

2011

UC Berkeley

Campus Sustainability Report

“Snapshots of Sustainability”



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University of California,
Berkeley

September 2011

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Campus Sustainability Report

UC Berkeley's renowned dedication to excellence does not stop at academics – it also translates into efforts to be an environmentally sustainable campus. At its core, the university's commitment to sustainability has always focused on public service, transparency, and excellence. As the program matures it is also acquiring a new focus on innovation, apparent in the cross-cutting programs and projects led by student, staff, faculty, and academic communities.



One area of innovation is using incentives as a way to achieve change and drive sustainability. The new Energy Management initiative will give campus units a financial incentive to save energy. By setting goals, displaying real-time information about how much electricity is being used, and sharing the savings, the initiative aims to reduce user-controlled consumption. Units can then use the savings from simple actions like turning off hallway lights, dimming monitors, and changing operating hours to fund new projects. Other programs that use carrots rather than sticks can provide recognition for taking extra steps (like the [green department](#) certification) or small grants that reduce the up-front costs of refrigerator replacements or videoconferencing.

This report of how UC Berkeley is turning sustainability into action highlights these projects and more. Besides reporting our sustainability metrics and featured projects, this year's report includes new "Sustainability Snapshots," designed to show more clearly the progress made toward our goals. Overall, the campus achievements in the last year are noteworthy:

- Chancellor Birgeneau committed to reducing potable water usage by 10% by 2020.
- By undertaking projects such as converting exterior lampposts to LED lights, the campus has reduced electricity usage by 14 million kilowatt-hours since 2006.
- We completed 6 more LEED™ certified building projects, bringing the campus total to 7.
- Cal Dining achieved Marine Stewardship Council certification for their seafood purchases.
- Transportation fuel usage is now 30% below 1990 levels, surpassing the campus goal.
- The campus recycling rate was 67%, reflecting successes in recycling across campus as well as newer efforts at football games and from construction and demolition.
- The successful Strawberry Creek Restoration Program opened a new native plant nursery.

And our students – who are our principal agents of change on sustainability – also have accomplishments to celebrate:

- The Berkeley Student Food Collective opened the doors to its new storefront in the fall.
- In its fourth year, The Green Initiative Fund has supported almost 50 campus projects with almost \$1 million in student fees.
- Students voted to end the sale of bottled water, and the Graduate Assembly passed an energy efficiency resolution.
- New energy efficiency and waste reductions projects were completed by the Berkeley Student Cooperative and at several Greek houses.

I'm pleased to share with you this report on the collective progress toward our goals. I'm confident that the growing culture of sustainability on campus will continue to move us forward in creative and effective ways.

John Wilton, Vice Chancellor, Administration and Finance

Sustainability Snapshots

The 2011 Campus Sustainability Report documents how well the campus has implemented projects to achieve our goals, initiated new best practices, and expanded the culture of sustainability. A new feature of the Report is the Sustainability Snapshots, which provide a succinct summary of current progress toward sustainability goals.

ENERGY & CLIMATE

GOALS

By 2014, reduce greenhouse gas emissions to 1990 levels

Achieve climate neutrality as soon as possible

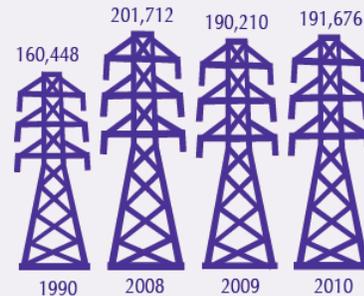
PROGRESS

The results of the preliminary UC Berkeley 2010 Greenhouse Gas Inventory reveals an increase in emissions of 0.8% or about 1,400 metric tons CO₂e relative to the 2009 inventory.

Even with this small increase in 2010, emissions are still 5% below 2008 levels.

SUSTAINABILITY SNAPSHOT

Total Greenhouse Gases (Metric tons Co2 eq.)



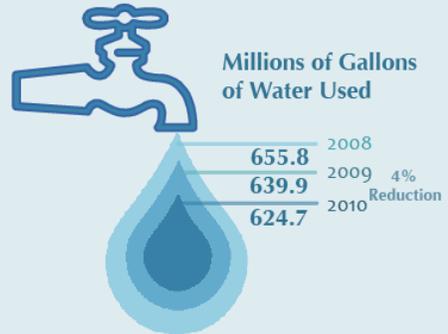
GOALS

Reduce potable water use to 10% below 2008 levels by 2020

PROGRESS

Total potable water usage (including residence halls) dropped 2.4% last year and is down 4.7% since 2008.

SUSTAINABILITY SNAPSHOT



WATER

GOALS

Design future projects to minimize energy and water consumption and wastewater production; incorporate sustainable design principles into capital investment decisions; base capital investment decisions on life cycle cost, including the cost of known future expenditures.

PROGRESS

The campus now has seven (7) LEED™ certified building projects. In addition, all major projects currently in the planning and design phase, as well as several projects now in construction, are registered with the Green Building Certification Institute and are expected to be LEED™ certified.

SUSTAINABILITY SNAPSHOT

Number of LEED™ Certified Building Projects on Campus



BUILT ENVIRONMENT

Sustainability Snapshots

WASTE

GOALS

Achieve a 75% diversion rate by June 2012 and zero waste by 2020

PROGRESS

The amount of solid waste sent to landfills remained steady in 2010. The diversion rate for campus is 67%, although the rate drops to 41% when construction waste is excluded.

SUSTAINABILITY SNAPSHOT



PURCHASING

GOALS

By 2011, develop a green purchasing policy

PROGRESS

The campus purchased at least \$6.3 million of environmentally-preferable products last year, and has increased the percentage of copy paper purchases that contain post-consumer waste to 81%.

The campus continues to expand the number of green products it purchases and to incorporate sustainability criteria in its contracts.

SUSTAINABILITY SNAPSHOT



TRANSPORTATION

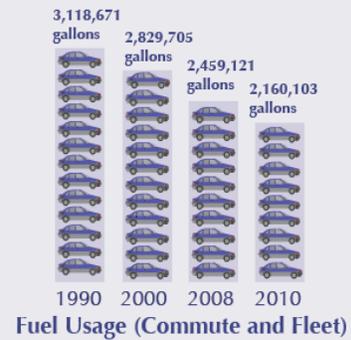
GOALS

By 2014, reduce fuel use by commuters and campus fleet to 25% below 1990 levels

PROGRESS

Last year, the campus achieved its goal of reducing fuel use from fleet and commute by 25% below 1990 levels. This year, fuel use is over 30% below 1990 levels.

SUSTAINABILITY SNAPSHOT



FOOD & HOUSING

GOALS

By 2020, increase sustainable food purchases by campus foodservice providers to at least 20%

PROGRESS

The percentage of purchases of sustainable food has gone up by almost three percentage points in the past year, and has exceeded the goal by 5%.

SUSTAINABILITY SNAPSHOT

Total Percentage of Sustainable Food Purchases



*Percentages include foods produced by locally-owned businesses

Across Campus

Current Conditions Across campus, UC Berkeley works to be more sustainable in the nine areas covered by this report, complemented by numerous campus-wide and administrative measures. These measures – campus committees and organizations, grants, communication tools, reports, and other similar initiatives – are a vital part of any sustainable institution and help define the culture of sustainability at UC Berkeley. The work over the years can be seen in the extent to which sustainability has been institutionalized on campus. One example is the nearly \$1 million of student fees awards by The Green Initiative Fund.

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the ability to meet the needs of the present while living within the carrying capacity of supporting ecosystems and without compromising the ability of future generations to meet their own needs

– Chancellor's Advisory Committee
on Sustainability

Across Campus At A Glance

- ✓ The [Chancellor's Advisory Committee on Sustainability](#) (CACS) was formed in 2003 and promotes environmental management and sustainability on campus. Membership is drawn from faculty, staff, students, and alumni. To date, CACS has awarded almost \$200,000 in grants and internships.
- ✓ CACS hosts an annual Sustainability Conference, presents annual [Sustainability Awards](#), and funds the [Chancellor's Green Fund Grants](#) and [CACS Internships](#).
- ✓ In 2009, the campus adopted its [2009 Campus Sustainability Plan](#) to define a vision of long term sustainability and describe steps being taken to achieve the vision.
- ✓ The [Office of Sustainability](#) – created in 2008 – publishes the [Bright Green News](#) newsletter, offers a sustainability tour, plans [Sustainability Forums](#) for student groups, and hosts four websites and a Facebook [page](#).
- ✓ In addition to the Office of Sustainability's two full-time staff and 5 to 7 student interns, there are additional campus staff working on sustainability-related issues, including energy efficiency, green buildings, grant coordination, and recycling.
- ✓ Number of certified [green departments](#): 9; Number of certified [green events](#): 59
- ✓ [The Green Initiative Fund](#) (TGIF) is a grant-making fund for sustainability projects on UC Berkeley's campus and has awarded \$956,540 to 48 different projects. In turn, these projects have resulted in 95 paid student internships.
- ✓ The [ASUC Sustainability Team](#) organizes the campus Earth Week, and multiple entities on campus regularly hold events during that time.
- ✓ EH&S maintains an [Environmental Management System](#) (EMS) that identifies the environmental aspects of UC Berkeley's activities in order to determine those which may have a significant impact on the environment.
- ✓ Recreation Sports writes a PlayGreen [blog](#) and has hosted three [PlayGreen Festivals](#).
- ✓ Health*Matters is a wellness program for faculty and staff, which integrates health and sustainability with the Eat Well Berkeley initiative, the Eat Green program, and a WalkGreen annual event.
- ✓ Sustainability information is shared with new students, faculty, and staff.
- ✓ There are at least seven (7) [Alameda County Green Businesses](#) on campus.
- ✓ The Vice Chancellor for Equity and Inclusion is charged with implementing the campus Strategic Plan for Diversity, Equity, and Inclusion ([Pathway To Excellence 2009](#)).
- ✓ UC Berkeley is a member of the [East Bay Green Corridor Partnership](#), which is committed to strengthening the regional green economy while reaching sustainability goals.

Across Campus

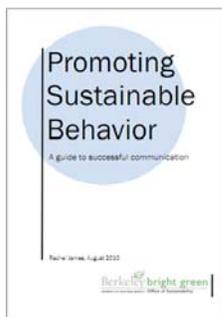
2010-2011 Features

Teaching, Learning, and Change (TLC) –Building a Campus Culture of Sustainability

Raising awareness and empowering the UC Berkeley community to make sustainable change require a broad array of communications methods. Through this year's Teaching, Learning, and Change campaign, the [Office of Sustainability](#) fostered new projects including a student multi-media communications production for the web and for the design of staff sustainability training and job shadowing programs to be piloted in Fall 2011. Follow sustainability star Tinker Bee in the "[UC Bee Sustainable](#)" multi-media video as she highlights student involvement in sustainable practices, and visit the new [Office of Sustainability Facebook page](#) to find up-to-date information on campus sustainability events.



Thinking Globally and Acting Locally with UC Berkeley's Earth Week 2011 This year, Earth Week included five days packed with sustainable activities, ranging from educational booths to the [8th annual CACS Sustainability Summit](#) where Chancellor Birgeneau announced the first water reduction goal for campus. Events began with 'Project Sustainable Lifestyle,' where students partook in trivia tests and "tap vs. bottled water" blindfolded tastings on Upper Sproul, a panel discussion on climate change policies and practices (hosted by STeam, the [ASUC Sustainability Team](#)), and a film showing on effective policies and technologies for combating climate change (co-sponsored by the ASUC and [Parking and Transportation](#)). STeam also held a "Live-Green Festival" featuring local sustainable eateries, businesses, and an Eco-fashion show, as well as a multimedia "Lectumentary" presentation by Black Lantern Synergy.



Helping Change Habits – A Guide for Promoting Sustainable Behavior

Taking a dynamic look at how to connect sustainable values to specific changes in behavior, the Office of Sustainability published the handbook, "[Promoting Sustainable Behavior, a guide to successful communication](#)"-designed to help improve environmental messaging. Rachel James, an intern from the [JARU Sustainability Fellowship program](#), developed the guide. It offers interesting and relevant examples from current research on social marketing on how to attract attention, to use persuasive messages, and to think carefully about audiences.

Students Making Sustainable Career Connections This year the [Career Center](#) and various environmental groups on campus sponsored the [Green Career Fair](#), providing a forum for employers addressing environmental concerns to meet with students seeking jobs in the green sector. Able to speak one-on-one with representatives from green organizations such as USDA Forest Service, Rising Sun Energy Center, and US Environmental Protection Agency, students from a wide array of academic disciplines attended the fair and learned more about green career opportunities.

Interesting Fact *31 individuals and groups have been recognized over the years by CACS for their contributions to making the campus more sustainable.*

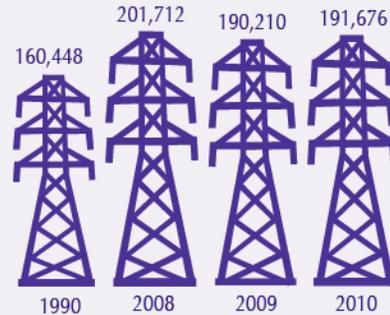
Energy & Climate

SUSTAINABILITY SNAPSHOT

Current Conditions The results of the preliminary UC Berkeley 2010 Greenhouse Gas Inventory reveal an increase in greenhouse gas (GHG) emissions of 0.8% or about 1,400 metric tons CO₂e (carbon dioxide equivalent) relative to the 2009 inventory. Even with this small increase in 2010, emissions are still almost 5% below 2008 levels. Electricity use in 2010 is down 1.1% on the main campus and 1.5% overall relative to 2009.

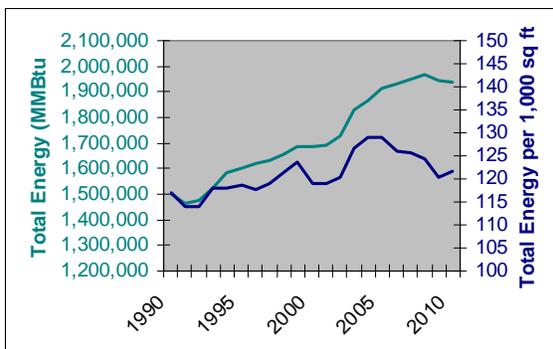
ENERGY & CLIMATE

Total Greenhouse Gases (Metric tons Co2 eq.)



Energy & Climate At A Glance

- ✓ UC Berkeley has set an emissions reduction goal that exceeds California state law (1990 levels by 2014) and includes a commitment to climate neutrality.
- ✓ UC Berkeley maintains an inventory of Scope 1, 2, and 3 greenhouse emissions.
- ✓ Scope 3 emissions sources include commute, business air travel, solid waste, water, and purchases (calculated separately).
- ✓ The top three sources of emissions are steam (41%), purchased electricity (31%), and business air travel (11%).
- ✓ UC Berkeley's [Cal Climate Action Partnership](#) (CalCAP) has identified energy saving projects that will reduce greenhouse gas emissions by about 30,000 metric tons CO₂e.
- ✓ The campus adopted a [Strategic Energy Plan](#) that identifies potential energy efficiency retrofit projects in all campus buildings over 50,000 square feet.
- ✓ The [Climate Action Fund](#) accepts donations to the campus effort to reduce greenhouse gas emissions.
- ✓ Steam heat is purchased from an on-campus, natural gas fired, co-generation plant.
- ✓ An energy management system that controls ventilation, temperature, lights, and operating hours is used in 70 buildings on the main campus.
- ✓ Residence hall competitions to reduce electricity consumption and CFL exchanges are held each semester.
- ✓ The student-run [Berkeley Energy Resources Collaborative](#) (BERC) hosts an annual energy symposium.



Total Energy Usage is Down Again (0.3%)... although usage per square foot¹ rose slightly, reversing the trend since 2005.

¹ See p. 38 for data on campus square footage and population.

Energy & Climate

Figure 1: Energy Usage & Greenhouse Gas Emissions at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Total greenhouse gases (metric tons CO ₂ eq.)	160,448	163,374	245,555	201,712	190,210	191,676
- GHG Scopes 1&2	110,450	116,445	201,867	157,058	148,611	148,538
Electricity (kWh)	157,105,948	171,709,091	185,666,952	217,841,461	218,515,767	215,307,772
Steam (MMBtu)	806,868	854,475	895,830	1,005,349	978,854	1,000,442
Natural gas (MMBtu)	156,301	162,123	155,331	221,141	219,401	202,515
Renewable energy (kW)				100	100	100
Renewable energy credits (metric tons CO ₂)					136	396

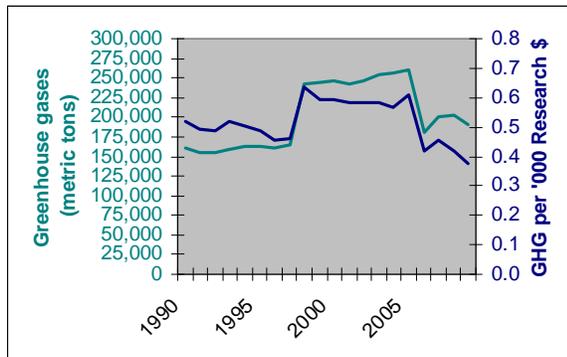
Greenhouse gases: "Total greenhouse gas emissions" (the basis for the campus reduction goal) includes Scope 1,2,&3 emissions. "GHG Scopes 1&2" includes direct and indirect emissions only (and excludes optional Source 3 emissions sources). Main changes are lower emissions from steam due to historical double-counting of some usage and differences in electricity emissions factors.

Electricity: Changes in electricity emissions factors for years 2006-2010 to conform to the Climate Registry's Best Practice Protocols.

Steam: Change is lower emissions due to historical double-counting of auxiliary boilers.

Renewable energy: Onsite renewable energy (kW) represents a photovoltaic installation on the student union. Change represents more accurate data.

Renewable energy credits: Credits purchased from third party to offset electricity emissions.



**GHG emissions are up 0.8%...
and emissions per thousand dollars of research
expenditures have dropped by 28% since 1990.**

Energy & Climate Goals

- **By 2014, reduce greenhouse gas emissions to 1990 levels (CalCAP)**
- **Achieve climate neutrality as soon as possible (CalCAP, UCOP)**

Key Strategies:

1. Reduce systemwide growth-adjusted energy consumption by 10% or more by 2014 from the year 2000 base consumption level. (UCOP)
2. Work on UC system goal to provide up to ten megawatts of local renewable power by 2014. (UCOP)
3. Procure 20% of electricity needs from renewable sources by 2010. (UCOP)
4. Develop a campus standard for sustainable design specific to our site, climate, and facility inventory. (LRDP)
5. Update the *Campus Design Standards* and set a campus-wide energy policy.
6. Implement strategies and actions identified in the UC Berkeley 2009 *Climate Action Plan* and future climate action plans.

7. Set next interim greenhouse gas emissions reduction target for 2020 or 2025.
8. Define climate neutrality and a target date for reaching neutrality.

Plans The 2009 and 2010 greenhouse gas emissions inventories will be reported to The Climate Registry and third-party verified. The CalCAP (Cal Climate Action Partnership) Steering Committee will continue to evaluate measures to meet the 2014 target, including the possible use of renewable energy credits and carbon offsets. Project implementation progress will continue to be documented on the CalCAP website.

The set of projects planned under the Strategic Energy Plan (SEP) for the coming year include [commissioning](#) for about 40 buildings, lighting projects in about 20 buildings, pool covers at Hearst Gym, steam manhole insulation, and more efficient chillers at Stanley Hall and Cory Hall.

The first phase of the [Operational Excellence Energy Management Initiative](#) has been funded by campus, and is expected to yield \$3-4 million in additional annual energy savings. A high-profile Energy Office will be tasked with overseeing many of the new initiatives and services being proposed. This Office will ensure ongoing commissioning of buildings and will work with existing Facility Managers to speed energy-related repairs and identify conservation measures/reduction projects. A companion program will provide financial incentives to reduce user-controlled electrical consumption by sharing energy savings with Operating Units. Another component is a campus 'save energy' outreach campaign to change individual behavior, aiming to make energy usage more visible and creating interesting, compelling, and consistent messages. The Energy Management Initiative will also establish and strengthen the campus energy policy to provide the administrative context for conservation.

There are also [TGIF](#)-funded projects that will reduce energy usage. One will install differential pressure transmitters on air handling units in eight buildings on campus to reduce the cost and frequency of filter replacements, and the other will hold an energy competition among the Greek Houses.

2010-2011 Features

Campus Energy Efficiency projects have now saved almost 14 million kWh Since 2006, the campus has funded multiple projects as part of its [Strategic Energy Plan](#) to reduce energy usage in new and existing campus buildings. As part of a partnership with PG&E, these projects are also expected to have saved close to 460,000 therms of natural gas annually, for an emissions reduction of about 6,800 tons and an annual cost saving of over \$1.8 million.

Metering and Commissioning: By the end of the summer, real-time metering will have been installed in about 50 campus buildings. The data from the meters are being used to reduce energy consumption through commissioning, and also to verify the energy savings. Commissioning has been completed for about 10 buildings, where energy savings have been achieved by adjusting building schedules and by tuning and replacing inefficient building mechanical equipment. As an example, the recently-completed commissioning project at the Haas Business School's three buildings earned a rebate of about \$120,000, and is saving the campus about \$50,000 a year.

Energy & Climate

Lighting Projects: Lighting projects primarily consist of the replacement of existing lamps and ballasts with more efficient components, but can also involve lamp standardization for ease of maintenance. Lighting projects may also include the installation of occupancy sensors and the removal of lamps where appropriate. Lighting projects have been completed in about 15 buildings, including backstage lighting in Zellerbach Hall and wirelessly controlled lighting being installed in Hearst Gym.



Campus Installs 800 Exterior LED Lamps Another SEP project changed the lights in all of the iconic exterior lampposts (approximately 800 fixtures) from metal halide bulbs to a LED array, a significantly more energy efficient and longer-lasting technology. The wattage in these fixtures dropped from 175 to 40 watts. The exterior lights are controlled by photocells and are operational only during the nighttime, but are used 365 days per year. This change will result in energy savings of almost 520,000 kWh and an annual cost savings of around \$55,000. At the same time, the light is considered better, safer, and sharper – check them out the next time you’re on campus at night. Photo credit: Judy Chess

CO Monitoring System For a Greener, Quieter Garage As part of the [Strategic Energy Plan](#), Parking & Transportation and Facilities Services installed a new carbon monoxide (CO) monitoring system in the Recreational Sports Facility parking garage. Six large exhaust fans used to run continuously, even at night and in the middle of the day when no exhaust fumes were being generated. Since installing the system, five of these fans now only turn on when needed. This effort will save energy, money, and allow the garage to operate more quietly¹.

Cal Energy Corps Offering Sustainable Energy Internships Launched in February 2011, [Cal Energy Corps](#) will send more than a dozen undergraduate students to places around the world each summer for internships focusing on sustainable energy and climate change. Participants spend up to ten weeks working with partner organizations either in the United States or overseas, contributing their talents to real-world projects. Projects this year range from studying the urban heat island effect at the Chinese University of Hong Kong, to focusing on biofuels from algae at the Indian Institute of Technology in Kharagpur. Photo credit: Roy Kaltschmidt



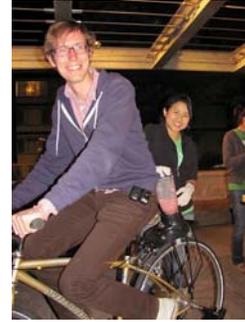
CalCAP Graduate Seminar Reports on Carbon Offset Recommendations In Spring 2010 the CalCAP course released a [final report](#) with recommendations to the campus on purchasing carbon offsets. The recommendations were developed to aid the campus in understanding and identifying the different types of carbon offsets, which might be needed to meet the campus carbon reduction goal. The recommendations identify carbon offset protocols recognized under the cap-and-trade program being designed by the CA Air Resources Board (ARB) as particularly relevant. The report additionally analyzes current and possible future projects to offset carbon such as a biogas plant, community weatherization projects, and ongoing campus research.

¹ Patrick MacArdle, “A Greener, Quieter Parking Garage,” [Bright Green News](#), May 2011, p.6.

Energy & Climate

“Blackout Battles” Energy Saving Competition Features Smoothie-Blending Bike

As part of a residence hall educational outreach effort and friendly competition between Units 1-4, the Blackout Battles got serious when students began making smoothies powered by the pedaling of a bicycle. Student group Green Campus received a *Brita Filter for Good* grant, supplementing the bike blending demo and offering the group another bike, resulting in one-on-one “bike blend-offs.” In addition to other energy saving methods such as exchanging light bulbs, shutting down or sleeping computers when not in use, and using cold water for laundry, this was quite an innovative way to ramp up the green competition.² Photo credit: Felicia Tan



UC Berkeley Ties for First Place in the Great Power Race At the UN Climate Change Conference in December 2010, it was announced that UC Berkeley tied for first place with the University of South Carolina in the Great Power Race, a clean energy competition between over 1,000 college campuses in India, China and the United States. Student sustainability leaders



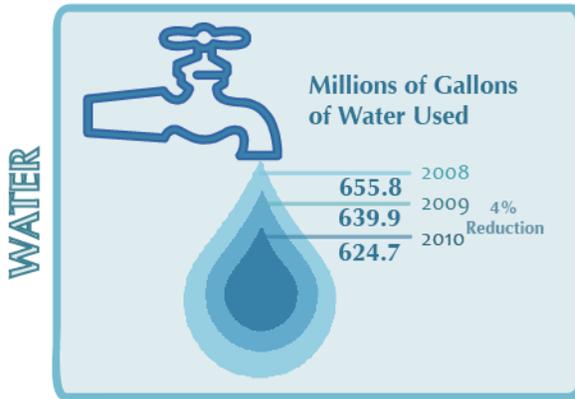
formed the UC Berkeley Team and showcased ongoing campus initiatives in areas such as energy efficiency, water conservation, and biodiversity. One of the far-reaching projects that contributed to the win was CALPIRG’s successful “No on [Prop 23](#)” campaign, educating over 13,000 students across campus. Numerous other initiatives and projects in 15 categories can be viewed on [Berkeley's Great Power Race website](#). Photo credit: Omead Kohanteb

Interesting Fact In March 2011, the [Graduate Assembly \(GA\) Resolution 1102g](#) was unanimously ratified by GA Delegates. This resolution seeks to implement a campus-wide energy efficiency target for UC Berkeley, guiding the reduction of energy consumption across all campus buildings to 20% below 2009 levels by 2014.

² “More Bike-Powered Smoothies, Thanks to Brita,” Green Campus Chronicles, March 2011.

Water

SUSTAINABILITY SNAPSHOT



Current Conditions Total potable water usage (including residence halls) dropped 2.4% last year and is down 4.7% since 2008. In April, the campus set its first water reduction goal, committing to reduce potable water use to 10% below 2008 levels by 2020.

Water At A Glance

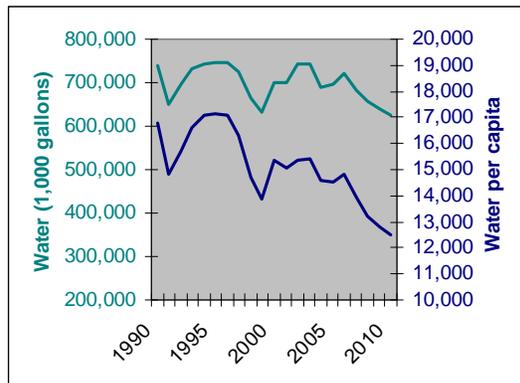
- ✓ The Chancellor's Advisory Committee on Sustainability has completed [research on campus water usage](#), which reports total water usage (including residence halls) and a feasibility study of water efficiency projects.
- ✓ New construction and major renovation projects will maximize the number of water use reduction credits as part of the LEED™ certification process.
- ✓ Over 90% of irrigation systems are automated and connected to a weather station.
- ✓ There are eleven (11) water bottle refill stations on campus and at least nine (9) more are being installed.
- ✓ [I Heart Tap Water](#), a partnership between Cal Dining, Recreational Sports, Environment, Health & Safety (EH&S), and University Health Services promotes tap water as the preferred beverage of choice and educates the campus through a website, Facebook, posters, and an on-line pledge to make a difference.
- ✓ The Campus implements Stormwater Pollution Prevention Plans for all campus construction projects to manage stormwater runoff and protect water quality.

Figure 2: Water Usage at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Water (millions of gallons)	739.3	744.8	698.7	655.8	639.9	624.7
Wastewater (millions of gallons)	546.7	512.2	473.9	457.3	451.7	452.8

Water and Wastewater: Changes reflect inclusion of residence halls and corrected data from the utility.

Water



*Water Use Dropped 15.5% since 1990...
and usage per capita has dropped by over 25%
in the same time period.*

Water Goal

Reduce potable water use to 10% below 2008 levels by 2020

Key Strategies:

1. Double the water use reduction target if the local utility provides a non-potable source of water for irrigation.
2. Convene a steering committee composed of faculty, staff, and students to conduct a feasibility study and an analysis of possible projects and targets.
3. Identify and implement cost-effective water projects, especially those that also reduce campus energy use.
4. Include at least two Water Efficiency Credits as mandatory credits for new construction projects.

Plans The Chancellor's Advisory Committee on Sustainability will work with Physical Plant-Campus Services and Capital Projects to fund and implement the high-priority projects that are needed to reach the potable water reduction goal. In addition, there are multiple grant-funded water projects underway on campus: installing low-flow shower valves and educational signs in Unit 3, installing up to five hydration stations in locations such as Evans, Stanley, Boalt, and University Hall, installing electronic metering and a weather station for better water management in campus irrigation systems, and updating sprinkler heads in the Botanical Gardens to reduce water use for irrigation and decrease runoff into Strawberry Creek.

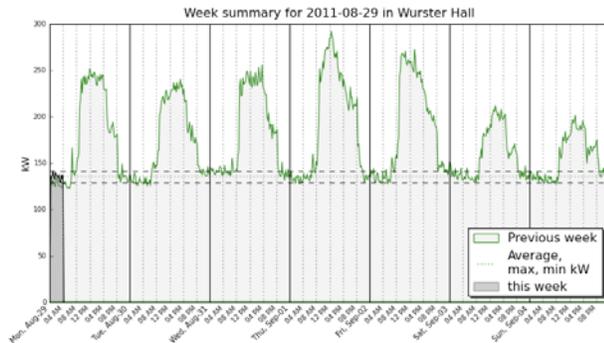
2010-2011 Features

Chancellor Sets First Campus-Wide Water Reduction Goal At the 2011 Chancellor's Advisory Committee on Sustainability (CACS) 8th Annual Summit, Chancellor Birgeneau announced the first water reduction goal for the campus, committing to reduce potable water use to 10% below 2008 levels by 2020. The Chancellor additionally committed to double this target if the local utility can provide a non-potable source for irrigation. A study prepared by CACS identified \$1.6 million dollars in cost-effective central campus water reduction projects – saving \$250,000 in annual utility costs. Planned implementation projects include upgrading domestic fixtures to lower-flow, repairing leaks, and encouraging water conservation.

Water

Water Improvements Come with LEED™ Renovations Two recent LEED™ certified projects made notable changes to the way water is sourced and used. University Village in Albany is now piped to utilize recycled or reclaimed water for irrigation once the local municipal water agency makes it available (currently scheduled for 2012). Another one of the finished LEED™ renovations, Morgan Hall Laboratory, reduced its expected water usage by over 40% with new water saving technology/low flow installments.

Real-time Water Metering Informs Campus Water Conservation Efforts [Berkeley's Water Metering Project](#) has been in full swing since 2009, aiming to achieve real-time online monitoring of water consumed in campus buildings. Phase 2 began this year by expanding the metering to include eight more buildings in its efforts to target the most wasteful facilities and conserve water by upgrading bathroom fixtures on campus to ultra-high efficiency. A thorough audit was performed in Wurster Hall to find that 72% of toilets and 69% of urinals use 4 to 6 gallons instead of their rated 1.6 gallons per flush, leading to the installation of six sub-meters and the replacement of ten of the most wasteful fixtures.



ASUC Water Referendum Vote Passes In this year's ASUC student elections, Berkeley students voted over 5 to 1 in favor of the "End the Sale of Bottled Water Initiative." Part of an effort to reduce waste and encourage students to refill reusable canteens, the referendum requested the renegotiation of existing campus contracts to "phase out" the sale of bottled water and better maintenance of water fountains and more hydration stations.



New and Easy to Find Hydration Stations [I Heart Tap Water](#) promotes education about the health and sustainability benefits of drinking tap water and seeks to make improvements to campus infrastructure by increasing accessibility to water bottle refill stations. Sales of bottled water have decreased by 50% since 2006. Using a 2010 TGIF grant, Capital Projects developed design standards for refill stations, and a new station was installed in Dwinelle Hall. You can now find all refill locations and campus

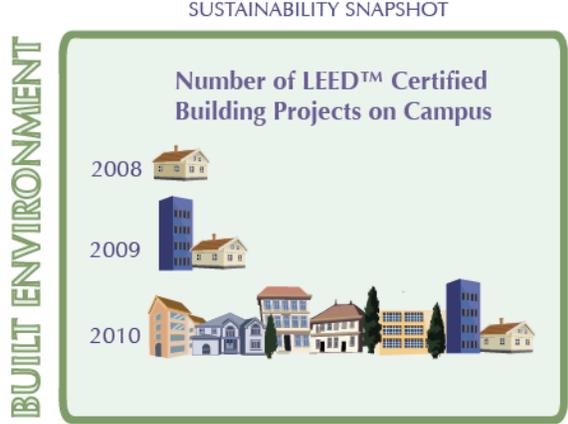
drinking fountains on [Googlemaps](#). Photo credit: Annie Frantzeskos

Quotable *"Ultimately, water is one of the most precious commodities – in spite of the fact that after all the rain this year the reservoirs filled up – in the long run fresh, safe water is one of our most important quantities which we must preserve"* –Chancellor Birgeneau

Built Environment

Current Conditions The campus now has seven (7) LEED™ certified building projects, representing 5.1% of total square footage. In addition, all major projects currently in the planning and design phase, as well as several projects now in construction, are registered with the Green Building Certification Institute and are expected to be LEED™ certified.

The campus received over \$190,000 between 2010 and 2011 from PG&E, the local utility that administers the Savings by Design program for energy savings in new construction. In addition to these three projects, there are presently ten more in design and under construction that are expected to generate additional energy savings over the next several years.



Built Environment At A Glance

- ✓ UC Berkeley has three Gold certified LEED™ building projects (Commercial Interiors), three Silver LEED™ certified projects (New Construction), and one Certified building project (New Construction). There are an additional ten building projects that are in review, design, or construction.
- ✓ As of 2010, there are at least ten LEED™ accredited professionals on campus. Several members of the campus community, including both students and staff, are actively pursuing LEED™ EBOM professional accreditation; as of July 2010 at least three students and one staff have achieved this.
- ✓ The student-run [Building Sustainability @ Cal](#) program has developed sustainability plans for at least 25 campus buildings.
- ✓ Indoor air quality questions and complaints are handled by a full-time industrial hygienist.

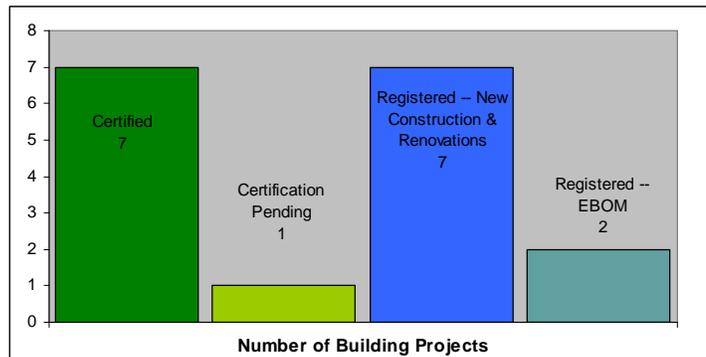
Figure 3: Green Buildings at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
LEED™ buildings (#/square footage)				1 / 11,068 ft ²	2 / 112,042 ft ²	7 / 807,968 ft ²

LEED™ buildings: Gross square footage for certified building projects from Judy Chess, personal communication, May 31, 2011.

Built Environment

Campus has seven LEED™ certified building projects and 10 more in various stages of planning or construction.



Built Environment Goals

- **Design future projects to minimize energy and water consumption and wastewater production (LRDP)**
- **Incorporate sustainable design principles into capital investment decisions (LRDP)**
- **Base capital investment decisions on life cycle cost, including the cost of known future expenditures (LRDP)**

Key Strategies:

1. All new building projects [will] outperform the required provisions of the California Energy Code ([Title 24](#)) energy-efficiency standards by at least 20%. (UCOP)
2. Design and build all new buildings to a minimum standard equivalent to a LEED™ V.3 Silver rating, and strive to achieve a standard equivalent to a LEED™ Gold rating or higher, whenever possible within the constraints of program needs and standard budget parameters. (UCOP)
3. Design and build all new laboratory buildings to the same LEED™ standard and/or the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC), as appropriate. (UCOP)
4. Large renovation projects [as defined by UCOP] should at minimum comply with UC equivalent to LEED™ Commercial Interiors or New Construction certified rating and register with Savings by Design program. (UCOP)
5. Submit one pilot building for LEED™ Existing Buildings certification.
6. Include at least two LEED™ Water Efficiency Credits as mandatory credits for new construction projects.
7. Investigate the Volume Certification approach to LEED™ Existing Buildings.
8. Maximize use of monitoring-based commissioning as a tool to reduce building energy use.

Plans Campus construction projects generally follow the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED™) system for green building performance, and major projects are designed to achieve a minimum of LEED™ Silver. For laboratory construction and renovation, campus designers consult the Labs 21 performance criteria. New building and major renovation projects are required to outperform local energy codes by at least 20%, and routine and smaller renovations are required to conform to energy codes and to apply energy efficiency principles, budget and program permitting. Though not mandated, the campus encourages innovation in specific projects around the use of low-flow

Built Environment

plumbing fixtures and use of weather sensitive irrigation systems. As a result, most construction projects readily achieve credits in the Water Efficiency category.

For renovation projects below the threshold of the system-wide policy (renovations that do not replace 100% of the building systems), the campus does not presently monitor energy code compliance; however, it is beginning an effort to track energy performance for these projects. This includes strategies for improved documentation and transparency of performance expectations and accountability.

2010-2011 Features

An Outstanding Year for LEED Certified Building Projects at UC Berkeley In the past year, six UC Berkeley projects received green building certification through the US Green Building Council's LEED™ (Leadership in Energy and Environmental Design) process, bringing the total completed LEED™ certified projects on campus to seven. Accomplishments include the construction and completion of University Village, Renewal Phases 1 and 2 of Clark Kerr Campus, Morgan Hall Laboratory, Durant Hall, and Blum Center.

LEED™ is a standard measure of the sustainable features of buildings and is awarded at different levels according to a rating system that evaluates a building's environmental attributes and sustainable features. The LEED™ designation confirms that these projects all meet the rigorous requirements for green performance in several areas, including land use and site development, efficient use of resources (water, energy and building materials), and are designed to provide superior indoor environmental quality for campus occupants.

Historic Landmark – Durant Hall (LEED™ Silver)

Replacing outdated building systems with energy-efficient technologies, the upgrades in Durant duly honored both history and sustainability. This project had an innovative approach and sought to illuminate indoor spaces through natural light by large windows, glass walls, floors, and ceilings, as well as transparent office dividers that allow light to come into the core of the building. Other green features include a high waste diversion rate, indoor paints and sealants with a minimal “off-gassing” of indoor pollutants, dual flush toilets and low flow faucets, and 92% of all wood based materials harvested from forests certified as sustainable.



Student Housing Clark Kerr Campus Renewal: Phases 1 and 2 (LEED™ Gold)



Renovations included the installation of new water-efficient fixtures, (expecting to reduce water use by more than 30%), the use of low VOC (volatile organic compound) emitting materials including paints, carpets and wood furniture, the purchase of Energy Star® appliances for the buildings, and new bike storage room additions.

Both the Clark Kerr Campus and Durant Hall are nationally recognized historic structures and the coordination of green building values with campus historic preservation goals proved to be a challenge successfully met.

Built Environment

Student Family Housing – University Village (LEED™ Certified)



Green features of this project include hydronic heating, increased insulation, fluorescent lighting, and gas dryers in naturally ventilated apartment buildings. Both University Village and Clark Kerr Campus were developed by the Residential & Student Service Programs (RSSP). RSSP is a campus leader in green building and sustainable practices with three LEED certified projects developed and one more

– Anna Head West Student Housing – underway.

First LEED™ Certified Lab on Campus – Morgan Hall Lab Renovation (LEED™ Gold)

Opened in June 2010, this project renovated former office and storage spaces to create modern, efficient and sustainable labs for the Department of Nutritional Science & Toxicology in the College of Natural Resources. Morgan Hall is the campus's very first LEED™ certified laboratory. New sustainable fixtures include a video educating the community about the project and offering instruction to lab occupants on how to use the space, and high levels of occupant systems controllability.



Historic Naval Architecture Building – Newly Constructed Blum Center (LEED™ Silver)

On the National Register of Historic Places, the Naval Architecture Building is now a more seismically and environmentally sound Blum Center, housing the Center for Developing Economies and the Department of Systems Innovation and Engineering (SIE). The building was constructed using building materials such as an asphalt shingle roof, aluminum sun shades, insulated glazing and [Forest Stewardship Council](#)-certified cedar wood panels.

Berkeley Co-op Green Renovations The Berkeley Student Cooperative (BSC) has always been a leader in sustainability and energy efficiency efforts, and during Summer 2011 co-op Kingman Hall will take the extra steps to reduce the building's greenhouse gas emissions by 40 percent. Funded through energy savings and alumni donations, renovations will include replacing the current heating and air conditioning system with high-efficiency features, adding insulation, retrofitting windows in the common area and installing thermostat-controlled showerheads. These retrofits are part of the BSC's overarching effort to make all twenty of their buildings more energy efficient by 2020. Photo credit: Anna Vignet



Interesting Fact/Quotable *Students from the Building Sustainability @ Cal program have helped campus building projects achieve LEED™ credits for Innovation and Education, transportation, and water conservation. Students have been instrumental in LEED™ certifications in half of all the LEED™ certified projects!*

Waste

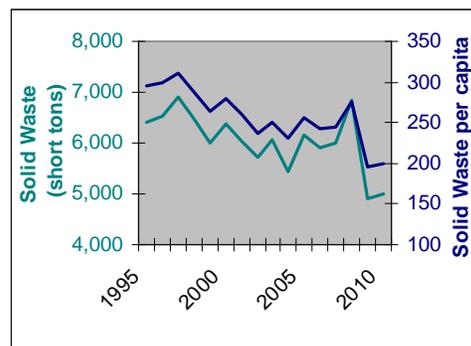
Current Conditions The amount of solid waste sent to landfills by the campus remained steady in 2010. The campus policy to increase diversion of construction and demolition waste has been successful, although the number and scope of such projects varies from year to year. The diversion rate for campus is 67%, although the rate drops to 41% when the construction waste is excluded. Hazardous waste generation rose 40% since last year, but remains below historical levels.



Waste At A Glance

- ✓ The campus currently [recycles](#) mixed paper, newspaper, magazines and books, cardboard, beverage containers, toner and ink jet cartridges, electronic waste, plastic film, plastic pipette containers, metal, motor oil, tires, and batteries. The campus currently [composts](#) a portion of food waste, compostable kitchenware, green and wood waste, and pallets.
- ✓ The campus also works to reuse office supplies, equipment, and vehicles through the [Overstock and Surplus Den](#).
- ✓ Funded by the [Campus Recycling and Refuse Services](#), the student-managed [ReUSE](#) program (which includes an on-line exchange) operates 16 on-campus reuse stations for office supplies, and runs the annual Second Chance clothing sales and reader giveaways. In total, ReUSE projects reduce waste by 2-5 tons each year.
- ✓ ReUSE has also operated the [Online Materials Exchange](#) since 2009, facilitating direct exchanges of used items between campus affiliates.
- ✓ Construction contracts include a requirement that waste must be tracked and that there be a 50% minimum diversion rate.
- ✓ The campus has a hazardous waste and waste minimization plan that includes e-waste.
- ✓ The campus no longer prints a phone directory, maintaining only an on-line version.
- ✓ The College of Chemistry runs an exchange that traded 1,200 chemical items last year.

Solid Waste has dropped 23% since 1995...and waste per capita has decreased even faster (33%).



Waste

Figure 4: Solid Waste at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Municipal solid waste (MSW) (short tons)		6,414	6,385	6,838	4,913	5,001
Diverted waste (short tons)		1,705	3,157	121,975	38,783	10,123
- Recycled waste		1,705	2,374	2,226	2,316	1,962
- Construction waste				118,394	35,249	6,835
- Composting			783	1,354	1,218	1,326
Diversion rate (%)		21%	33%	40%/95%	42%/89%	41%/67%
Hazardous Waste (tons)		801	341	138.5	194.6	n/a

Waste data is from Campus Recycling & Refuse Services.

Municipal solid waste (MSW): All waste sent to a landfill, excluding hazardous. All data now being reported on a fiscal year basis. Estimated data for 1990 are no longer being reported.

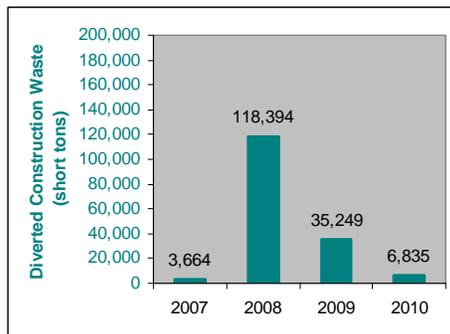
Diverted waste: Includes recycled, reused, and source-reduced waste, construction waste, and composting.

Recycled waste: Data for 1995 is corrected from previous reports.

Construction waste: Waste sent to a landfill/diverted from a landfill from construction and demolition sources. Waste from some construction projects may not be included. Not reported or not reported separately until 2007. This includes waste from some general campus operations.

Diversion rate: The higher number is the percentage of all MSW that was diverted from a landfill; the lower number excludes construction waste. Previous reports included diversion rates for academic years.

Hazardous waste: Variations in hazardous waste due to construction projects. Source: Multiple EH&S Hazardous Waste Source Reduction and Management Reviews. 2010 data is not yet available.



Waste Diverted from Construction and Demolition Projects varies from year to year.

Waste Goals

Achieve a 75% diversion rate by June 2012 and zero waste by 2020 (UCOP)

Key Strategies:

1. Fund and implement the CalCAP project to expand the campus composting program.
2. Continue to increase mixed paper recycling from campus buildings, and improve support, tracking, and reporting of recycling of construction and demolition materials.
3. Add more recycling and composting bins in buildings and grounds areas.
4. Improve collection, signage, and equipment systems to divert more recyclable and compostable materials.
5. Increase education and outreach to reduce waste, divert more recyclables and compostables, and eliminate contamination.

Waste

Plans There are numerous waste reduction projects planned for the coming year. There will be a BYOM (Bring Your Own Mug) campaign to reduce purchase of single-use coffee cups, as well as an effort to place recycling bins in student rooms. The Compost Alliance will design and implement a composting system in a number of campus buildings, as well as audit waste streams and increase waste reduction awareness. A student group will work to reduce the volume of solid waste from the Cal Greek community through composting, recycling and the ReUSE program, while a staff group will provide a full-range of composting and glass and plastic recycling in Durant.

The Chancellor's Advisory Committee on Sustainability has hired a student Waste Diversion Research Intern to research and develop a white paper on a campus waste diversion strategy to help the campus reach its goal of zero waste by 2020. The white paper will identify concrete ways – through improved recycling and composting and other strategies – for the campus to reach the near term diversion goal, while setting a course for zero-waste.

Environment, Health, & Safety (EH&S) will start tracking hazardous waste by laboratory. By increasing awareness of the volume of waste created, this data is expected to reduce total generation. In addition, EH&S will continue a training program on the bench-top treatment of hazardous waste to reduce the amount that is packaged and shipped for treatment.

2010-2011 Features

CLI E-Waste Works to Recycle Electronics and Educate Dedicated to improving electronic waste disposal efforts among the UC Berkeley community, the [Cal Leadership Institute's \(CLI\) E-Waste student group](#) partnered with Cal Dining and Cal Overstock and Surplus to recycle old cell phones, batteries, old ink cartridges, printers, CDs, and even old computers. This initiative seeks to educate students on the importance of e-waste recycling (since e-waste makes up 70% of all toxic waste in landfills, with over 50 million tons generated a year). You can find their RED e-waste disposal bins at Golden Bear Café, Ramona's, Terrace Café, Pat Brown's, Common Grounds, and Pro Shop.

Berkeley's Greek Community Implements Recycling Program Student organization [Greening the Greeks](#) used a TGIF grant to outfit ten fraternity houses with recycling receptacles. To evaluate the program's progress, two sorority members heading the project have taken on the duty of emptying unsorted frat-house trash and assessing its contents every two weeks at each of the enrolled fraternities. This year's initial successes are showing a 15% to 25% reduction in avoidable waste.



Thanks to the efforts of these two waste-reduction aware students, many more bottles, cans, paper, and cardboard boxes are being recycled weekly. Photo credit: Kelley Doyle

ReUSE Hosts Reader and Clothing Give-Aways The [ReUSE](#) program “functions to foster the spirit of reusing materials rather than throwing them away.” By offering students, faculty and staff ReUSE stations to donate used readers, clothes, office supplies, and e-waste, the Berkeley community is able to freely exchange reusable goods, instead of sending them to the land fill. The group recently revamped and revved up their Online Materials Exchange [website](#), where anyone with a CalNet ID can give away or claim useful items for free.

Waste

The Berkeley Project Day 2010—A Large Certified green event This year's Berkeley Project



Day was a certified **green event**, a testament to the fact that community service and sustainability go hand in hand. Complete with compost bins during breakfast and opening ceremonies, the event minimized waste with the support of an Office of Sustainability TGIF-funded grant for composting services. Volunteers contributed over 16,000 hours of service, lending helping hands to numerous environment-focused projects such as tree planting, trail restoration projects, and beautification of the Berkeley Marina. The Green Operations (GO) Team also made composting and recycling easy, helping event attendees properly dispose of their waste.³

Photo credit: Kira Stoll

Cal Athletics Reduces Football Game Waste with New Recycling Efforts The Athletic Department participated in the Environmental Protection Agency's [Gameday Challenge](#),

implementing a new recycling program in the Fall 2010 football season. For three games in Fall, beginning with the Golden Bear's game against UCLA in October, recycling bins and student volunteers from the Greening Operations (GO!) Team were placed strategically through the Fan Zone at Memorial Stadium gates. The Team helped collect fans' recyclables and educate attendees about diverting their waste. Thanks to the Athletic department's efforts, 33% of waste was recycled and diverted from the landfill. Photo credit: Laura Waters



California Hall Begins Paper Towel Composting Coordinating with building occupants, and janitorial staff leaders, the Cal Hall Green Team and [Building Sustainability @ Cal's](#) students initiated a paper towel composting program in the spring of 2011. With help from Manager of Special Projects and Facilities Manager for the Office of the Chancellor Dee Middleton, BS@C students were able to order bins and biodegradable bags to install the first ever building-wide paper towel recycling program, in hopes that 45 gallons of paper would be composted per day, equating to 129.4 kg of carbon emissions diverted annually. The project will also calculate actual waste consumption and diversion.⁴

Interesting Fact/Quotable *Over 80% of certified green events have composted.*

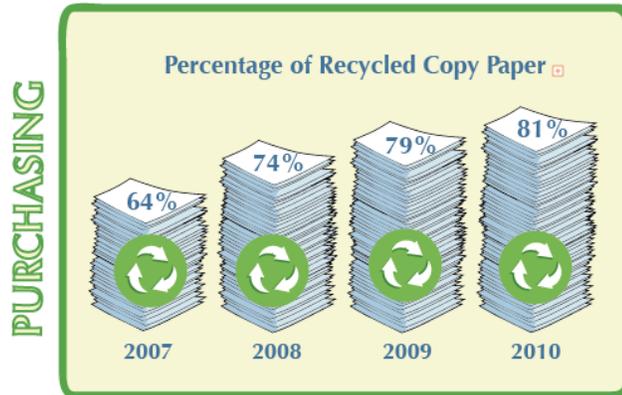
³ Tammi Liu, "Berkeley Project Day 2010 – A Certified Large Green Event," [Bright Green News](#), Nov/Dec 2010, p. 4.

⁴ Claire Evans, Sruti Bharat, and Katya Cherukumilli. BS@C Spring 2010 Final Report. http://www.facilities.berkeley.edu/GreenBuildings/Resources/FinalReport_Spring2010_BuildingSustainability-At-Cal.pdf

Purchasing

SUSTAINABILITY SNAPSHOT

Current Conditions The campus purchased at least \$6.3 million of environmentally-preferable products last year, and has increased the percentage of copy paper purchases that contain post-consumer waste to 81%. The campus continues to expand the number of green products it purchases and to incorporate sustainability criteria in its contracts.



Purchasing At A Glance

- ✓ UC Berkeley participates in the system-wide Strategic Sourcing program that is responsible for the planned negotiation and management of [University-wide agreements](#), and the development and oversight of policies governing purchasing activities, material management, and equipment management. Strategic Sourcing also strives to incorporate environmentally friendly products and services.
- ✓ The University of California’s [“Policy on Sustainable Practices”](#) includes requirements on preferential purchases of Energy Star equipment, recycled content products, and other third party certified green items, along with guidance on packaging waste and takeback programs.
- ✓ UC Berkeley has developed [Sustainable Copy Paper Guidelines](#).
- ✓ Physical Plant-Campus Services completed documentation of a new Green Cleaning Policy that outlines sustainability criteria for cleaning products, supplies, tools, equipment, and practices at UC Berkeley.
- ✓ Procurement Services’ Supplier Diversity Program promotes business relationships and contract opportunities for small, local, and diverse businesses wishing to provide goods and services to the University community.

Figure 5: Green Purchasing at UC Berkeley, 1990-2010

	1990	1995	2007	2008	2009	2010
Total green purchasing (\$)			\$1.5 million	\$6.1 million	\$6.3 million	n/a
Recycled paper purchases (% of total copy, fine, and computer paper purchases)			64%	74%	79%	81%

Total green purchasing: Data from UCOP. Includes Energy Star, EPEAT, Green Guard, Green Seal, and recycled content from system-wide contracts only. Some green purchases may not have been included in this total due to inadequate reporting by some vendors. Data are for fiscal years. Data for FY 2010-2011 are not yet available.

Recycled paper: 2007 data from 4/07 – 3/08 for OfficeMax and Radstons; 2008 data from 6/08 – 5/09 for OfficeMax and Radstons; 2009 data from 7/09 – 6/10 for OfficeMax only; 2010 data from 1/10-12/10 for OfficeMax only. All data are based on cost, for paper with a 30% or higher post-consumer recycled content.

Interesting Fact 29% of office supplies purchased by campus had recycled content.

Purchasing Goal

By 2011, develop a green purchasing policy

Key Strategies:

1. Preferential purchase of Energy Star® appliances and equipment, with energy efficiency and conservation features enabled. (UCOP)
2. Standard of 30% post consumer waste (PCW) recycled content paper for office use and 100% PCW recycled content for uncut paper, including janitorial supplies. (UCOP)
3. Increase the procurement of other products with high recycled content. (UCOP)
4. Work to phase in Green Seal Products. (UCOP)
5. Purchase electronics products that have achieved EPEAT registration. (UCOP)
6. Minimize packaging waste. (UCOP)
7. Establish take-back programs for packaging of electronics and other products and give preference to take-back programs that are provided free of charge. (UCOP)

Plans Procurement Services will soon roll out a new [eProcurement](#) system – BearBuy.

Besides increasing the purchases of environmentally-preferable products, this new procurement system will also reduce campus paper usage by processing documents like purchase orders and invoices electronically. Concurrently, the campus will also develop a green purchasing policy. Working with PP-CS and Research Enterprises Services, Procurement Services will pilot a reusable bin delivery system for office supplies.

2010-2011 Features

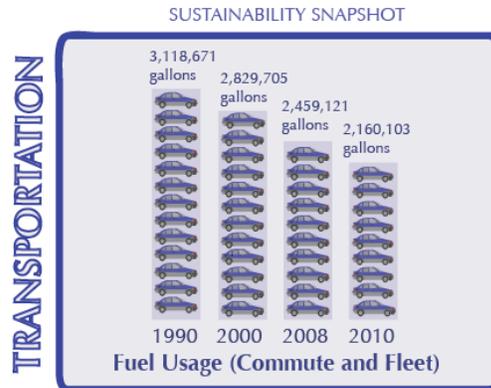
Cal Student Store Makes Green Additions This year [Cal Student Store](#) – the one-stop-shop for Berkeley students – switched to “Green Books” made with 100 percent recycled paper (30 percent of it post-consumer waste), completely replacing its blue counterpart. To encourage sustainable practices, the store held a month-long raffle for customers who brought their own reusable shopping bag. They also now rent selected course texts, which will save students money and extend the useful life of a textbook by renting it over several years to multiple people.

Student Store Also Stocks Sustainable and Socially Just Cal Gear In addition to the many other sustainable and recycled class supplies sold, the Cal Student store has begun to offer more sustainable clothing, stocking the Knight’s Apparel [Alta Gracia](#) brand Cal gear. This new socially responsible clothing factory is stationed in the Dominican Republic, dedicated to providing its factory workers with freedom from poverty through job creation and education. Alta Gracia was developed in cooperation with labor rights organizations such as the Worker Rights Consortium, which verifies the workers payment of a living wage. In similar fashion, this year’s graduating class sported graduation regalia made with compostable materials from fiber from renewable, managed forests.

Cal Dining Achieves Sustainable Seafood Certification Five years after becoming the first university dining program in the country to earn organic certification, Cal Dining has again raised the sustainability bar and become the first public university to earn [Marine Stewardship Council](#) (MSC) certification. This “Chain of Custody” certification ensures that Cal Dining is purchasing seafood that sources back to a sustainable fishery. Working to promote the health of oceans and fish populations and reward fisheries that operate sustainably, MSC provides an ‘ecolabel’ which will soon appear on menus and at food stations in the Cal Dining commons.

Transportation

Current Conditions Last year, the campus achieved its goal of reducing fuel use from fleet and commute by 25% below 1990 levels. With the reductions achieved this year, fuel use is over 30% below 1990 levels. Air travel emissions grew by 11.2% in 2010 relative to 2009. The number of trips grew by 2,300 in 2010, and air travel was at an all time high for the campus.



Transportation At A Glance

- ✓ UC Berkeley offers a comprehensive package of programs to encourage the use of alternative transportation, with the goal of reducing traffic and parking demands. The [New Directions](#) program offers a suite of attractive alternative commute benefits to UC Berkeley faculty, staff, and students. The program offers universal bus pass programs, transit subsidies, discounted carpool parking pricing, pre-tax purchases, a regional ride-matching service, and a host of other benefits and incentives.
- ✓ The campus has completed most of high priority infrastructure projects identified in the [2006 Campus Bicycle Plan](#) and regularly participates in Bike to Work Day.
- ✓ The campus currently has 4,350 bike parking spaces, having recently added 650. This includes indoor storage in at least two buildings and four parking garages.
- ✓ As of May 2011, the campus owns 572 fleet vehicles, 122 (or 21%) of which are considered green.
- ✓ UC Berkeley has a variety of car sharing services on or just adjacent to campus, including City CarShare, Zipcar, Zimride, and Enterprise Rent-a-Car.

Figure 6: Transportation at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Transportation						
Fuel usage – commute and fleet (gallons)	3,118,671	3,009,282	2,829,705	2,459,121	2,222,294	2,160,103
Vehicle miles traveled – commute	59,216,106	58,170,774	54,990,752	50,661,749	45,407,467	44,410,823
Vehicle miles traveled – fleet				2,075,851	2,132,149	1,864,609
Drive alone rate, faculty/staff (%)	60.0%	54.6%	50.2%	47.1%	43.1%	43.1%
Drive alone rate, students (%)	10.7%	11.8%	8.2%	7.1%	7.1%	7.1%
Green fleet (%)				10.9%	17.9%	21.4%
Air travel (miles)				116,892,152	110,519,178	122,942,318

Fuel usage: Includes gasoline for commutes; includes gasoline, diesel, E85, and biodiesel for fleet.

Vehicle miles traveled – fleet: Includes all fleet and shuttle vehicles.

Drive-alone rates: Determined through campus surveys every three years.

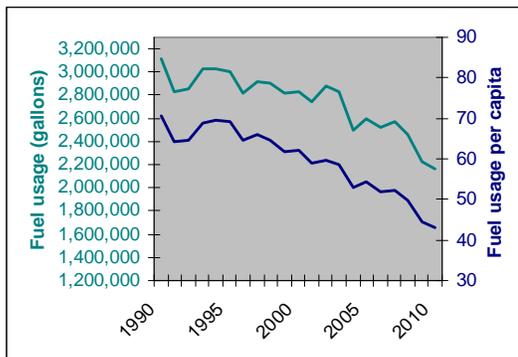
Green fleet: Includes categories of vehicles as defined in the Energy Policy Act (various) plus hybrid vehicles. Source: Fleet Services.

Transportation

Figure 7: Alternative Mode Splits at UC Berkeley, 1990-2009

	1990/1992	2000/2001	2005/2006	2008/2009
Faculty and Staff	1990	2001	2006	2009
Walk	12.0%	8.4%	7.7%	9.0%
Transit	12.0%	17.8%	24.3%	25.2%
Bicycle	5.0%	9.5%	7.5%	9.1%
Rideshare	10.0%	9.1%	11.5%	11.8%
Other	1.0%	4.0%	1.9%	1.8%
Students	1992	2000	2005	2008
Walk	45.5%	53.5%	46.8%	54.9%
Transit	18.8%	23.0%	31.9%	24.2%
Bicycle	16.7%	8.7%	9.4%	10.8%
Rideshare	4.4%	1.8%	2.7%	1.9%
Other	3.9%	2.3%	1.2%	1.1%

Mode Splits: Transportation surveys, which are used to estimate mode splits, are only conducted every three years.



*Fuel Usage Dropped in 2010 by 2.8%...
and usage per capita has dropped
by 39.0% since 1990.*

Transportation Goal

By 2014, reduce fuel use by commuters and campus fleet to 25% below 1990 levels

Key Strategies:

1. 25% of all fleet vehicles to be green by 2014. (CalCAP)
2. Reduce demand for parking through incentives for alternate travel modes. (LRDP)
3. Locate all new University housing within a mile or within 20 minutes of campus by transit. (LRDP)
4. Implement a program of strategic investment in campus pedestrian and bicycle routes. (LRDP)
5. Continue strategic bicycle access planning. (LRDP EIR)
6. Develop a strategic pedestrian improvement plan. (LRDP EIR)
7. Investigate initiatives to reduce greenhouse gas emissions from business air travel.

Transportation

Plans The campus completed a Parking and Transportation Demand Management Master Plan that articulates policies that reduce the demand for driving and parking while enhancing the sustainable commute programs for faculty, staff, and students. The Parking and Transportation department is employing various strategies identified to accomplish this such as exploring expansion of car-share programs and hiring a Transportation Demand Manager to implement elements of the plan. Other future projects include a grant to reduce circling while searching for empty parking spots and a project with the Safe Traffic Research and Education Center on pedestrian and bike safety along the campus periphery.

Fleet Services will continue to work towards the goal of having 25% of the fleet green by 2014 and will also be implementing a car-sharing program for fleet vehicles as part of the campus Operational Excellence program. A TGIF-funded grant, the Campus Bicycle Initiative, will provide an educational campaign aimed at increasing bicycling as a mode of transportation, through safety training and the expansion of services offered by BicyCAL.

2010-2011 Features

BicyCAL Student Cooperative Opens Its New Hub Offering “peer-to-peer” bike-maintenance and education, [BicyCAL](#) members have opened their doors for business. Located up the stairway connecting upper and lower Sproul Plaza (upper entrance located just behind the Golden Bear Café), members offer mechanical know-how and emphasize do-it-yourself information. A 2009 TGIF grant made the new central bike-repair hub possible, and BicyCAL hopes to create a campus bike-sharing program down the road.

New Ethanol and Hydrogen Fuel Cell-Powered Campus Vehicles on Campus Last year the campus converted garbage trucks to run on biodiesel fuel, and now for the first time selected Fleet vehicles have been fueled with E85 ethanol fuel. Four departments have started using the fuel, and it is anticipated that ethanol use will spread to additional departments this coming year, displacing a portion of gasoline consumption by fleet vehicles. Additionally, the percentage of miles driven by highly efficient vehicles (30+ mpg) increased, due to the utilization of hybrid vehicles. There are also now four hydrogen fuel cell research vehicles.



Grad student-created iPhone Application Allows Public Transit to go Viral The “[Transporter](#)” application integrates route information and real-time arrival data of local Bay Area public transit. Hoping to eliminate a sense of anxiety about using public transit identified by participants in Bay Area interviews, Berkeley graduate student Ljuba Miljkovic created Transporter to support many features, such as finding out the arrival time of the buses or trains. The application won Berkeley’s James R. Chen Award and is available on [iTunes](#). Photo credit: Ljuba Miljkovic

Transportation

Travel-Free Meeting Grant Program to Reduce Business Travel The Office of Sustainability launched the [Travel-Free Meeting Grant Program](#) through funding from its Climate Action Fund in March 2011, promoting the use of campus videoconferencing and web-based meeting tools. Hoping to increase awareness about the impacts of business air travel and reduce the number of UC Berkeley's business air trips by 10% in the next two years, grants of up to \$100 have been made for groups hosting a ReadyTalk Web meeting, holding videoconferences at the campus facilities, or purchasing a computer camera for Skyping or desktop web-conferencing.

Capital Projects Adds Bicycles to their Fleet Capital Projects staff do a lot of travel between offices and job sites, and this year they added a three-speed bicycle to their vehicle fleet at the request of employees seeking more environmentally friendly transportation options. The bike proved popular and viable, and now they plan to add a second. The Environment, Health & Safety department has had a bicycle transportation option for staff for several years – they are currently up to four bikes in the fleet. The first was purchased with a CACS Green Fund grant, and the other three were donated.

Interesting Fact 84% of faculty, staff, and students (adjusting the combined mode split rates for relative population size) commute by walking, biking, ridesharing, or public transit.

Food & Housing

Current Conditions Campus vendors continue to show leadership in their percentage of purchases of sustainable food, which has gone up by almost three percentage points in the past year (to 25%). For the first time, the reported data include Cal Dining and two additional foodservice vendors.

FOOD & HOUSING

SUSTAINABILITY SNAPSHOT



Food & Housing At A Glance

- ✓ [Cal Dining](#) has four 100% certified organic salad bars; offers pre- and post-consumer composting in its kitchens and dining halls; sells its waste oil to be converted to biodiesel; has trayless dining at all locations; offers compostable containers, kitchenware, and cups; offers a discount for reusable coffee cups; uses 100% organic milk in dining halls and 100% organic eggs in all facilities; ensures 75% of entrees are vegetarian; partners with Buy Fresh, Buy Local and Community Alliance with Family Farmers; and donates food to a non-profit family shelter.
- ✓ Cal Dining's food is 99.9% free of trans fat and hydrogenated oils.
- ✓ The [UC Berkeley Sustainable Foodservices Working Group](#) is implementing a workplan to achieve the sustainable food purchase goal for campus vendors.
- ✓ The [ASUC Sustainability Team](#) runs The Local, a organic vegetable and fruit stand.
- ✓ The Eat Well Berkeley initiative integrates sustainable food practices with nutrition guidelines for healthier meetings, vending machines, catering, and restaurants.
- ✓ The [Residential Sustainability Program](#) (RSP) – a student-run program in the campus residence halls that promotes sustainable living through peer education – has initiated and supported a variety of programs, including Sustainability Week and Earth Week activities, paper towel composting projects, Clean Plate Clean Planet, and an Urban Camper Campaign.
- ✓ The [Global Environment Theme House](#) brings together students and faculty to explore issues around environmental change, natural resources, sustainable environments, and environmental leadership. The Theme House also includes the [Green Suite, Green Apartment, and Green Room](#) demonstration areas.
- ✓ Since 2006, the [Residential Student Services Program](#) has offered the [Cal Move-Out Program](#) in partnership with several campus and community groups. The program includes reader and clothing drives and the Bear-ly Used program that offers free pickups of larger, reusable items, and e-waste bins. The 2011 Cal Move-Out effort collected over 230 tons and diverted 90% of it.

Food & Housing

Figure 8: Sustainable Food Purchasing at UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Total sustainable purchases (%)				24%	22%/27%	25%/32%

Total Sustainable Food: Data for 2008 are from Cal Dining only, using the Real Food Challenge criteria. Data for 2009 are from Cal Dining only; 2010 data from Cal Dining and two additional campus foodservice vendors. For 2009 and 2010: first number includes purchases that are locally grown, organic, fair trade, or humane. Second number also includes purchases produced by locally-owned businesses.

Food & Dining Goal

By 2020, increase sustainable food purchases by campus foodservice providers to at least 20% (UCOP)

Key Strategies:

1. By December 2009, complete a report that sets sustainable foodservice practices goals, addresses plans to achieve these goals, and shows the feasibility of including self-operated or contract operations; provide a yearly progress report on these goals starting July 2010. (UCOP)
2. Provide student patrons access to educational materials that will help support their food choices. (UCOP)
3. Engage in activities with the surrounding community that support common goals regarding sustainability. (UCOP)
4. Encourage the use of third-party “green business” certifications for sustainable dining operations. (UCOP)
5. Expand membership of UC Berkeley’s Sustainable Food Subcommittee and establish regular meetings to set goals and review progress.

Plans The UC Berkeley Sustainable Foodservices working group will again query all campus vendors and report on sustainable food purchases to the UC Office of the President. Cal Dining plans to verify their sustainable food purchases through the Real Food Challenge, continue to investigate the use of reusable to-go containers in their dining halls, and implement LeanPath (a food waste tracking system). Two CACS grants will focus on sustainability in residence halls. “My Little Green Primers” will provide information on how to reduce waste, conserve water and purchase green to every incoming student in campus housing, and the “Recycling Can-Do” project will place recycling bins in student rooms. Health*Matters will host a 4-week “Eat Green” series and has taken the lead on coordinating Food Day activities on campus.

2010-2011 Features

Greening the Greek Housing System Green Campus interns performed a residential audit of the AOPi Sorority house, with the goals of energy efficiency and water conservation in mind. They identified several areas for improvement, including simple retrofits such as replacement of incandescent light bulbs with compact fluorescent lighting, and larger-scale projects like enhancing insulation and making behavioral changes.

Food & Housing

Get Your Sustainable Bite On at the Newly Opened Student-Run Food Cooperative

The [Berkeley Student Food Collective \(BSFC\)](#) officially opened its doors on Bancroft Way in November 2010, reflecting an 18-month effort to bring healthier and sustainable eating alternatives to UC Berkeley. The co-op's journey initially began as an alternative to a proposed campus fast food establishment. Carrying fresh, healthy, environmentally sustainable, local and ethically produced food at affordable prices, BSFC is incorporated as a nonprofit organization and run by member volunteers who make decisions through a democratic process. Photo Credit: Kira Stoll



Berkeley Team Helps Bring Locally-Farmed Berries to Sacramento Schools Through the UC Division of Agriculture and Natural Resources (ANR), a Berkeley team works with the UC Cooperative Extension researchers to make eating local a reality for Sacramento school children. The ["Farm to School"](#) program is an interdisciplinary academic group focused on education and research in areas ranging from food production to consumption. Guided by Dr. Jennifer Sowerwine's research team, the innovative new program involves the convergence of local small family farms and school cafeterias, where children are given fresh fruit that is oftentimes not available to them at home.

Alternative Spring Break Trip Looks at Food Justice and Local Farming Eleven Berkeley students spent their spring break learning about food justice issues and performing hands-on work at local Bay Area farms. Through the Cal Corps Public Service Center, this student-led [Alternative Spring Break](#) program named "Food for Thought" began with a semester-long [DeCal](#) exploring food accessibility, environmental impacts of conventional farming, political impacts of patenting, and the relation of food to the community. The students traveled to five Bay Area farms active in the local food movement and sustainable agricultural, performing duties ranging from hoeing and pruning seedlings to building chicken shelters. Photo credit: Emily Gilson



UCB Journalism Students Produce Multi-Media Account of Urban Bee Project Students from Berkeley's School of Journalism captured the importance of bees to food systems and to local urban gardens in their multi-media ["Backyard Buzz"](#) project. The project uses video footage, facts, and photos to highlight the value of bees both in agriculture and in gardens. The most effective pollinators in the world, bees pollinate at least one-third of temperate vegetable, fruit and nut crops, as well as most wildland flowers; however, bee populations are in decline due to habitat destruction. The [Urban Bee Project](#) works out of a lab at UC Berkeley, observing native bees and their favorite flowers and offering information on how to attract some of the 81 known bee species local to urban Berkeley.

Interesting Fact *GoodGuide – a company founded by Prof. Dara O'Rourke to evaluate the health, environmental, and social performance of products and companies – has rated almost 19,000 products in at least 11 different food categories.*

Land Use

Current Conditions In recent years, the campus has converted almost 40,000 square feet of turf grass area to native or drought tolerant species or to permeable surfaces, reducing the need for irrigation. UC Berkeley continues to implement the relevant portions of the [2020 Long Range Development Plan](#), including those in the Sustainable Campus section. Efforts also continue on the implementation of the [Strawberry Creek Management Plan](#).

Land Use At A Glance

- ✓ The [2020 Long Range Development Plan](#) (LRDP) describes a framework for land use and investment to meet the academic goals and objectives of the University. The companion [Environmental Impact Report](#) provides information on the environmental implications of the LRDP and includes an extended treatment of potential impacts and mitigation best practices. Importantly, the LRDP delineates a comprehensive approach for achieving a sustainable campus and has been amended to require that the campus design all aspects of new projects to achieve our short- and long-term greenhouse gas emissions reduction goals.
- ✓ Implementation of the 1987 [Strawberry Creek Management Plan](#) has significantly improved water quality.
- ✓ The [Strawberry Creek Restoration Program](#) begun in 1987, aims to eliminate harmful discharges to the Creek and provides hands-on training in restoration for university and K-12 students. The program also works to restore three designated Natural Areas on Campus (the Grinnell, the Goodspeed, and the Wickson) through weed removal and native plant re-vegetation. The Strawberry Creek Restoration Program thrives today due to the donated labor and funds of Cal students, staff, and faculty as well as alumni and campus neighbors.
- ✓ There is a native plant nursery and garden to support the restoration of Strawberry Creek.
- ✓ At the Richmond Field Station, the campus has finished restoration of five acres of salt marsh habitat and maintenance of upland coastal prairie with the assistance of over seventy student interns completing independent studies in ecological restoration.
- ✓ The campus has a written Integrated Pest Management plan, which aims to reduce the use of pesticides on all campus grounds.

Land Use Goal

Plan every new project to serve as a model of resource conservation and environmental stewardship (LRDP)

Key Strategies:

1. Implement an ongoing program of investment to restore and renew the campus park landscape; implement a program of strategic investment in new and enhanced campus open park spaces. (LRDP)
2. Continue to manage runoff into storm drain systems such that the aggregate effect of projects implementing the 2020 LRDP is no net increase in runoff over existing conditions. (LRDP EIR)

Land Use

3. Continue to revise and implement the Strawberry Creek Management Plan (SCMP) to include recommendations for habitat restoration and enhancement along specific segments of the creek. (LRDP EIR)
4. Continue to implement an urban runoff management program as published in the Strawberry Creek Management Plan. (LRDP EIR)
5. Manage the natural preserves based on ecological principles, including replacing invasive exotic plants with native plants suited to this biotic zone, replacing unhealthy plants and plants at the ends of their natural lives, and preserving and enhancing the habitat value of the zone. (LRDP)
6. Manage the hill campus landscape to reduce fire and flood risk and restore native vegetation and hydrology patterns. (LRDP)
7. Preserve the character and livability of the city around UC Berkeley, and enhance the economic and cultural synergy of city and university. (LRDP)
8. Provide housing, access, and services to promote full engagement in campus life; increase undergraduate bed spaces to equal 100% of entering freshmen plus 50% of sophomores and entering transfer students by 2020. (LRDP)

Plans Three TGIF grants will focus on land and land use related issues. One will install electronic metering and a weather station for better water management in campus irrigation systems. A second will purchase a system for detecting mercury during EH&S clean-ups and in lab demolition and will train staff to use the new technology. The third will continue the habitat restoration efforts for Strawberry Creek.

2010-2011 Features

Strawberry Creek Restoration Project Opened Native Plant Nursery The [Strawberry Creek Restoration Program](#) (SCRCP) collaborates with students, faculty, and community members to cultivate the creek's natural biodiversity, removing the non-native plants such as ivy that jeopardize the health of native plants and wildlife. In May, Student Restoration Leaders and co-sponsors Engineers for a Sustainable World and the Office of Environment, Health, & Safety

launched the [Strawberry Creek Native Plant Nursery](#) (SCNPN), where they are growing locally sourced native plants for placement within the Campus Natural Areas. Photo credit: Cathy Cockrell



Land Use

Urban Organic Garden Provides Students with an “Outdoor Learning Lab” Berkeley’s Student Organic Garden teaches more than just gardening skills – it offers students the chance to learn about innovative solutions to social challenges, including the lack of equitable access by urban communities to nutritious, healthy foods. Located just west of the Berkeley campus, the garden has become home to students tackling this issue, asking how much food could be grown in urban Oakland and why there are natural food “deserts” in Oakland. Graduate student Nathan McClintock’s Urban Food Project works within the garden, seeking to answer these questions and engage Cal students in developing a body of research to create equitable food policy.⁵

UC Botanical Garden Adopts New Eco-Friendly Fertilizing Method

The Botanical Garden begun using a new sustainable “compost tea” brewed from high-grade organic vegetable matter as an alternative fertilizer. The tea provides nutrients to the plants, reduces water use, helps suppress disease, and reduces plants’ reliance on synthetic fertilizers. These changed gardening methods help to further the efforts of the Strawberry Creek Restoration Program, reducing the pollution to the creek’s South Fork and helping to restore quality of the stream’s water and health of wildlife and native plants.

Photo credit: Eugene W. Lau



Interesting Fact *The campus has decreased impervious area by approximately 11,000 square feet over the last five years.*

⁵ Kate Rix, “Urban Farm a Classroom for Equitable Food Policy,” College of Letters and Science [website](#).

Academics & Learning by Doing

Current Conditions The degree, course, and service learning options offered at UC Berkeley allow students to increase their understanding of the complex issue of sustainability. Cutting-edge research contributes to finding solutions to existing problems and expands learning outcomes. Grants, class projects, and student organizations help tie what is learned in the classroom and the lab to real world outcomes.

Academics & Learning by Doing At A Glance

- ✓ The campus offers over 450 environment and sustainability courses; at least 10% of departments offer at least one of these courses. A full listing is available on the [BIE Enviro Portal](#).
- ✓ The campus also offers a range of DeCals – classes created and facilitated by students – including the Joy of Garbage and an Energy DeCal.
- ✓ The campus offers over 30 [undergraduate programs](#) related to the environment or sustainability and over 50 [graduate degree programs](#). Full listings are available on the BIE Enviro Portal.
- ✓ The Berkeley Institute of the Environment also maintains a current list of environment- and sustainability-related [research](#).
- ✓ [UNEX](#) has an extensive range of sustainability-related courses and programs, including sustainable design, energy for sustainability, and environmental monitoring.
- ✓ There are over 25 student groups active on sustainability-related issues.

Plans While there are numerous on-going and new research projects on campus related to sustainability, the Office of the Vice Chancellor for Research is offering two new programs. One, Berkeley Energy and Climate Lectures will offer awards to faculty who develop new survey courses on related topics. In addition, the Energy and Climate Research Innovation Seed Fund will fund projects that advance UC Berkeley research in the renewable energy and energy efficiency domain. In the coming year, the Office of Sustainability will offer a Teaching, Learning, and Change module that includes in-depth staff training on campus sustainability issues. In addition, two TGIF grants will fund student-led projects to create an interactive web-based campus sustainability map and to establish a green certification for student groups. Next year, a Alternative Spring Break trip focused on Environmental Justice issues will be offered.

2010-2011 Features

Berkeley Law and the Energy and Resources Group (ERG) Create Concurrent Degree

Students are now able to earn both a J.D and an M.S. or M.A. ERG degree after four years of study through a Concurrent Master's Program. Interest in energy-related legal work means increased job opportunities for graduates, and this program will explore the synergies between the two fields. ERG works within science, policy, and business communities to tackle issues in clean energy, climate change, ecosystems, and biodiversity, while the Law School had one of the first environmental law programs in the country. The cross-disciplinary program will admit its first students in Fall 2011.⁶

⁶ Andrew Cohen, "Berkeley Law Creates Concurrent Degree with Campus Energy Group," [Berkeley Law website](#).

Berkeley Leads in Green Chemistry The [Berkeley Center for Green Chemistry](#) promotes activities critical to achieving sustainability and aims to develop greener chemical products. This year the center successfully redesigned lab experiments for Berkeley's introductory chemistry classes, supported a student seminar on green chemistry, added new labs for Chemistry 4A and 4B, and has worked to develop three new advanced graduate-level chemistry classes. Now Chem1A labs on campus include numerous experiments investigating topics such as bio-fuels and ocean acidification, with overall goals of waste reduction, "using fewer nasty chemicals, while teaching students how chemistry can be used to solve problems."⁷

Energy Biosciences Institute (EBI) Releases Life-Cycle Assessment Report on Biofuels In Spring 2011 the EBI (a partnership between UC Berkeley, Lawrence Berkeley National Lab, the University of Illinois, and BP), released a report addressing the social, economic, and environmental challenges presented by biofuels. By taking a "life-cycle perspective," this report titled "[Grand Challenges for Life-Cycle Assessment of Biofuels](#)" delved into the seven grand challenges that need to be considered in order to effectively evaluate the environmental impacts of biofuels.

Feeding the Desire for a Course in Food Politics In Fall 2011, a new course called Edible Education: the Rise and Future of the Food Movement will debut, centering on food systems and food politics from a variety of perspectives. Co-taught by the executive director of People's Grocery Nikki Henderson, and the Journalism school's Michael Pollan, author of *The Omnivore's Dilemma*, the course has gotten lots of buzz for its hot topic content and robust guest speaker list. It is organized and funded by Alice Waters's Chez Panisse Foundation, open to undergrads, grad students and Berkeley community members who want to dig into issues of food justice, food security and a good food education.

Interesting Fact *The Joy of Garbage is the longest running DeCal class.*

⁷ Robert Sanders, "Green Chemistry in the lab and beyond," UC Berkeley NewsCenter, March 22, 2011.

Sustainability Goals

The Campus Sustainability Goals and many of the key strategies for meeting them are outlined in the [2009 Campus Sustainability Plan](#) (July 2009), although the campus more recently set the reduction target for water. The 2009 Plan draws from the below campus planning resources, which are also referenced in each topical section.

- The [Cal Climate Action Partnership](#) (CalCAP) manages our greenhouse gas emissions reduction goal and action plan.
- Portions of the [2020 Long Range Development Plan](#) (LRDP) for UC Berkeley – and its accompanying [Environmental Impact Report](#) (LRDP EIR) – are included in the 2009 Plan, but more details on how UC Berkeley is reducing its broader environmental impacts are available in the documents themselves.
- The [University of California “Policy on Sustainable Practices”](#) (UCOP) outlines the system-wide efforts to minimize environmental impacts and increase usage of renewable energy.
- The [Strawberry Creek Management Plan](#) (SCMP) continues to improve water quality in Strawberry Creek and provides hands-on training in restoration for university and K-12 students.

Campus Sustainability Goals	
Energy & Climate	By 2014, reduce greenhouse gas emissions to 1990 levels. (CalCAP) Achieve climate neutrality as soon as possible. (CalCAP, UCOP)
Water	Reduce potable water use to 10% below 2008 levels by 2020.
Built Environment	Design future projects to minimize energy and water consumption and wastewater production; incorporate sustainable design principles into capital investment decisions; base capital investment decisions on life cycle cost, including the cost of known future expenditures. (LRDP)
Waste	Achieve a 75% diversion rate by June 2012 and zero waste by 2020. (UCOP)
Purchasing	By 2011, develop a green purchasing policy.
Transportation	By 2014, reduce fuel use by commuters and campus fleet to 25% below 1990 levels.
Food & Dining	By 2020, increase sustainable food purchases by campus foodservice providers to at least 20%. (UCOP)
Land Use	Plan every new project to serve as a model of resource conservation and environmental stewardship. (LRDP)

Sustainability Metrics

UC Berkeley is committed to accurately reporting on progress toward achieving its sustainability goals. To that end, the campus developed a set of Sustainability Metrics that were first reported in the [2008 Campus Sustainability Assessment](#). In addition to reporting the absolute changes over time in the relevant metrics, the current Report also provides context for the data, shares why changes have occurred, and calculates normalized metrics.

Normalizing data – which is similar to averaging – is a common way to allow better comparability over time or with other institutions, by eliminating the effect of a normalizing factor from a data series. For example, in a given year the campus might implement energy efficiency measures, but also tear down a building. Normalizing the data for the total size of buildings – calculating the **electricity efficiency** by dividing electricity usage by gross square footage – can show how much of the resulting decrease in usage was due to the upgrades versus the demolition. Electricity efficiency also allows the campus to benchmark our energy usage to other campuses, since it is a size-neutral calculation.

In addition to normalizing by square footage, the Report also presents some data per capita and per dollar of expenditures on research. Choosing and defining these factors is not always straightforward. This report uses **gross square footage** (rather than assignable space) since this includes building space like hallways that also require energy to operate. The report has also chosen to define **population** (for per capital calculations) as the total of students, faculty, and staff. Part-time faculty and staff are included as partial full-time equivalents (FTE). Finally, **research** expenditures are the total expenditures in a fiscal year for institutes, research centers, and individual or project research, minus eliminated capital expenditures⁸.

While this Report concentrates on traditional environmental indicators – such as energy and water usage – UC Berkeley separately reports on **social and economic measures of sustainability**. These additional gauges of sustainability are reported through the [University of California Annual Accountability Report 2011](#). The report includes data on affordability and learning outcomes, student satisfaction, as well as diversity, research, and budget.

Most of the data and metrics in this Report are from the annual greenhouse gas emissions inventories compiled by the Cal Climate Action Partnership (CalCAP). Non-CalCAP **data sources** are referenced separately. Some data can change from year to year, due to improvements in the accuracy and precision of underlying data and methodologies. These changes are documented below and on the [CalCAP](#) website. Additional metrics will be evaluated for inclusion in future reports.

⁸ <http://controller.berkeley.edu/FINRPTS/FinancialSchedules.htm>, accessed July 22, 2010. Data are reported in the starting year of the fiscal year (e.g., FY 2008-2009 is reported as 2008).

Sustainability Metrics

Annual Sustainability Metrics for UC Berkeley, 1990-2010

	1990	1995	2000	2008	2009	2010
Energy & Climate						
Total greenhouse gases (metric tons CO ₂ eq.)	160,448	163,374	245,555	201,712	190,210	191,676
- GHG Scopes 1&2	110,450	116,445	201,867	157,058	148,611	148,538
Electricity (kWh)	157,105,948	171,709,091	185,666,952	217,841,461	218,515,767	215,307,772
Steam (MMBtu)	806,868	854,475	895,830	1,005,349	978,854	1,000,442
Natural gas (MMBtu)	156,301	162,123	155,331	221,141	219,401	202,515
Renewable energy (kW)				100	100	100
Renewable energy credits (metric tons CO ₂)					136	396
Water						
Water (millions of gallons)	739.3	744.8	698.7	655.8	639.9	624.7
Wastewater (millions of gallons)	546.7	512.2	473.9	457.3	451.7	452.8
Built Environment						
LEED™ buildings (#/square footage)				1 / 11,068 ft ²	2 / 112,042 ft ²	7 / 807,968 ft ²
Waste						
Municipal solid waste (MSW) (short tons)		6,414	6,385	6,838	4,913	5,001
Diverted waste (short tons)		1,705	3,157	121,975	38,783	10,123
- Recycled waste		1,705	2,374	2,226	2,316	1,962
- Construction waste				118,394	35,249	6,835
- Composting			783	1,354	1,218	1,326
Diversion rate (%)		21%	33%	40%/95%	42%/89%	41%/67%
Hazardous Waste (tons)		801	341	138.5	194.6	n/a
Transportation						
Fuel usage – commute and fleet (gallons)	3,118,671	3,009,282	2,829,705	2,459,121	2,222,294	2,160,103
Vehicle miles traveled – commute	59,216,106	58,170,774	54,990,752	50,661,749	45,407,467	44,410,823
Vehicle miles traveled – fleet				2,075,851	2,132,149	1,864,609
Drive alone rate, faculty/staff (%)	60.0%	54.6%	50.2%	47.1%	43.1%	43.1%
Drive alone rate, students (%)	10.7%	11.8%	8.2%	7.1%	7.1%	7.1%
Green fleet (%)				10.9%	17.9%	21.4%
Air travel (miles)				116,892,152	110,519,178	122,942,318
Food						
Total sustainable purchases (%)				24%	22%/27%	25%/32%
Other						
Population	44,120	43,509	45,565	49,567	50,013	50,085
Gross Square footage	12,817,517	13,520,471	14,145,728	15,838,197	16,149,539	15,941,137
Research	\$309,755,000	\$333,613,000	\$415,408,000	\$480,123,999	\$508,059,000	\$524,733,000

Sustainability Metrics

Annual Sustainability Metrics: Sources and Changes from Previous Reports

All data from 2010 CalCAP inventory (August 5, 2011 version) unless otherwise noted (<http://calcap.berkeley.edu>). All data are calendar unless otherwise noted; if fiscal year, data year reported in the starting year of the fiscal year (e.g., FY 2008-2009 is reported as 2008). Most waste data is from Campus Recycling & Refuse Services.

Greenhouse gases: “Total greenhouse gas emissions” (the basis for the campus reduction goal) includes Scope 1,2,&3 emissions. “GHG Scopes 1&2” includes direct and indirect emissions only (and excludes optional Source 3 emissions sources). Main changes are lower emissions from steam due to historical double-counting of some usage and differences in electricity emissions factors.

Electricity: Changes in electricity emissions factors for years 2006-2010 to conform to the Climate Registry’s Best Practice Protocols.

Steam: Change is lower emissions due to historical double-counting of auxiliary boilers.

Renewable energy: Onsite renewable energy (kW) represents a photovoltaic installation on the student union. Change represents more accurate data.

Renewable energy credits: Credits purchased from third party to offset electricity emissions.

Water and Wastewater: Changes reflect inclusion of residence halls and corrected data from the utility.

LEED™ buildings: Gross square footage for certified building projects from Judy Chess, personal communication, May 31, 2011.

Municipal solid waste (MSW): All waste sent to a landfill, excluding hazardous. All data now being reported on a fiscal year basis. Estimated data for 1990 are no longer being reported.

Diverted waste: Includes recycled, reused, and source-reduced waste, construction waste, and composting.

Recycled waste: Data for 1995 is corrected from previous reports.

Construction waste: Waste sent to a landfill/diverted from a landfill from construction and demolition sources. Waste from some construction projects may not be included. Not reported or not reported separately until 2007. This includes waste from some general campus operations.

Diversion rate: The higher number is the percentage of all MSW that was diverted from a landfill; the lower number excludes construction waste. Previous reports included diversion rates for academic years.

Hazardous waste: Variations in hazardous waste due to construction projects. Source: Multiple EH&S Hazardous Waste Source Reduction and Management Reviews. 2010 data is not yet available.

Fuel usage: Includes gasoline for commutes; includes gasoline, diesel, E85, and biodiesel for fleet.

Vehicle miles traveled – fleet: Includes all fleet and shuttle vehicles.

Drive-alone rates: Determined through campus surveys every three years.

Green fleet: Includes categories of vehicles as defined in the Energy Policy Act (various) plus hybrid vehicles. Source: Fleet Services.

Total Sustainable Food: Data for 2008 are from Cal Dining only, using the Real Food Challenge criteria. Data for 2009 are from Cal Dining only; 2010 data from Cal Dining and two additional campus foodservice vendors. For 2009 and 2010: first number includes purchases that are locally grown, organic, fair trade, or humane. Second number also includes purchases produced by locally-owned businesses.

Population: Includes students, faculty, and staff. Faculty and staff are in full-time equivalent (FTE).

Gross Square footage: Number for 1990 is assumed to be the same as for 1991. Data represents Basic Gross Area for UC Berkeley-owned space. Source: 1990-2009: FASDI, <http://fasdi.berkeley.edu>; 2010: FacilitiesLink, <https://berkeley.digicality.com>

Research: Research dollar expenditures, in constant 2009 dollars (converted using CPI). Data are fiscal year; 2009 data updated since last report; 2010 data are preliminary. Source: Controller’s Office, Schedule 1-B

Campus Grants

2010-2011 TGIF Grantees

[\(Link to TGIF Grant Award Descriptions\)](#)

Air Handling Unit Transmitters: Install differential pressure transmitters on air handling units in eight buildings on campus to limit the replacement of filters that still have lifecycle remaining

ASUC Green Certification: Program to encourage student groups to make specific changes in alignment with a checklist, achieving green certified status

Bring Your Own Mug (BYOM): Campaign to reduce purchase of single-use coffee cups

Campus Bicycle Initiative: Educational campaign aimed at increasing bicycling as a mode of transportation, through safety training and the expansion of services offered by BicyCal

Compost Alliance – Bringing Compost to Campus Buildings: Design and implement a composting system in campus buildings

Custodial Communications: Promote communication between custodial staff and building inhabitants to promote sustainability efforts and improve the morale of both

Fight the Flow: Install low-flow shower valves and educational signs in Unit 3

Greeks Energy Competition: Hold an energy competition

Installation of Hydration Stations: Install 4-5 hydration stations in locations such as Evans, Stanley, Boalt and University Hall

Low Water Irrigation: Install electronic metering and a weather station for better water management in campus irrigation systems

Mercury Vapor Detection Equipment: Purchase a system for detecting mercury during EH&S clean-ups and in lab demolition, train staff to use the new technology

Strawberry Creek Restoration Demonstration: Continue habitat restoration efforts for Strawberry Creek

Sustainability Map Project: Create an interactive web-based campus sustainability map

Talking Louder About Sustainability, Next Generation: Fund communications internships and next generation specialists for the next 2 years

Waste Reduction in the Greek Community: Reduce the volume of solid waste from the Cal Greek community through composting, recycling and the ReUse program

2011 Green Fund Grant Recipients

[\(Link to CACS Grant Award Descriptions\)](#)

“Water Doesn’t Grow on Trees:” Updating sprinkler heads in the Botanical Gardens to reduce water use for irrigation and decrease runoff into Strawberry Creek

“Follow the Leader: A Greener Durant Hall:” Provide a full-range of composting and glass and plastic recycling

“My Little Green Primers:” Provide information on how to reduce waste, conserve water and purchase green to every incoming student in campus housing

“Boosting Composting:” Audit waste streams, expand composting to more buildings and increase waste reduction awareness

“Recycling Can-Do:” Place recycling bins in student rooms

Statement of Commitment

UNIVERSITY OF CALIFORNIA, BERKELEY Statement of our Commitment to the Environment

University of California, Berkeley students, faculty, and staff are committed to taking a leadership role as responsible stewards of the physical environment and to using educational and research activities to promote environmental awareness, global thinking, and local action. This commitment includes:

- Protecting and enhancing the campus environment;
- Purchasing environmentally preferable products, minimizing the use of toxic substances, and handling wastes responsibly;
- Conserving natural resources through their sustainable use in building projects, transportation, and campus operations;
- Significantly reducing campus greenhouse gas emissions;
- Conducting innovative research on sustainable technology and practices;
- Increasing awareness of these values through instruction and example; and
- Collaborating with a diverse and engaged campus community on these issues to help fulfill the University's mission.

We are making this commitment because:

- UC Berkeley is a world leader in education and research, and must also be a leader in environmental stewardship;
- Realizing these values will create a healthier educational and work environment;
- Resource conservation helps save valuable resources for future generations and lowers operating expenses; and
- Our commitment serves as the foundation of a system to assess, prioritize, and implement campus environmental programs and sustainability initiatives.

By embracing these values and integrating them into all University activities, we can better fulfill the University's mission of teaching, research, and public service.

November 29, 2007

About This Report

The goal of the *2011 Campus Sustainability Report* is to provide a transparent accounting of Berkeley's progress in the past year toward reducing its environmental impacts. The Report is integral to understanding the current state of sustainability at UC Berkeley and can be used to inform policies and initiatives related to sustainability. UC Berkeley has published [four previous assessments of our progress](#), so this Report assumes general knowledge about sustainability and sustainability on campus. To find out more about current sustainability efforts on campus, visit sustainability.berkeley.edu, email the Office of Sustainability at sustainability@berkeley.edu or sign up for the [Bright Green News](#).

About the Office of Sustainability

The UC Berkeley [Office of Sustainability](#) develops, coordinates, and supports campus sustainability goals and initiatives with a focus on climate action. Our goals include fostering a culture of sustainability and helping the campus reach climate neutrality. We strive for excellence in breadth and depth, by implementing [bright green](#) programs to reduce our ecological footprint, raising awareness through our Talking Louder campaign, and emphasizing transparency and accountability through our plans and reports.

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