averages, while in unusually cool years, heat demand increases. These fluctuations obviously affect energy use. Another important weather variable, especially here at Cal Poly which has such a large agricultural and grazing component, is rainfall. Wet years reduce the need for water for crop production, livestock and landscaping. Dry years, of course, result in increased use of water from reservoirs. *Figure 10* shows the percentage difference from long-term averages both in rainfall levels and water use over the last few years. In general, there is a strong negative correlation: when rainfall is below average, demand increases; and demand dips when rainfall levels rise. Notice that 2007 was an unusually dry year, and that water demand increased after a longer term downward trend. For variables such as water, it is the longer-term trend that is more illustrative than annual spikes and valleys.

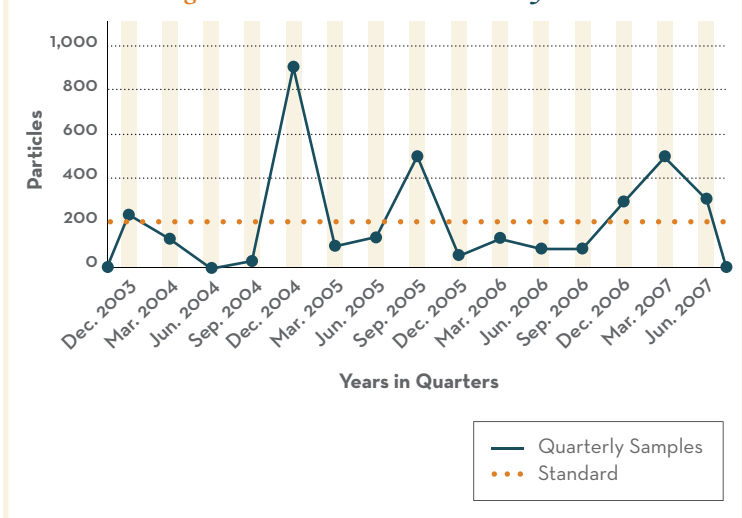




In 2007, most of the pollutants did not exceed standards. Suspended solids exceeded the limits only once, a significant decline from earlier in the decade. High zinc levels discovered a few years ago were traced to certain cleaning products, and subsequent changes in maintenance protocols reduced this pollutant in the waste stream. Two parameters, ammonia and copper, continue to show relatively high concentrations. This persistence is thought to be linked, in these cases, not to especially high levels of the materials, but to lower volumes of effluent due to water conservation measures. Environmental Health and Safety is working with the Regional Water Quality Control Board to revise the monitoring methodology to measure mass levels of these potential pollutants rather than simply their concentrations. This may give a more meaningful picture of changes in the amounts of these materials entering the waste stream over time.

Cal Poly regularly monitors the water quality in Stenner Creek, focusing on fecal coliform, a measure of bacterial contamination. That pollutant can enter the stream from water draining from streets and parking lots, farm and livestock operations, sewer or septic system leaks and other sources. Quarterly sampling over the last four years does not indicate any regular trend or seasonal pattern (see Figure 12). For over a year in 2005-06, fecal coliform levels did not exceed acceptable standards, only to spike again in late 2006 to early 2007. One possible explanation may be low rainfall levels during the 2006-07 winter, lowering stream flow volumes, thereby increasing concentrations of this pollutant in the water that did remain in the creek.

Figure 12: Stenner Creek Fecal Coliform



### WATER QUALITY MANAGEMENT PLAN AND STORM WATER POLLUTION PREVENTION PLAN

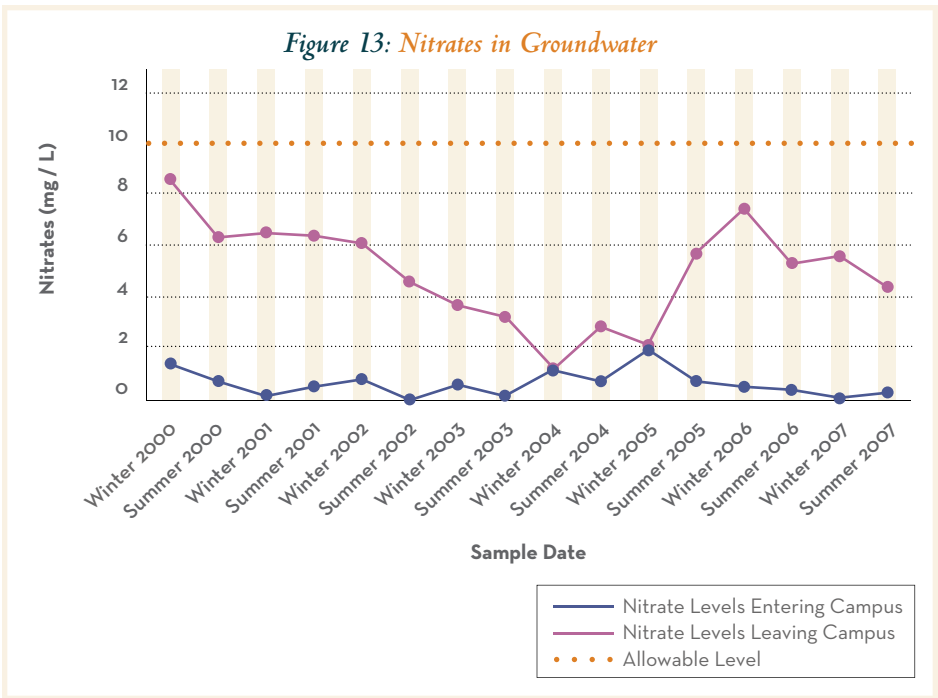
Perhaps the most important policies for water quality protection are contained in the Cal Poly Water Quality Management Plan. This document lists numerous Best Management Practices, or BMPs, that prescribe how water resources will be protected. The Water Quality Management Plan includes measures related to grazing, farm operations, construction, erosion control and storm water drainage. For example, all new construction projects must utilize water pollution prevention measures such as barriers to capture sediment laden runoff. These are now standard, mandatory practices on all projects.

The principal goal of the Water Quality Management Plan is to “preserve, protect and enhance the quality of water of the Cal Poly Campus and surrounding areas.” The plan covers both *point* sources of pollution (specific locations that may generate polluted effluent) and *non-point* source pollution which is generally associated with runoff into streams. The University also operates under a Storm Water Pollution Prevention Plan (SWPPP) approved by the Regional Water Quality Control Board. The SWPPP specifically covers measures to reduce or prevent pollution carried by rainfall.



Photo: Kate Koyan

▲ Chumash Creek, once denuded of vegetation, is the site where grazing BMPs were developed and tested under a 10-year program. Successful practices are now being applied on other campus creeks as well as elsewhere in the Morro Bay Estuary watershed.



Cal Poly also monitors its groundwater, tracking especially nitrate, a pollutant that can come from sources like animal manure, certain fertilizers and leaking sewage or septic systems. *Figure 13* shows nitrate levels as groundwater enters the campus and then as it moves off campus. Nitrate levels generally rise as water flows under the campus, but have not exceeded standards at the downstream campus edge.



The majority of Cal Poly's solid waste is currently recycled or otherwise re-used. Cal Poly has a staff position devoted specifically to recycling operations.

Almost all landscape *green waste* is either used on campus or is sent to off-campus composting facilities. Paper, aluminum, glass and plastics are taken to recycling facilities. Building contracts require that a significant portion of materials left over from demolition and waste from construction be recycled or re-used, rather than simply dumped in a landfill. Cal Poly's state-mandated target is to divert at least 50 percent of its solid waste from landfill disposal. For the last several years, Cal Poly has exceeded this goal (see *Figure 14*).

At Cal Poly, one of the largest sources of solid waste is manure from the various agricultural facilities. Most of that yard waste is composted and sold as fertilizer as a Cal Poly Corporation enterprise operation in cooperation with the College of Agriculture, Food and Environmental Science (CAFES).

More recently, Campus Dining in cooperation with the CAFES has been composting most food waste. Almost one ton of such waste is being diverted from the landfill to on-campus composting sites each day, including a significant amount of post-consumer waste.

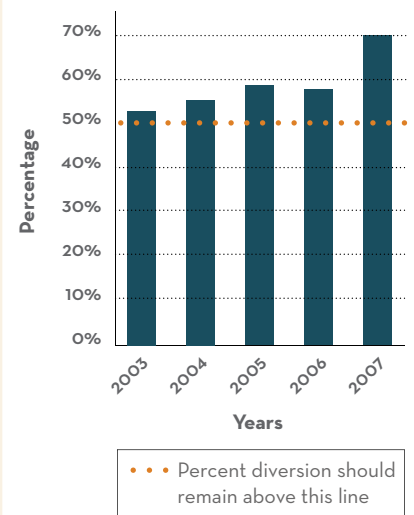
Campus Dining also recycles its waste cooking oil into bio-diesel fuel and uses bio-diesel in its vehicles, saving about 260 gallons of conventional fuel each year. Campus Dining has converted from polystyrene packaging to recyclable or compostable products; this adds up to over 800,000 cups, boxes, bowls and plates in a typical year.

- ▼ *Campus Dining delivers hundreds of pounds of post-consumer food waste and compostable food containers to on-campus composting facilities on a daily basis.*



Photo provided by Cal Poly

*Figure 14: Percent of Solid Waste Diverted From Landfill*



The consequences of climate change – as projected by many scientists, including those involved in the United Nations Intergovernmental Panel on Climate Change – will be significant and unprecedented in history. Human contributions to global warming are associated with the emissions of Greenhouse Gases (GHG), primarily carbon dioxide, but also other substances such as methane.

Cal Poly’s primary mission in meeting this challenge – which is truly global in scope – is to provide the best, appropriate education we can to our students, and to support faculty and student research into the causes of, and solutions to, global warming. As a polytechnic university, we are especially well situated for this role and we have had notable progress in this regard. The Academic Senate and its Sustainability Committee, for example, have been working on approaches to increasing the emphasis of sustainability in the curriculum.

In addition, Cal Poly is working on measuring and reducing its own GHG emissions (see *Figure 15*). In 2006, California enacted AB 32, the Global Warming Solutions Act. This law sets a statewide target of reducing GHG emissions to 1990 levels not later than 2020. The previous year, Governor

Schwarzenegger issued Executive Order S-3-05 which sets a target of reducing emissions to 80 percent below 1990 levels by mid-century. These are among the most ambitious standards in the world.

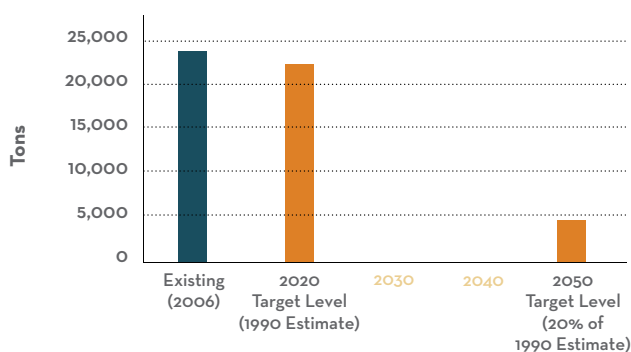
The CSU has been charged with meeting these targets as a system; progress is being tracked cumulatively across the 23 campuses through monthly reports to the Chancellor’s Office. As part of the CSU system, Cal Poly has joined the California Climate Action Registry (CCAR) and is using the CCAR protocols for measuring GHG emissions.

The Chancellor’s Office is computing baselines for each campus. Because this is a new program, the data needs and uniform methodologies are still being worked on as of this writing (spring 2008). However, based on a preliminary analysis, Cal Poly’s “baseline” GHG emissions for 2006 were estimated as the equivalent of about 24,000 tons of carbon dioxide.

The CSU does not require campuses to take into account emissions associated with the transportation sector. Cal Poly, however, has voluntarily agreed to monitor this important source of GHG emissions, particularly as they relate to automobile commuting and business-related air travel by faculty and staff. Based on a preliminary analysis only, these transportation-related sectors contribute approximately another 16,000 tons per year, about 40 percent of Cal Poly’s total.

Including this sector, Cal Poly’s baseline total for 2006 is about 40,000 tons of carbon dioxide equivalent. As data become more available, and as measuring protocols become more consistent, these preliminary estimates will be refined in future reports. Cal Poly will continue to monitor GHG emissions variables to track trends toward achieving AB 32 goals.

**Figure 15: Estimated GHG Emissions Targets (Natural Gas and Purchased Power)**





Cal Poly's Master Plan was adopted by the CSU Board of Trustees in 2001. It calls for an environmentally responsible campus with a high regard for land stewardship, resource efficiency, energy conservation and bio-diversity. Cal Poly's Master Plan is much more than a map showing where buildings go. It incorporates a thorough environmental review and includes several principles for guiding the future campus. Many of these principles directly address sustainability and provide a system-level ecological framework for the University's development and operations. Examples of principles in the Master Plan include:

- Protect environmentally sensitive areas, including prime farm land.
- Enhance environmental resources.
- Maintain habitats of sufficient size to support diverse species.
- Promote sustainability in design, including energy and water conservation.
- Reduce vehicle trips and promote alternative transportation.
- Develop more on-campus housing and related services to reduce automobile commuting.

Over the last few years, the University has been implementing the plan employing the principles listed above.

## LAND PRESERVATION AND ENHANCEMENTS

The Master Plan designates several areas as natural preserves; in addition, buffers have been designated along its major creeks. These areas must be kept open and, where needed, habitat restoration should take place.

Since the last biennial report, several habitat enhancement projects have been undertaken on campus. In 2007, the College of Agriculture, Food and Environmental Sciences (CAFES) was involved with a Stenner Creek riparian habitat enhancement project. The project, which was mitigation for a since-corrected problem at the Cal Poly dairy, included restoring native plants on the creek floodplain. At the same time, under the direction of Dr. James Vilkitis, the floodplain of Brizzolara Creek across from Poly Canyon Village was enhanced through the planting of native vegetation.

CAFES also continued implementation of the Water Quality Management Plan's Best Management Practices (BMPs) including fencing areas within the Chorro, Stenner and Brizzolara Creek watersheds that are sensitive to erosion caused by over grazing, installing erosion control improvements along Poly Canyon Road, stabilizing and providing drainage for Gravel Mine Road, constructing a detention basin at the base of the gravel mine pit, stabilizing slopes along Gravel Mine Road and the old campus landfill and conducting photographic monitoring of these improvements.

The Master Plan also calls for the protection of prime agricultural lands, those considered the most important for crop production. Since adoption of the plan, no prime farm land has been converted to development.





### **CAL POLY ORGANIC FARM**

Cal Poly operates an organic farm on its main campus. About 11 acres produce California Certified Organic crops which are sold locally through a Community Supported Agriculture program. In 2007, over 300 customers subscribed to purchase produce from the farm.



## SUSTAINABLE DESIGN IN BUILDINGS

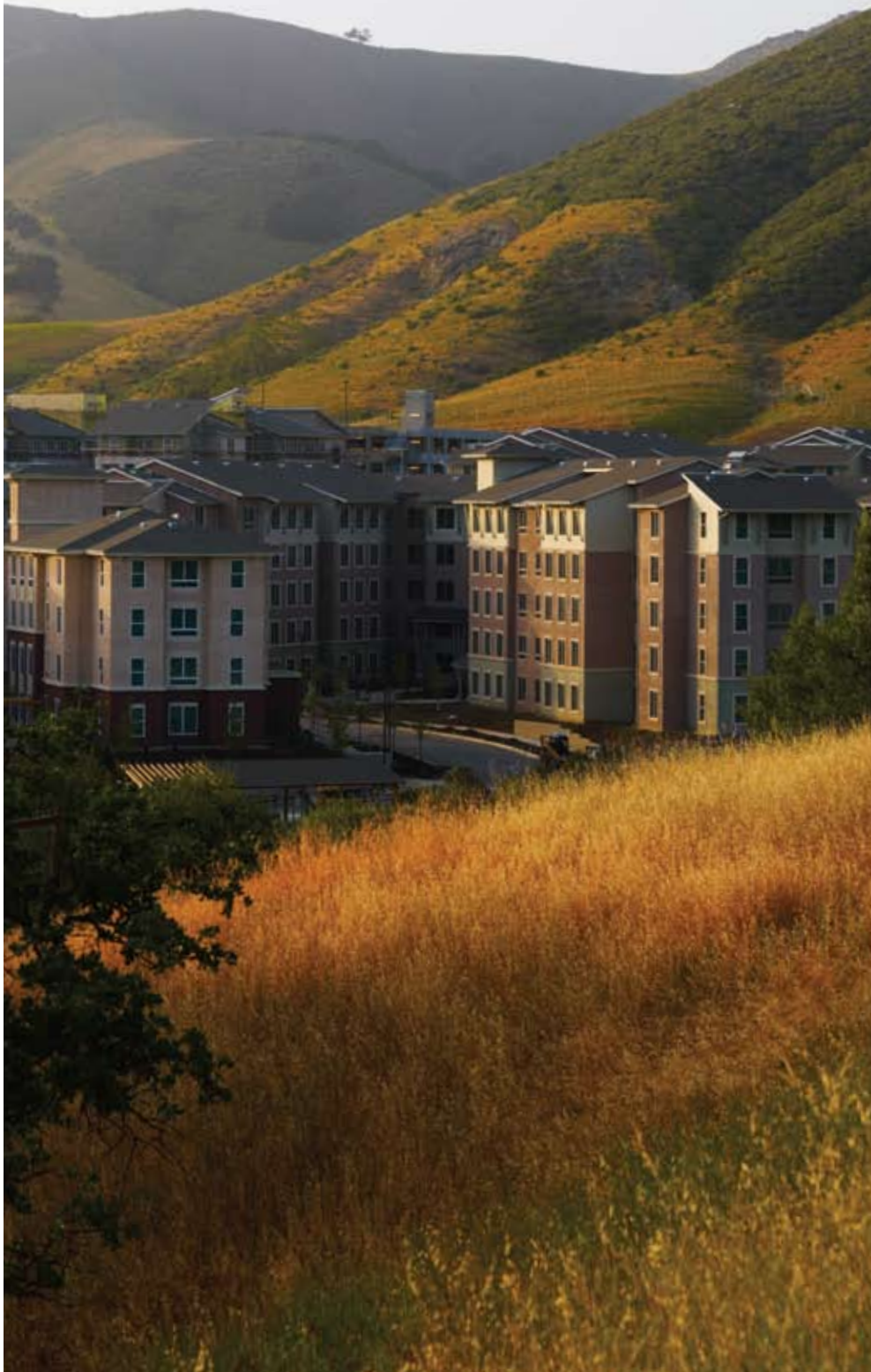
One measure of sustainability is the percentage of campus space that is LEED certified. The CSU has been working on its own Program for Environmental Responsibility applicable to new construction that is expected to also have a certification process.

Prior to 2008, no building at Cal Poly was certified under either program. However, the new Poly Canyon Village, which will open in two phases starting in 2008, is contracted to be LEED certified. This is the largest single development project undertaken at Cal Poly and will account for approximately 20 percent of all the non-farm building space on campus.

Facilities Services has also been working on implementation of the first LEED EB (Existing Building) program. Faculty Offices East has been chosen as the first demonstration building, and has been submitted for LEED certification (spring 2008). Certification will demonstrate that many campus-wide programs, including custodial service, landscape management, recycling, commuter support and building operations, are managed in a manner consistent with LEED principles. Facility Services targets include adding another LEED EB building every three years.

Furthermore, Cal Poly students voted in 2008 to expand and upgrade the Recreation Center. Among the improvements will be sustainability features to meet LEED certification, and that will be a requirement of the construction contract.

*Poly Canyon Village will provide on-campus housing for 2,664 students. The mixed-use project is contracted to be LEED certified.*



# OPERATIONS sustainability plan

Cal Poly endorses the World Commission on Environment and Development definition of sustainability as: *“The concept of meeting the needs of the present without compromising the ability of future generations to meet their needs.”*

## GUIDING PRINCIPLES

Cal Poly operations are committed to the continued improvement in the sustainability of the physical campus. Our guiding principles include the following:

- To be careful stewards of the campus resources.
- To be leaders in sustainable practices.
- To contribute to sustainability as an integral aspect of the Cal Poly learning environment by making such practices visible and accessible.

## TARGETS

In addition to the principles, operations have established the following more specific targets:

- Reduce campus GHG emissions annually between 2008 and 2020 by the amount necessary to achieve 1990 levels by 2020.
- Reduce energy use by an average of 15 percent per square foot of campus space by 2010 (relative to 2005 levels).
- Increase purchase (or production) of electricity from renewable sources by 3 percent per year with a goal of purchasing (or generating) 20 percent from renewable sources by 2010.
- Construct all major capital building renovation projects to LEED certification or equivalent.
- Convert one existing building on campus to achieve LEED EB status or equivalent every three years.
- Have at least 25 percent of the square feet of the conditioned space on campus LEED certified or equivalent by 2010.
- Continue to keep annual commuter parking permits to levels at least 25 percent below that of 2001.

- Divert at least 50 percent of the solid waste stream from landfills through recycling or re-use each year.
- Meet all adopted water quality standards for wastewater effluent, creeks and groundwater.

## ACTIONS

In order to meet those specific targets, operations are undertaking the following actions:

### Leadership

- Created a new position of *Sustainability Manager* and provide additional staff support (2008).

### Energy

- Complete the campus-wide audit of energy savings opportunities, including on-campus generation through renewable sources (2008) and contract to perform projects annually, as necessary to meet and exceed the guiding targets (*starting in 2009*).

### Greenhouse Gas Emissions

- Establish GHG emissions baseline and monitor GHG emissions using CSU and California Climate Action Registry protocols (2008 and *ongoing*).

### New Construction and Major Capital Renovations

- Require energy efficiency and sustainability to be set goals at beginning of schematic design for each new project (*ongoing*).

### Building Operations

- Complete the LEED EB certification for Building 25 (2008).

### Landscape Environments

- Reduce irrigation by installing centralized software-based control in conjunction with a weather station (2008).
- Create a Landscape Management Plan for undeveloped, non-agricultural campus lands (2009).

### Water Conservation and Quality

- Continue the incremental installation of water conserving plumbing fixtures (*ongoing*).



- Meet with City utilities about the possibility of using recycled wastewater for campus purposes (2008).
- Continue to monitor wastewater, surface water and groundwater quality (*ongoing*).
- Investigate and, where feasible, ameliorate sources of potential pollutants if standards are exceeded (*ongoing*).

#### Student / Community Outreach

- Support, house, mentor and oversee the Student *Green Campus Intern* program (*ongoing*).
- Continue to provide employment for student assistants in the trade shops and administrative areas to provide hands-on work experience in sustainability fields (*ongoing*).
- Continue to partner with academic departments where feasible to use campus as a *living laboratory*. Provide open access to plans, records and practices; provide presentations and tours of sustainability operations to students and faculty (*ongoing*).
- Continue to support, mentor and facilitate student senior projects related to sustainable design, construction, operations and maintenance (*ongoing*).
- Support Cal Poly's hosting of the statewide UC/CSU/CCC Sustainability Conference (2008).

#### Fleet

- Continue to transition the general-purpose fleet to alternative-fueled vehicles as existing vehicles are replaced (*ongoing*).
- "Right-size" the fleet by analysis of technologies and vehicle sharing options (2009).

#### Corporation Operations

- Continue to convert waste vegetable oil into bio-diesel fuel to operate campus vehicles (*ongoing*).
- Compost on campus a daily average of 1,500 pounds of food waste including 300 pounds of post-consumer waste (2010).
- Eliminate polystyrene and other non-recyclable food and drink containers from campus dining facilities (2008).

#### Purchasing Practices

- Require all purchases of electrical appliances, computers and equipment to specify Energy Star ratings when available (*ongoing*).

#### University Housing Practices

- Continue to provide housing for undergraduate enrollment increases (*ongoing*).
- Design all future housing to include adequate support facilities to create stronger on-campus neighborhoods (*ongoing*).
- Provide information to all residents regarding energy and water conservation techniques (2008 and *ongoing*).

#### Parking and Commuter Access

- Continue to subsidize local public transit so that the Cal Poly community can ride buses free or at reduced prices (*ongoing*).
- Continue to operate the OPTIONS program encouraging alternative transportation modes (*ongoing*).
- Install a "Class One" bike path and sidewalk along California Boulevard (2008-09).
- Develop a new pedestrian path from Poly Canyon Village to the campus core along Farm Shop Road and Via Carta (2008).
- Incrementally implement improvements to the campus pedestrian system including improved wayfinding, a coordinated system of open spaces and plazas with attendant pedestrian facilities such as benches (*starting 2008 and ongoing*).
- Add at least 60 bicycle racks and 35 lockers to support and promote bicycle commuting (2010).
- Continue the campus vanpool program and add at least one additional van (2010).
- Continue partnership with Amtrak to provide discount fares for students (*ongoing*).
- Research the feasibility of providing charging stations for electric vehicles (2009).





### ◀ GREEN CAMPUS PROGRAM

Facility Services, along with student leaders from the Empower Poly Coalition, successfully founded a Cal Poly chapter of the Alliance to Save Energy's Green Campus Program. Green Campus student interns are working to save energy on campuses by building general campus awareness, incorporating energy conservation and efficiency into course curricula, and implementing projects targeting energy use, student purchasing decisions, operational changes and educational outreach. The Green Campus Program currently serves 12 University of California (UC) and California State University (CSU) campuses.

### ▼ SWANTON PACIFIC RANCH

Cal Poly's Swanton Pacific Ranch encompasses over 3,600 acres in Santa Cruz County. This resource allows for "learn by doing" experience in sustainable forestry, land management and organic farming. Approximately 1,600 acres of the ranch are operated as commercial timberlands. Cal Poly won the highest designation for responsible timber management from the international Forest Stewardship Council (FSC). All products are "green" and "green harvested," and are FSC certified. About 115 acres of the ranch are devoted to cropland, all in certified organic production. The ranch is also the site of numerous habitat restoration and enhancement projects.



# SUSTAINABILITY awards



## UC / CSU / CCC ENERGY EFFICIENCY PARTNERSHIP PROGRAM

### 2007

#### Best Practices in Traffic Demand Management

For Cal Poly's OPTIONS program to encourage alternative transportation modes

#### Best Practices in Water Efficiency

For Cal Poly's comprehensive water retrofit program

#### Best Practices in Renewable Energy

For rooftop solar PV array on Building 21

### 2008

#### Best Practices in New Construction

#### Best Overall Sustainable Design

For the Bonderson Engineering Projects Building

#### Best Practices in New Construction, HVAC

For the satellite central plant serving the new engineering buildings

#### Best Practices in Sustainable Operations, Waste Reduction

For Cal Poly's integrated waste management program, including on-campus composting

## SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT

### Pollution Reduction Award

For rooftop solar PV array on Building 21

### Warren Baker

*President*

### Larry Kelley

*VP of Administration & Finance*

### Mark Hunter

*Director, Facility Services*

### Other Contributors:

Bob Kitamura  
Joel Neel  
Dennis Elliot  
Doug Overman  
Tom Ramlar  
Mark Shelton  
Kim Busby  
Cheryl Mollan  
Susan Rains

Cindy Campbell

Jordan Young

Doug McIntyre

Academic Senate

Sustainability Committee

### Vice President's

### Sustainability Advisory Committee

### 2006-2007

R. Thomas Jones, *Chair*  
Zachary Austin  
Alan Cushman  
Mark Hunter  
Bob Kitamura  
Michael Marcus  
Bill McElroy

Robert Pena

Ron Skamfer

Linda Vanasupa

James Vilkitas

### 2007-2008

R. Thomas Jones, *Chair*  
Dwayne Brummett  
Alan Cushman  
Ben Eckold  
Adrienne Greve  
Mark Hunter  
Bob Kitamura  
Margot MacDonald  
Matthew Teresi  
Linda Vanasupa  
James Vilkitas

Mike Multari *Text*

Pamela Eidelman *Project Coordination*





WE SAVED: **58** fully grown trees, **2,769** lbs. of landfill, **4,679** lbs. of greenhouse gas emissions, **12,657** gallons of water and **26** million BTUs of energy

BY PRINTING THE CAL POLY SUSTAINABILITY REPORT

WITH SOY-BASED INKS ON 100% RECYCLED PAPER.



DESIGN BY BARNETT COX & ASSOCIATES  
PHOTOGRAPHY BY CHRIS LESCHINSKY

