

A man with a backpack is captured in mid-air, jumping over a stone wall. Below the wall is a small waterfall. The background is filled with lush green trees. A network of white lines with orange dots at the intersections is overlaid on the image, connecting various points across the scene.

Campus Sustainability Report

Berkeley
UNIVERSITY OF CALIFORNIA

December 2013

What does sustainability mean at UCB?



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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

About UC Berkeley

The University of California was chartered in 1868, and its flagship campus was established at Berkeley. Today the world's premier public university and a wellspring of innovation, UC Berkeley occupies a 1,232 acre campus with a 178 acre central core. Net revenues in FY 11-12 were \$2.3 billion,¹ while total research expenditures were \$543 million. Over 10,000 students graduate each year. The campus formalized its sustainability policy in 2007 by adopting the Statement of Our Commitment to the Environment.

¹ http://controller.berkeley.edu/sites/default/files/2011-12_Financial.pdf

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Acknowledgements

UC Berkeley's 2013 Campus Sustainability Report was prepared 'in accordance' with the Global Reporting Initiative (GRI) Guidelines (Core). The required GRI Content Index is available [online](#).



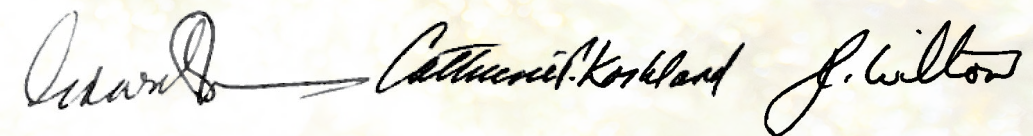
Globally, we face significant environmental, economic, and social challenges, from inequality to climate change, from food security to water shortages. Today, more than ever, we need to act and to help create a world that supports generations to come.

Berkeley works to find solutions to these pressing issues and to make the world a better place. We ask difficult questions and find answers to them. By setting ambitious goals and working to accelerate the achievement of these goals, we strive to cultivate a dynamic, energized community of sustainability and to integrate cutting edge sustainability practices into our operations.

In his inaugural address, Chancellor Dirks noted Berkeley's "strong commitment to change the world for the better."² In this *2013 Campus Sustainability Report*, we communicate some of the ways Berkeley delivers on this commitment. The Report now includes data on economic and social issues, including the influence of the university on our students and surrounding community. It highlights the public benefits from our research — like the development of an electrical precipitation device that reduces smokestack emissions and the creation of the more efficient wood-burning Berkeley-Darfur stove. Our public service mission can be seen in the 290,000 hours of annual service by our students as volunteers, and through jobs, internships, and courses.

Our commitment is also visible from the work we have done to reach our goals — most notably reducing our greenhouse gas emissions to 1990 levels two years early. We focused on what was achievable to reduce our climate impacts, in financial terms, in technical terms, and what works in this academic setting. We selected energy efficiency projects that provided the best investment in our campus community and have gotten better and more comfortable buildings as an added benefit. We have also chosen to create new programs — like the Operational Excellence Energy Management initiative — when an innovation was needed to achieve our goals. Likewise, we invested in student housing and alternative transportation programs to reduce the campus fuel use. Importantly, we relied on our community to make needed changes, even when that change required new technology, processes, or habits.

We want to thank all who have contributed to the successes over the years – the staff, students, faculty, alumni, and others who value sustainability. Your work to make this campus a better place also helps “to change the world for the better.”



Edward Denton
Vice Chancellor
Facilities Services

Catherine Koshland
Vice Provost
Teaching, Learning, Academic
Planning and Facilities

John Wilton
Vice Chancellor
Administration and Finance

2. <https://newscenter.berkeley.edu/wp-content/uploads/2013/11/DirksInauguralAddress.pdf>

Overall Performance

Each year, Berkeley tallies our progress toward our Campus Sustainability Goals³, and we have seen significant success this year, especially on greenhouse gas reductions. We have met many of our goals and are on track to achieve others. We have also added two new areas, Economic and Social Sustainability, as part of the process to prepare the report ‘in accordance’ with the Global Reporting Initiative (GRI) Guidelines (Core).

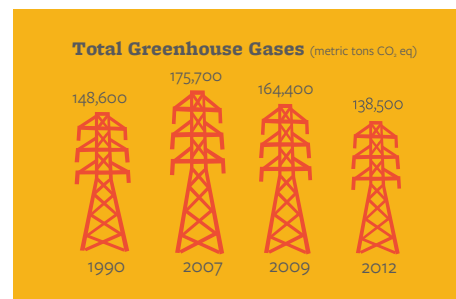
But this report isn’t just about numbers. Its intent is also to share some of the interesting stories of the daily work to improve our campus operations, to engage our students and staff, and to accelerate our progress. A report of our overall performance is more complete when including the below highlights and other features included in the Report.

Energy & Climate

Berkeley meets greenhouse gas emissions reduction target

GOAL: By 2014, reduce greenhouse gas emissions to 1990 levels. Achieve climate neutrality as soon as possible. **On Track**

Six years ago the campus set out to reduce its carbon footprint by one-third – to bring Berkeley’s greenhouse gas emissions from campus operations back to the levels they were in 1990. Our most recent emissions inventory reveals that Berkeley has met this target, two years ahead of schedule. Details of the neutrality goal and a next interim target are under consideration.



The Strategic Energy Plan (SEP) completed multiple projects, including three different ones in VLSB this past year, which reduced electricity use by 2.5 million kWh – or 10% of the total reductions achieved across campus in the last seven years. How did they do it? Tuning up the building, retrofiting lighting, reducing air exchange rates, and cleaning coils – seemingly complex

tasks that are the bread and butter of the SEP.

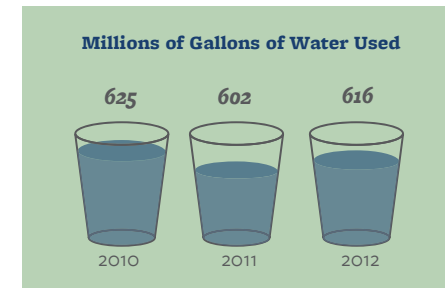
Since the launch of Energy Management initiative (EMI) in 2012, the project has achieved savings of \$2.0 million – surpassing our planning estimates – and have done so while remaining 12% under budget. Hundreds of students, faculty and staff have been involved in EMI program efforts and the program has been presented at 16 state, national, or international higher education conferences.

3. The Campus Sustainability Goals and many of the key strategies for meeting them are outlined in the [2009 Campus Sustainability Plan](#) (July 2009); the campus recently updated the purchasing and the water reduction goals.

Water

Reductions in use led by one-third drop in residence halls

GOAL: Reduce potable water use to 10% below 2008 levels by 2020. **On Track**



Water use in residence halls, adjusted for the number of residents, has declined by over 35% in the last ten years. While new halls have been built to address affordability

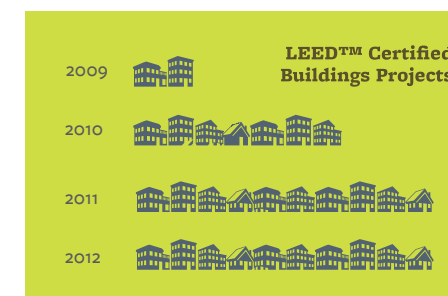
concerns, efforts to install more water-efficient technologies and to encourage residents to use less water have also contributed to this dramatic and unexpected decline.

Total potable water use increased by 2.4% in 2012, but is still down 6.0% since 2008. Water use per capita has dropped by 34% since 1995.

Built Environment

New Energy Policy creates leadership for renovation projects

GOAL: 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. **On Track**



The campus currently has ten (10) LEED™ certified building projects, representing almost 7% of total square footage. In addition, all major projects currently

in the planning, design, or construction phases, are expected to be certified.

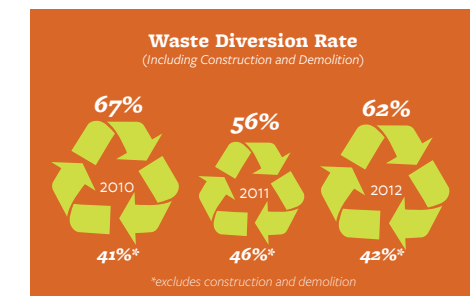
Energy Policy outlines conservation schedules and guidelines for heating, cooling, and ventilation; lighting; equipment, including computers; and construction and renovation projects. The Policy also establishes an aspirational “No Net Increase” energy goal to direct energy performance goals for renovation projects.

The renovation of 37 general-assignment classrooms in 10 buildings — Barker, Barrows, Evans, Hildebrand, Latimer, LeConte, Tan and Wurster halls and Donner Lab and Genetics and Plant Biology — targeted improvements in functionality, aesthetics and comfort, as well as sustainable features such as repurposed furniture and low/no VOC paints.

Waste

Partnerships are key to action and progress

GOAL: Achieve a 75% diversion rate by June 2012 and zero waste by 2020. **Making Progress**



The total diversion rate for campus rose to 62%, while the diversion rate when construction waste is excluded dropped to 42%. The amount of solid waste sent to landfills by the

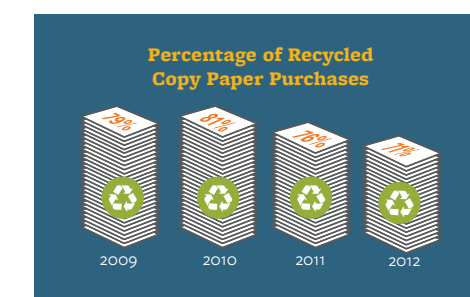
campus went down by 4% last year, and has dropped by 28% since 1995.

Staff and environmental design students teamed up to design a trash can that excelled in all categories: waterproof, vermin-resistant, safer, and durable. With the first installation of the new bins, our campus moved another step forward in achieving zero waste by 2020.

Procurement

Purchases and reporting continue to improve

GOAL: Comply with the University of California environmentally-preferable purchasing policies and procedures. **Making Progress**



The campus purchased at least \$14.4 million of environmentally-preferable products last year. The increase – 60% in three years – is due to multiple factors, including better

reporting from some vendors, the inclusion of more vendors who now flag green products, and also increased purchases due to staff efforts and engagement.

The campus also monitors the percentage of spend on environmentally-preferable products by product category, which range from 38% for office supplies to 100% for computers.

Food

Innovation leads to new to-go containers and improved purchasing

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



After a successful pilot in Foothill Dining Commons last semester, Cal Dining has expanded Chews to Re-use, their reusable to-go container program, to all dining halls and to

include reusable silverware and cups.

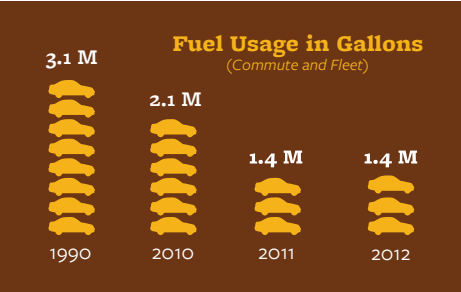
Campus vendors have increased sustainable food purchases by four percentage points to 28%.

Transportation

Fewer vehicles, fewer miles, less fuel

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

Fuel use from fleet and commute is below 1990 levels by over 50%. In addition, the percentage of green vehicles in the fleet has risen to almost 23%, almost to the goal of having 25% by 2014.



Parking & Transportation has installed two Bicycle Fix-It stations that are free and available for the entire campus community.

Land Use

Sustainable planning helps achieve broader goals

GOAL: Plan every new project to serve as a model of resource conservation and environmental stewardship. On Track

The campus is currently constructing the Lower Sproul Student Community Center, and undertaking a major planning effort for the Richmond Bay Campus. Sites all around the San Francisco Bay suffer from a history of manufacturing-related pollution, and the University’s work in Richmond will address legacy site contaminants while bringing major new development to Richmond. The Richmond Bay Campus plan sets aside 25 acres for preservation of natural open spaces, including native coastal terrace prairie grasslands and marshlands.

The Strawberry Creek Restoration Program has begun to shift its focus from invasive species removal to a more comprehensive restoration approach that includes native planting. Removing invasive species without effectively establishing other desired (native) species can leave a “weed-shaped hole” that invasive species can easily recolonize. Ideally, native planting fills this “hole” with a community that supports a higher level of biodiversity.

200 redwood trees and 100 toyons were planted by 100 volunteering campus and community members. The trees were donated by the College of Natural Resources, potted by the Fire Mitigation Committee, and then grown in a lath house through the voluntarily efforts of the College of Engineering, the Lawrence Hall of Science, and Recreation Sports staff.

Across Campus

New Green Departments support community of sustainability

The Haas School of Business is one of two newly certified green departments and is the third academic partner and the first department to have students as members of their Green Team. Procurement Services is the second green department in leased space, and they are the first department to get credit for using only reused furniture. A third department, Environment, Health, and Safety, re-certified this year for the second time with a record-tying 22 points.

Campus groups, projects, and individuals have won numerous awards – ranging from a Schmidt-MacArthur Fellowship to Recyclemania to Best Overall Design for the Maximino Martinez Commons.

There have been 130 certified green events, with almost 39,000 attendees; over 35% were student-run events, with 75% offering composting and 61% offering sustainable food.

Academics and Learning by Doing

Documenting sustainability courses and research

In 2012-13, 26% of undergraduates took at least one course focused on sustainability. The campus offers over 500 sustainability courses, of which 240 are directly focused on the subject. There are at least 200 faculty engaged in sustainability research in almost half of the departments on campus.

Economic Sustainability

Foundational role in building California

38% of Berkeley undergraduates received a Pell Grant (compared to 17% for the Ivy League as a whole) and 25% are first generation college student with neither parent having a four-year college degree.

As of June 2012, Berkeley owned 2,493 total active inventions and 641 active U.S. patents.

Over 3,500 UC Berkeley graduates have enlisted in the Peace Corps, more than any other university.

Social Sustainability

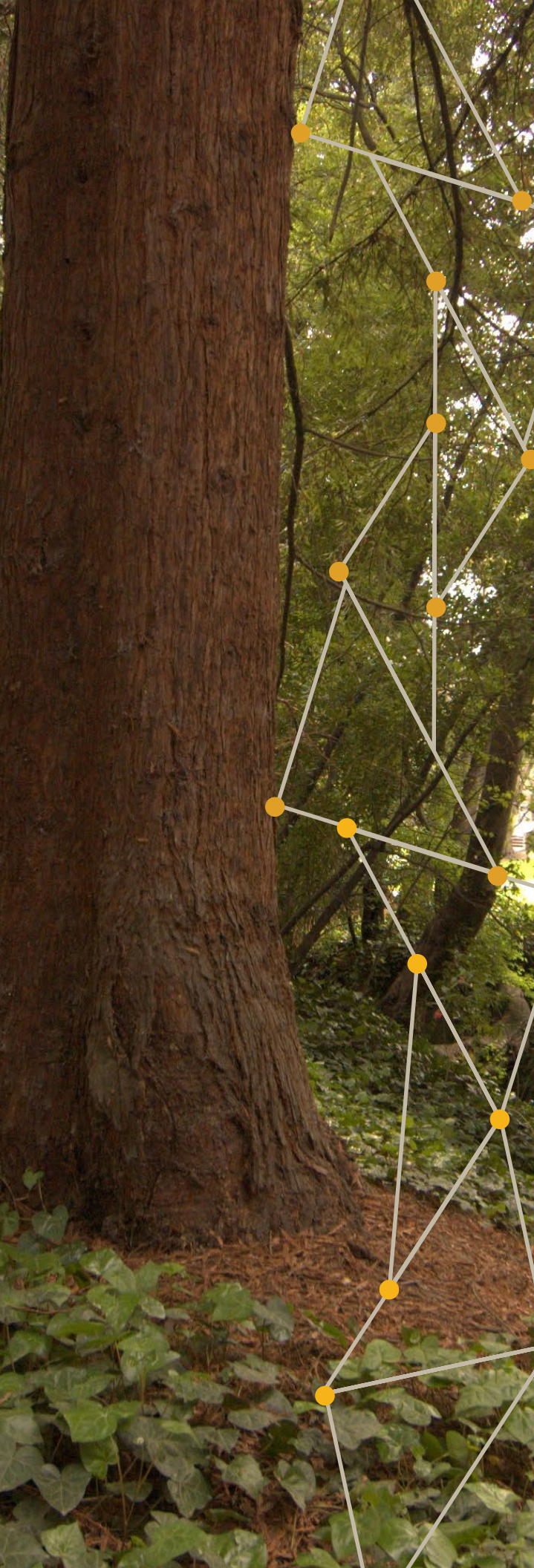
Staff and students matter

University Health Services (UHS) provides programs such as Health*Matters wellness program, with a vision of “a healthy campus community that is an inspiring place to learn, work and live.”

The new Berkeley Catalysts program offers a unique professional development opportunity for promising campus staff from units across campus. Catalysts will attend nine learning labs aimed at honing their leadership and organizational improvement skills in service of excellence in administration and operations, followed by three months of coaching and implementation.

The campus maintains a diversity website which compiles information on the work of the Vice Chancellor for Equity and Inclusion, the Campus Climate Survey, the Berkeley Principles of Community, and other related efforts, including academic initiatives and related resources.

87% of students agree (somewhat agree, agree, or strongly agree) with the statement “Knowing what I know now, I would still choose to enroll at this campus.”



Spotlight on Students

Our students are our principal agents of change, and the extent to which student involvement plays a role in advancing sustainability on campus is evident in many ways. There are over 35 environmental student groups and service learning programs like Building Sustainability @ Cal and Green Campus. For UC Berkeley, sustainability leadership also entails educating our students and graduating them as future leaders. The campus is committed to student involvement through service learning and programs – including student-led undergraduate and graduate courses, research focused on advancing campus climate neutrality, and promoting sustainable practices through behavior change education in campus buildings.

Winning Awards

The **Fight the Flow** program run by the **PowerSave** interns won a Best Practice Award at the California Higher Education Sustainability Conference. Their program, which collaborated with Housing staff to install 124 UZLOW shower valves in two residence halls, showed how water and energy savings are connected. When in use, the UZLOW valve reduces both water consumption and the natural gas used to heat water by decreasing hot water flow when shampooing, shaving, or soaping up.

A recent UC Berkeley graduate has won a **sustainability research award** from the Association for the Advancement of Sustainability in Higher Education (AASHE) for her senior thesis calculating the campus' greenhouse gas emissions based on its entire supply chain of goods and services. **Kelley Doyle**, who received a B.S. in environmental sciences in May 2012, won the award for her thesis, "Converting university spending to greenhouse gas emissions: A supply chain carbon footprint analysis of UC Berkeley." Doyle's work provides a framework to develop a standardized supply chain greenhouse gas emission report⁴.

Antony Kim (Masters of Science in Architecture) and his mentor Professor Galen Cranz won the new **Schmidt-MacArthur Fellowship**, an international postgraduate fellowship on the circular economy for design, engineering, and business students.



Photo credit: Nik Crain

Nature Village, a multidisciplinary and multicultural group of University Village residents, students, staff, and campus groups, won a **CACS Sustainability award** for their work to promote sustainable living practices. In its inaugural year Nature Village launched three programs including the Green Family Program – with 50 families participating in pilots for energy and water saving tools like low flow shower heads and racks for air drying clothes. In the long term, Nature Village seeks to create a replicable model for institutionalizing sustainability in student family residential units. (TGIF [website](#))

Creating Change

In April, UC Berkeley became a hub for student sustainability innovation when it hosted the **Spring 2013 California Student Sustainability Convergence**. Hundreds of students across the state gathered at Berkeley to discuss the latest challenges, developments, and solutions to improving green awareness and action among students. Keynote speakers Crystal Lameman, Hunter Lovins, and Garth Lenz shared their insights on a diverse range of topics, from environmental consulting to eco-photojournalism. Along with intensive panel discussions and workshops, students also enjoyed dinner on Memorial Glade followed by a nighttime music concert.

The **Berkeley Student Food Collective** (BSFC) launched a **Community Supported Agriculture** (CSA) program, the Box, which allows subscribers an easy way to pick up an assortment of seasonal organic/local produce each week at the store. Operations manager Gwen Von Klan explains that the cost, convenience, and multiple farming sources make it an ideal program. "Our produce box is more suitable for students, because it is smaller and cheaper (only \$15!). We are able to stock a wider variety of options, because we source from multiple local, organic farms, rather than only one farm as traditional CSA boxes do."

Working Together

In partnership with The Green Initiative Fund, PowerSave Campus and Greening the Greeks published a [how-to guide for energy savings competitions](#) that will help other student groups create and run competition in a college or university Green system.

In 2012, the **Student Environmental Resource Center** ([SERC](#)) was founded to serve as a hub for students to get involved in projects, events, organizations, and advocacy groups to improve our local environment. Its new location on the third floor of Mulford Hall is a good fit, given the proximity to the College of Natural Resources. (TGIF [website](#))

Sustainability Associates from the Office of Sustainability produced a [Student Sustainability Montage Video](#) that **features green clubs and organizations in action** during the 2011-2012 school year. With a soundtrack of soulful tunes, various humorous and memorable pictures illustrate the amazing events run by student and other campus groups that are expanding sustainability here and abroad. These organizations are making outstanding efforts to strengthen and build a campus community that shares the same mission of lessening their impact on the environment.



4. Carol Ness, NewsCenter, "[Sustainability award for senior thesis on campus emissions](#)," October 22, 2012.



Introduction

“We tackle difficult problems and find solutions”

In my position on campus, I regularly see the dedication and passion our students have for making the campus and the world a better place. It is visible in the courses they take and in the work that they do. One recent example was the creativity that I heard at a recent forum of student sustainability groups gathered to talk about their work and goals for the coming academic year. Another was earlier this year when a student, Joe Quattrocchi, used his spring break to work on this Report.

Joe and a team of four other students helped the Office of Sustainability to improve this report as part of their involvement with Net Impact – a group that use the power of business to create a more sustainable world. I wanted this report to align with the Global Reporting Initiative (GRI) guidelines and enlisted their help, since the team shared the campus commitment to providing more and better information to our stakeholders. How committed were the students? Joe had reached out to GRI staff to clarify a few questions and ended up taking a two-day training course to hone his skills.

With their help – and that of many others on campus – this year’s report contains new features. There are data on campus impacts on economic systems and conditions of our stakeholders and our surrounding communities. There are new indicators of social sustainability influences like diversity and employment. We have also added detailed segments on certain topics – Spotlights – including one that further illuminates the contributions of students.

Priorities

The campus work on sustainability is collective, depending on individual, group, and department efforts, which each bring different priorities to this endeavor. The 2005 Campus Sustainability Assessment was the campus’ first effort at defining and measuring the cumulative impacts from these actions, but it was also a “a necessary balancing act between breadth and depth,⁵” in terms of completeness. As described later in the Spotlight on Reporting, this document continues that work and shares material and relevant information and data, again based on current impacts, importance to stakeholders, and avoiding potential future risks.

But reporting is not priority-setting. In an attempt to provide additional guidance to stakeholders on the key priorities, major campus goals were documented in the 2009 Campus Sustainability Plan. Since that time, we have set strategies, completed projects, and made progress in every major area. Significant staff and student time and/or funding have been devoted, especially to reduce energy and greenhouse gas emissions and to increase the diversion of waste. At the same time, a wide range of sustainability courses have been taught, new degree programs have been added, and faculty have

added to the body of research on key issues. However, efforts to be transparent on priorities need to include more precise details on funding levels, information that is complex but which will be compiled and reported in next year’s Report.

How to Read This Report

The Report provides a summary of UC Berkeley’s progress toward its sustainability goals. It contains data, graphs, pictures, and stories – all compiled to share our work in the past year and help readers understand the relevance and context for this work.

One difficulty in achieving clarity in the Report is that the different data sources function on different timelines. The focus of the Report are activities done in calendar year 2012, but some data are already reported by academic or fiscal year, and cannot be easily translated. A further complication is that not all fiscal year 2012-2013 data have been compiled and published in time for inclusion in this Report. We have tried to be as clear as possible about the timeframe for each data point.

Every year, our Reports have tended to increase in length and detail. As we have compiled information over time, we have been able to add more years of data and more context to our actions. This has been especially true for the environmental sustainability section, where the Report is one of our main reporting tools. The new sections on economic and social responsibility report data that are usually well-covered in other university venues, meaning these sections are currently shorter. This is expected to change over time.

Stakeholder Engagement

Stakeholder engagement on previous Campus Sustainability Reports has been extensive but informal. The Office of Sustainability regularly meets with stakeholders, but has not had a strategy for ensuring that the engagement around our sustainability reporting has been comprehensive. The Office has done numerous presentations to faculty, staff, student, and community groups on elements of past Sustainability Reports and conducted some recent stakeholder interviews. The Office also collaborates with other institutions of higher education and benchmarks our progress against recognized best practices.

Moving forward, the engagement process will include more discrete engagement activities, likely using social media, and will also work to include additional stakeholders like alumni and suppliers in a more visible way. The engagement will be documented in future reports.

Changes Over Time

The campus has set environmental sustainability goals in several areas, and most of them are measured against a 1990 baseline. While it is easy to report our progress towards these goals, it is

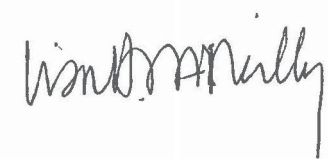
also useful to share other changes on campus in the intervening years that might have impacted this progress.

One noteworthy change has been the construction of new residence halls. The 50% increase in the number of residents located near campus was undertaken in part to address affordability issues, but also helped change student commute patterns and reduce by half the number of students driving to campus.

Another transportation-related change was the decision to reduce the number of parking spaces on central campus, moving them to the periphery of campus. This reduction freed up building sites for new construction (including of residence halls) and also “for preservation as open space or for circulation improvements.”⁶ As a result of this and other factors, faculty and staff commute patterns also changed, so that 25% fewer drive to campus.

Even more important have been the ‘electrification’ of offices and labs. In 1990, the number of computers on campus had already begun to increase. UC Berkeley received a large grant from IBM (the Distributed Academic Computing Environment) in the late-80s, which improved a number of departmental facilities. It is estimated that we currently have 95,000 computing devices on campus, almost half of which connect through our wireless networks. Combined with the increase in electronic equipment in classrooms and labs, the impact of these devices on campus energy use has been great – total electricity use has grown by almost 40%, faster than we have built new buildings.

But this is part of what makes the Berkeley sustainability story so interesting – that we tackle difficult problems and find solutions. While electricity use was driven up, we have tackled our total energy use and now find that we use less energy per square foot than we did in 1990. The more things change, the more they stay the same.



Lisa McNeilly
Director of Sustainability

12 5. [2005 Campus Sustainability Assessment](#), April 2005, page 6.

6. 1990-2005 Long Range Development Plan, Executive Summary,
http://www.cp.berkeley.edu/LRDP/UCB-Segmented_pdfs/Executive_summary.pdf



*“Though there’s always
room for improvement,
sustainability is now our
normal way of doing business.”*

Judy Chess, Staff

Spotlight on Reporting

UC Berkeley has published [six previous](#) Campus Sustainability Reports, each more comprehensive than the one before it and each with a goal of being accountable for the progress made toward our sustainability and environmental goals. In 2013, the Office of Sustainability partnered with a student team from Net Impact Berkeley, who provided recommendations and content aimed at improving campus sustainability reporting and achieving compliance with the reporting guidelines published by the Global Reporting Initiative.

Why the Global Reporting Initiative (GRI) standard?

Rather than solely reporting on environmental data, UC Berkeley feels that its stakeholders deserve transparent accounts of our economic, social, and environmental performance indicators. Through the integrative reporting of the GRI standards, we are able to hold ourselves more accountable and publicize our commitment to reducing and improving our impacts. By driving transparent accounting of our operations, GRI – and specifically the new G4 standard – is the medium chosen by UC Berkeley for reporting on sustainability.

Which GRI indicators were the most material and relevant to our university? The Net Impact team worked with the Office on the process to assess which economic and social reporting aspects were most material to our organization. The process had already been completed for environmental performance, in the 2005 Campus Sustainability Assessment, with some adjustments made since then based on stakeholder feedback.

As a public institution with a goal of providing a world-renowned education to our students, many of the GRI indicators were not relevant to our work. We identified and prioritized those that

were material based on several criteria. We considered how well the indicator reflected our economic or social impacts and how important they might be to our stakeholders. Since we had not previously included any economic or social data in this report, we also focused on what is already publicly reported in other venues as an important criteria of materiality.

At times, we did not have a way to cost-effectively access information on a relevant indicator and will work to compile them in the future. We recognize the challenges that are associated with moving the campus towards becoming GRI compliant, and are working to retrieve data that will make the report more comprehensive in its scope. Any omissions are noted in the GRI Content Index at the end.

What is Net Impact? Net Impact is an international nonprofit organization with the mission to inspire, educate and equip individuals in using business to tackle the world’s toughest social and environmental problems. The Net Impact Berkeley (NIB) undergraduate chapter works with organizations ranging from nonprofits, social enterprises, for-profits, student organizations and charitable organizations in order to drive positive change within the workplace and various industries. In choosing to collaborate with the Office of Sustainability, they recognized the unique opportunity they had to help set precedents to guide other universities or institutions in their efforts to become more sustainable.



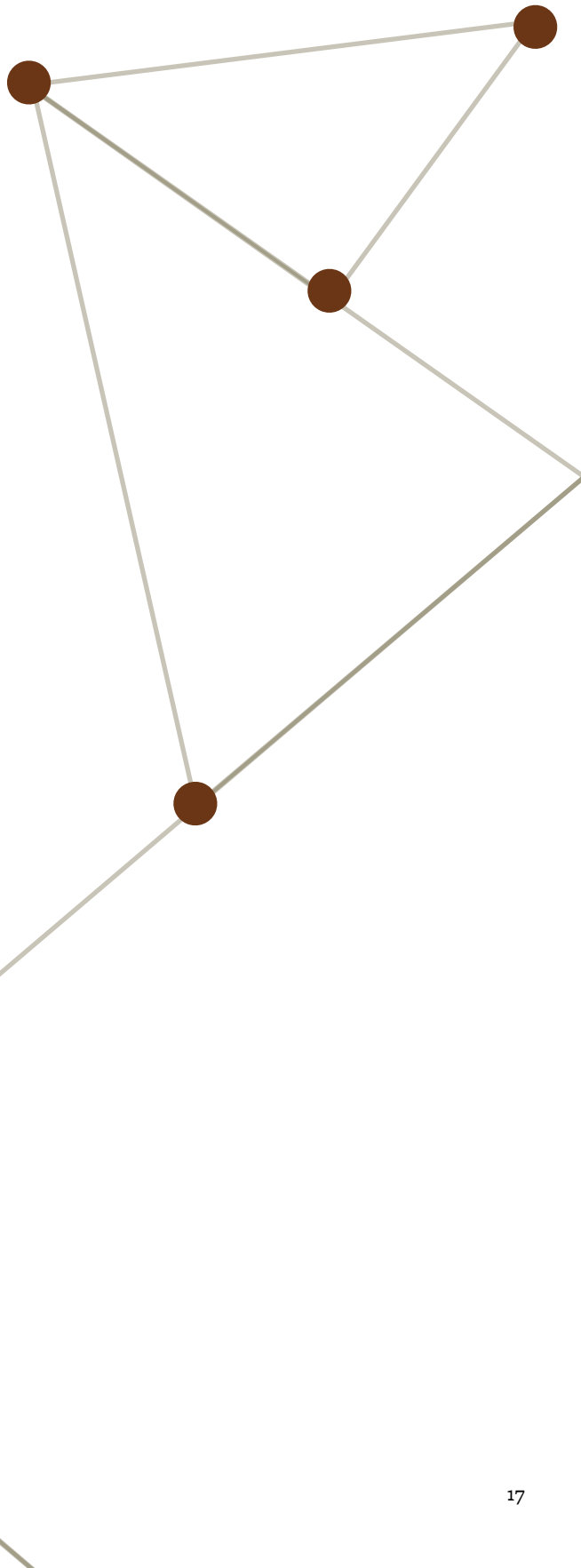


“Sustainability at Berkeley is giving the current-best answers to questions that no one has thought to ask, and by finding the right balance between people, the environment, and the economy.”

Arpad Horvath, faculty

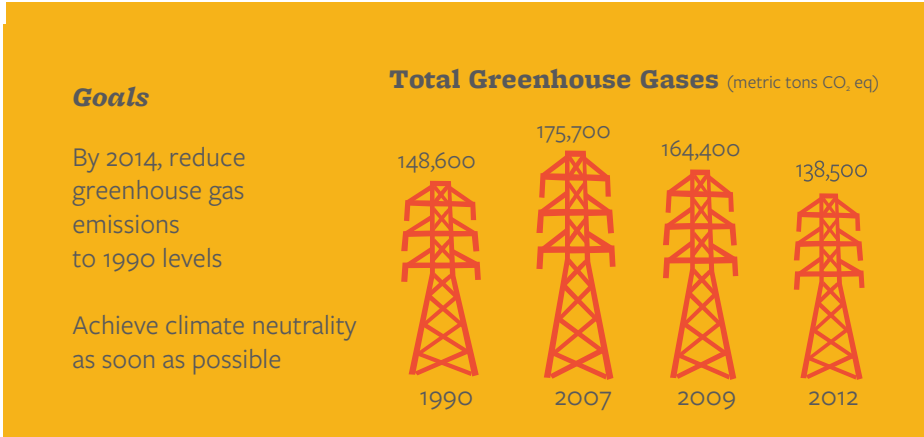
Environmental Sustainability

The Berkeley campus has achieved or is on track to achieve the majority of its environmental sustainability goals. Most notably, we have reduced our greenhouse gas emissions to 1990 levels two years ahead of schedule. We have also exceeded our fuel use and our sustainable food purchase goals. We continue to pursue other goals, and have reduced water use per capita by one-third and waste sent to landfills by 28%.



Energy & Climate

Berkeley Meets Greenhouse Gas Emissions Reduction Target



Six years ago the campus set out to reduce its carbon footprint by one-third – to bring Berkeley’s greenhouse gas emissions from campus operations back to the levels they were in 1990. Our most recent emissions inventory reveals that **Berkeley has met this target, two years ahead of schedule.**

Ambitious at the outset, this voluntary target to reduce greenhouse gas emissions (GHG) to 1990 levels by 2014 puts Berkeley ahead of UC Policy and State of California guidelines which call for this level of reduction by the year 2020.

We have reduced our emissions and met our first target by:

- Investing in energy efficiency and sustainable transportation practices.** Since 2006, the campus has saved 20 million kWh of electricity through building retrofits and reduced fuel use by more than 1 million gallons by increasing the number of bicycle, pedestrian and mass-transit commuters.
- Buying Greener Power.** The campus is using electricity that includes more solar and wind energy and less coal through purchases from Pacific Gas & Electric, a utility that is required by state law to provide power that by 2020 will include 33 percent renewable energy.
- Improving Data and Methods.** UC Berkeley has improved the accuracy of its emissions inventory profile by using the best data available about campus energy use and by staying current with the best reporting methods.

Mitigation Strategies

Annual Savings as of 2012

Energy Efficiency & Savings:

Strategic Energy Plan & Operational Excellence Energy Management Initiative

20 Million kWh

87 Thousand MMBtu Steam

Reduced Fuel Use:

Fleet & Commute

1.1 Million Gallons

This accomplishment has been guided by the Cal Climate Action Partnership (CalCAP) and its steering committee – a broad collaboration of faculty, staff, students, and leadership. On-going climate action facilitation and reporting is managed by the Office of Sustainability.

In spring 2014 CalCAP will make a recommendation to Chancellor Dirks on Berkeley’s next GHG reduction target. The new target is expected to establish a challenging, but achievable, goal for the year 2020, and put the campus on a path to climate neutrality, as well as maintaining our position as a leader in setting and implementing ambitious carbon-reduction strategies.

Tracking and Evaluating Emissions

The campus conducts a ten-source inventory that is third-party verified and reported to both The Climate Registry and the American College and University Presidents Climate Commitment.⁷ The main energy sources include utility-provided electricity; purchased steam from an on-campus, natural gas fired, co-generation plant; and natural gas used for heating and hot water in a limited number of buildings (see graph at right).

The campus analyzes emissions, energy use, and transportation scaled to campus population and square footage over time to monitor normalized progress and for comparison purposes.

- Electricity use increased by 2.1% since 2011, but use normalized for square footage dropped by almost the same amount.
- Total energy use, however, dropped by almost 2% last year, while energy use per square foot is down 6% from 1990.
- Total greenhouse gas emissions are below 1990 levels⁸, and emissions per research dollar are down over 40% since that same time.

Embedded Emissions

The campus has calculated the greenhouse gas emissions of its supply chain through a life cycle assessment using the Comprehensive Environmental Data Archive (CEDA) emission factor database. The life cycle assessment (LCA) assesses the environmental impact of the campus procurement of goods and services. This analysis provides an estimate of all indirect emissions of greenhouse gases (GHG) of products and services from cradle to grave, and is distinct from the inventory discussed above that measures reported emissions. The analysis has now been done three times, although the data are not completely comparable given differences in methodology and data sources.

| Embedded Emissions in Supply Chain (tons) | | |
|---|-------------|------------|
| 2007 | 2009 | 2012 |
| 273,000 (a) | 128,590 (b) | 86,357 (c) |

(a) “Feasibility Study 2006- 2007 Final Report,” UC Berkeley Climate Action Partnership, July 2007.

(b) “UC Berkeley’s 2009 Supply Chain Carbon Footprint from Campus Procurement and Construction,” Kelley Doyle, May 2012, Undergraduate Environmental Sciences Senior Thesis. Does not include purchased electricity LCA emissions.

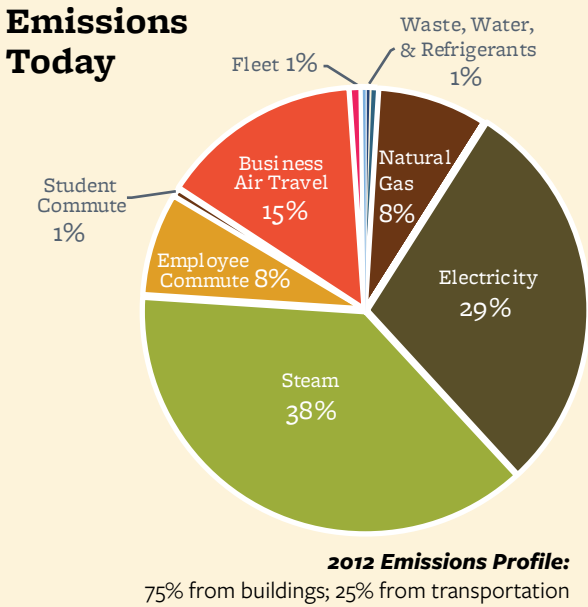
(c) “Measuring Our Carbon Footprint,” Net Impact student project, unpublished. Does not include construction or purchased electricity LCA emissions.

7. Additional information on the inventory including methodology, boundary, and reported gases can be found at <http://sustainability.berkeley.edu/calcap/>

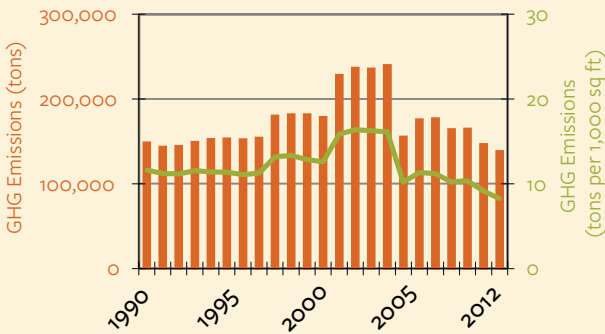
8. The increased emissions between 1998 and 2005 are due to a higher emissions factor for electricity purchased in these years from a different utility.

GHG Emissions Profile

Berkeley annually inventories and evaluates ten GHG emission sources. Emissions are reported to The Climate Registry, and inventories are third-party verified.

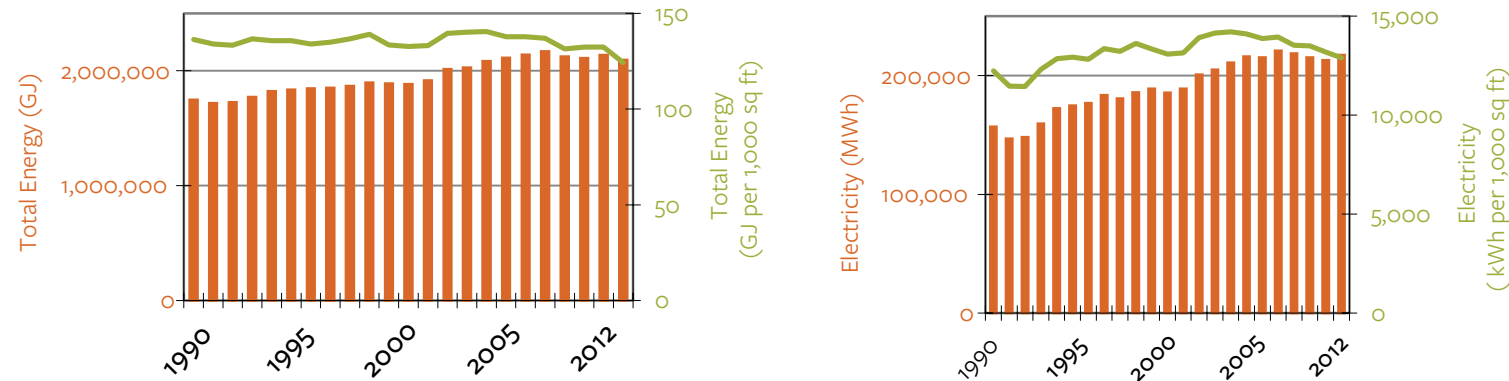


Emission Trends Since 1990



Reduction Target:

In 2012 Berkeley met its first GHG emissions target by reducing emissions to lower than 1990 levels.



CalCAP Background

Berkeley's effort to reduce the climate change impacts of campus operations is guided by the Cal Climate Action Partnership (CalCAP) and its steering committee chaired by Vice Provost Cathy Koshland. Initially conceived of by a group of concerned students in 2005, CalCAP is a collaboration of faculty, administration, staff, and students working together to accelerate partnerships with operational units responsible for emission reduction projects, encouraging related student learning and research, and critically evaluating strategies – changing course as needed to reduce climate impacts.

In 2007, CalCAP completed Berkeley's first greenhouse gas emissions (GHG) inventory and climate action feasibility study, and former Chancellor Birgeneau committed the campus to reducing its greenhouse gas emissions to 1990 levels by 2014. The 2007 Feasibility Study and the 2009 Climate Action Plan are guiding documents that identify strategies to reduce greenhouse emissions and begin the discussion on how to achieve climate neutrality – defined by UC Policy: "... the University will have a net zero impact on the Earth's climate..."

Since the first reduction goal was set six years ago, the campus has monitored greenhouse gas emissions through annual inventories; implemented mitigations strategies including aggressive energy efficiency through the Strategic Energy Plan and the Operational Excellence Energy Management Initiative; tracked the savings from these mitigations; improved data sets and reporting protocols; engaged student related research to broaden the vision of our work; and more. The campus has identified and committed to a series of climate mitigation strategies in two categories – infrastructure (mostly energy efficiency) and behavioral (encourage individuals to conserve energy and make smarter transportation choices).

Student Contributions to CalCAP

Student-led research and service learning courses along with demonstration projects are integral to CalCAP's ongoing success. Over the years graduate students have sponsored a CalCAP course that brings together students from a range of disciplines to study the projects being implemented and report on new initiatives the campus might undertake. In 2012, students taking CE 268E completed [research](#) that advances campus climate reduction initiatives as varied as assessing the life cycle of renewable energy generation and completing emissions projections to 2050 for the campus. Cutting edge research is not just the purview of graduate students – in 2012 undergraduate Kelley Doyle's senior thesis advanced campus evaluation of Berkeley's carbon footprint from the supply chain. This thesis won a national award.

Energy & Climate at a Glance

The [Climate Action Fund](#) accepts donations to the campus effort to reduce greenhouse gas emissions.

An energy management system that controls ventilation, temperature, lights, and operating hours is used in 70 buildings on the main campus.

UC Berkeley received a City of Berkeley Energy Benchmarking Award in November 2012.

The student-run [Berkeley Energy Resources Collaborative](#) (BERC) hosts an annual energy symposium.

Residence hall competitions to reduce electricity consumption and CFL exchanges are held each semester.

The [Cal Energy Corps](#) is an undergraduate internship program created to engage students in the design, development, and delivery of sustainable energy and climate solutions around the world.

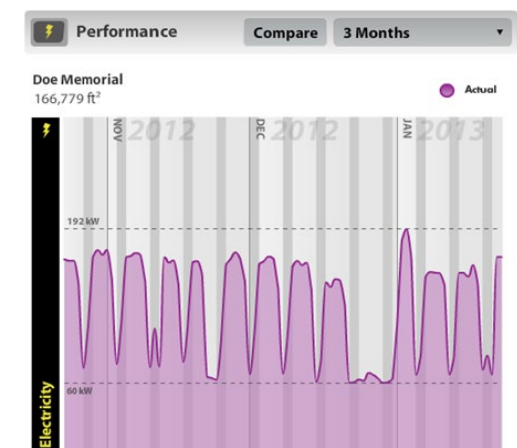
Campus Energy Efficiency Projects Have Saved Over 26 Million kWh

In the years of 2006-2013, the campus has funded over 100 projects under its [Strategic Energy Plan](#) to reduce energy usage in new and existing campus buildings, through a partnership with PG&E. These projects, which range from lighting to commissioning to heating and ventilation, are also expected to have saved close to 1 million therms of natural gas annually, resulting in annual cost savings of over \$2.5 million.

Winter Curtailment Doubles Energy Savings For almost two decades, large parts of campus have taken a long break at year's end – and taken steps to lower or shut off heating and ventilation during that break to curtail energy use. This year, the Energy Office included significantly more buildings in the program. Extended curtailment periods were enacted in Wurster Hall and Residential Student Services, and Blum Hall, Durant Hall, and Sutardja Dai Hall were added to the program, with the latter being the first modern research facility to voluntarily participate. The myPower program also expanded their outreach to include a Curtailment Checklist that made it easier for the last person in a building to prepare for the break. Due to these and other efforts, the campus used \$110,470 less energy, almost double the savings achieved during last year's curtailment.

A Clear Vision of Sustainability Although the School of Optometry is recognized as one of the top optometry schools in the country, it should also be recognized for its efforts in sustainability and energy efficiency. Out-going facility manager Linda Schmidt has been proactive in following up on Strategic Energy Plan (SEP) projects, resulting in additional energy savings. She also implemented a "no personal space heater" policy (except for the winter months in select cases). Linda's successor, Cliff Lobbergt, prompted the Energy Office to perform lighting retrofits and also established a curtailment program for Minor Hall, which reduced use by an astonishing 70% over this past winter break. In addition to the facility managers, the student organization [Green Eyes](#) promotes sustainability throughout the school by encouraging environmentally friendly policies, teaching educational seminars, and providing a composting service for the facility's clinics. Read [more](#).

How to Use Less Energy in Labs Did you know that labs comprise over 40% of the total campus energy use? Shut the Sash, an educational campaign and competition run in Tan Hall, focused on educating lab users about how shutting the sash of a fume hood can save both energy and money. PowerSave Green Campus worked with the Lawrence Berkeley National Laboratory's Paul Mathew and the Western Cooling Efficiency Center to produce effective energy savings through an education campaign and a competition incentive. The UC Berkeley team put up flyers, conducted surveys, and sent out emails to encourage behavior change. They analyzed the fume hood sash openings to evaluate how much energy was being wasted in the labs, but found that the majority of the fume hoods in Tan Hall were open only if they were in use.



At Doe Memorial Library the dashboard shows curtailment in action, with electricity use almost flat over the break.



Spotlight on Energy Management

In April 2012, UC Berkeley's Energy Management initiative (EMI) was launched to provide a new framework for efficiency measures and to permanently reduce the amount of energy the campus uses. In the first year of the program, we have built momentum towards establishing energy efficiency as a social norm and part of the day-to-day operations of the university. Since the launch of EMI in April 2012, **the project has achieved savings of almost \$2.0 million** – surpassing our planning estimates – and have done so while remaining 12% under budget. Hundreds of students, faculty and staff have been involved in EMI program efforts and the program has been presented at 16 state, national, or international higher education conferences.

Over the last two years, the **Energy Office** has built a team that executes energy projects and that serves as a catalyst and “one-stop-shop” for energy use reductions on campus. By managing the Energy Incentive Program and working with stakeholders, the Office is helping to transform the way the campus uses energy. Applying a blended approach of engineering, analysis, and technical skills, the Office works across traditional organizational silos to achieve its goals.

The **Energy Incentive Program** (EIP) is successfully established and is achieving electricity savings. This innovative approach to energy management gives Operating Units (OUs) a financial incentive to implement energy-saving measures. OUs that use less electricity than allocated will receive an incentive payment, while those that exceed the allocation will incur overage charges beginning in the second year of the program. OUs receive monthly meter reports indicating actual consumption relative to their baseline allocation and will soon receive end-of-year statements and incentive payments totaling \$870,000.

The software that shows **real-time energy use** for campus buildings has already been installed for over 100 buildings. Ultimately the campus will have over 140 live dashboards by the completion of the third phase of meter installation, which should help visualize the cumulative impact of individual savings. The benefits of this system go beyond the public dashboards. Analytics provide real-time feedback on building-level interval data, which helps with identification of anomalies and addressing large system malfunctions. Responding to reports from building occupants on variances in electricity use seen on the dashboards yielded savings of \$45,000 (Barrows Hall), \$2,000 (Evans Hall), and \$25,000 (Tolman Hall).

Individual behavior is another key component of the efforts to reduce energy use. The **myPower outreach campaign** includes specific energy-saving actions that individual faculty, staff, and students can take. The student Energy Associates have conducted twenty-five energy surveys in various campus buildings. Outreach in Unit 1 (where 1,110 stickers and over 200 posters were placed over winter break) resulted in approximately 8% savings in both February and March, and a 4-6% reduction in use in April, or almost 40,000 kWh. In addition, the myPower Resource Center provides the essential interaction between project staff and campus stakeholders on ways to save energy.

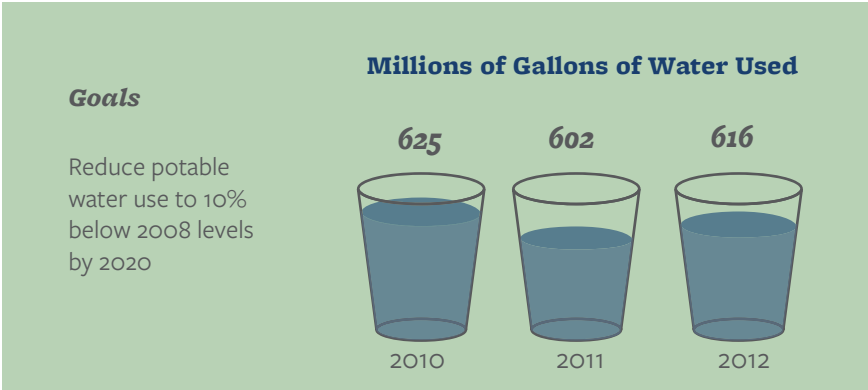


“The university focuses on addressing problems of enormous consequence to society that make a difference in the future of the world.”

Anonymous, Impressions of Berkeley

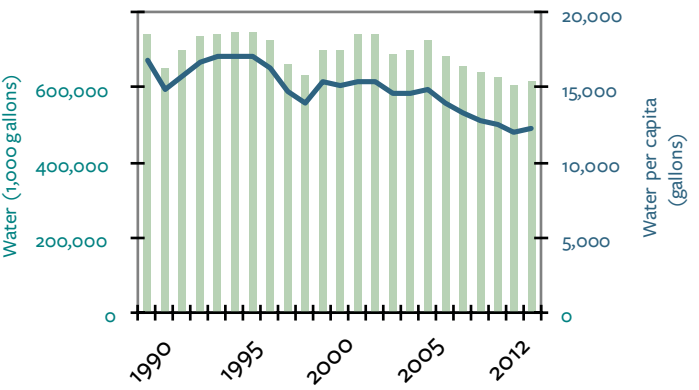
Water

Reductions in use led by one-third drop in residence halls



Water is an increasingly scarce resource in California, due to population growth and drought. In past years, the East Bay Municipal Utility District (EBMUD) has declared droughts and implemented drought management plans that seek to reduce regional water use. Water conservation is even more important when the energy associated with transportation and treatment of water is analyzed.

A concerted water conservation effort by the campus is environmentally beneficial, improves aging fixtures and equipment, reduces campus risks associated with rationing measures during drought years, and hedges annual water price escalation. Concerns about water conservation and the possibility of future water rationing or price increases prompted the Chancellor’s Advisory Committee on Sustainability (CACS) to commission a water usage and conservation report in 2009 (included as Appendix A). The recommendations in the report led the Chancellor to set a goal to reduce potable water use to 10% below 2008 levels by 2020. The campus will continue to monitor whether the local utility can provide non-potable water for irrigation and consider doubling the water use reduction target if it does.

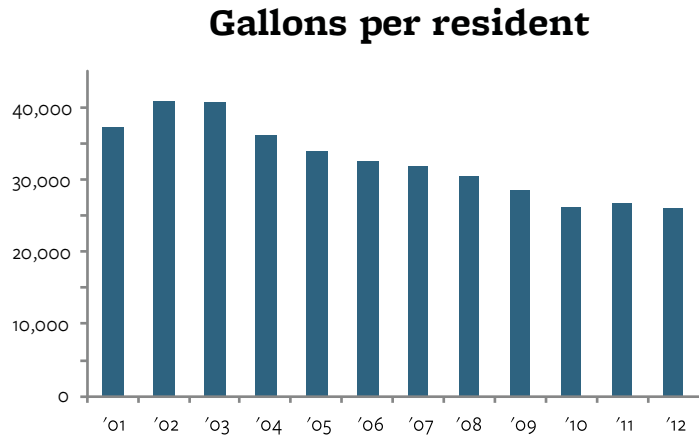


9. Adjustments for population growth will be by “Weighted Campus User,” which is defined as (1 × number of on-campus residents) + (0.75 × number of non-residential or commuter full-time students, faculty, and staff members) + (0.5 × number of non-residential or commuter part-time students, faculty, and staff members). 10. UC Berkeley baseline: Average over FY 2003-2005, or 18,851 gallons 11. Approximately 24,000 gallons of rainwater are reused each year for irrigation at the Boalt Law School.

In the current year, there are two areas of focus for water conservation projects. First, the Capital Renewal Committee will identify leaking heat exchangers that could be repaired or replaced that could yield both energy and water savings. Second, The Green Initiative Fund (TGIF) will fund a comprehensive cooling tower inventory, which identifies system type, controls, water treatment type, and chemical usage, as well as an indication of overall water usage, strainer and basin health of the cooling towers. Physical Plant-Campus Services will use the data to identify water and energy conservation opportunities and develop a campus-wide standard for future cooling tower installations and retrofits.

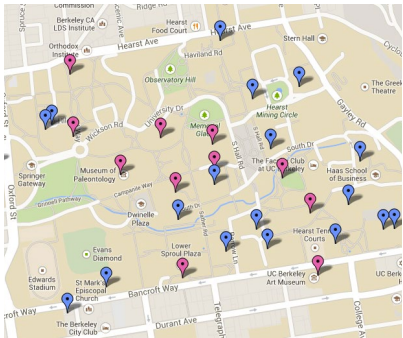
Residence Hall Water Use Declines

Water use in residence halls, adjusted for the number of residents, has declined by over 35% in the last ten years. While new residence halls have been built to address affordability concerns, efforts to install more water-efficient technologies and to encourage residents to use less water have also contributed to this dramatic and unexpected decline.



New Water Bottle Refill Stations and Fountain Bottle Fillers Funded by TGIF

There are a lot of reasons to love Berkeley’s tap water. It’s sourced from Sierra Nevada snowmelt, it tastes good, and it’s free. It’s now easier than ever to drink tap water, with new water bottle refill stations installed throughout the campus. TGIF funded refill stations in Sproul Hall (first floor), Wheeler Hall (first floor), and Kroeber Hall (by the Hearst Museum of Anthropology). Several departments have also added refill stations including Barrows Hall (ground floor) and Hearst Gymnasium (next to the west entrance). TGIF also funded bottle fillers on existing ADA-compliant water fountains, a cost-effective solution allowing more installations, all shown on the refill stations [map](#).

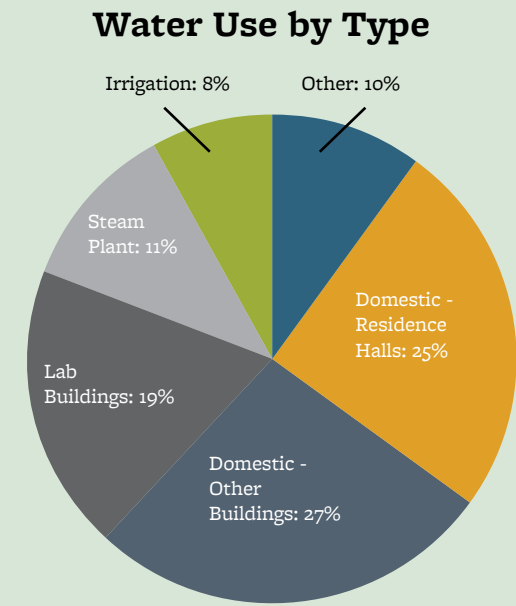


UC Berkeley Goal

Reduce potable water use to 10% below 2008 levels by 2020. Double the water use reduction target if the local utility provides a non-potable source of water for irrigation.

System-Wide Goal

Reduce potable water consumption adjusted for population growth by 20% by the year 2020. (UC Berkeley baseline: Average over FY2003-2005)



Water at a Glance

New construction and major renovation projects will maximize the number of water use reduction credits as part of the LEED™ certification process.

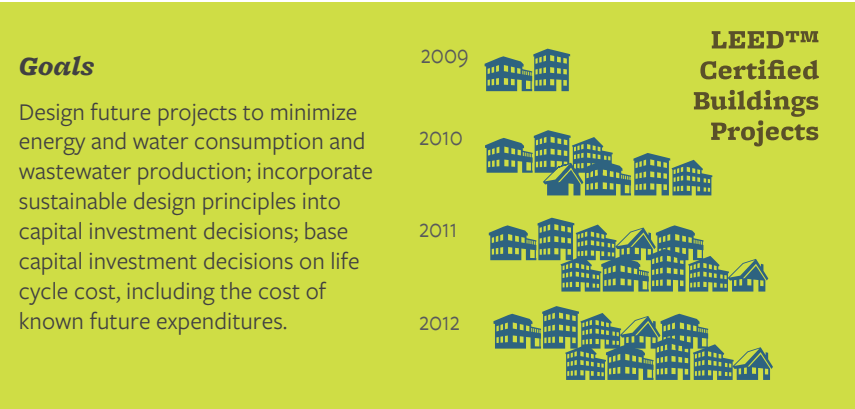
The campus implements Stormwater Pollution Prevention Plans for all campus construction projects to manage stormwater runoff and protect water quality.

[I Heart Tap Water](#), a partnership between Cal Dining, Recreational Sports, Environment, Health & Safety, and University Health Services promotes tap water as the preferred beverage of choice and educates the campus through a website, newsletters, Facebook, posters, and an on-line pledge.

There are at least 21 water bottle refill stations on campus in public areas. There are also several “bottle fillers” retrofitted to existing ADA-compliant water fountains with more being added.

Built Environment

New Energy Policy creates leadership for renovation projects



The campus currently has **ten (10) LEED™ certified building projects, representing almost 7% of total square footage.** In addition, ten projects, including ones recently completed as well as in construction, are registered and expected to be certified by 2015, reflecting 850,000 square feet more of LEED certified campus space.

Campus construction projects 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 LEED™ Gold, and required to achieve Silver certification at a minimum. For laboratory construction and renovation, campus designers consult the Labs21 performance criteria. New building and major renovation projects are required to outperform local energy codes by at least 30%. Though not mandated, the campus encourages innovation in specific projects around the use of low-flow plumbing fixtures. Irrigation standards now incorporate the use of weather sensitive irrigation systems. As a result, most construction projects readily achieve credits in the Water Efficiency category.

A new **Energy Use Policy** has been approved by the Energy Management Initiative (EMI) Steering Committee (February 2013) and the Campus Enterprise Risk Committee (April 2013), which is the campus administrative committee responsible for policies. The policy will be issued by Vice Chancellor Denton and is expected to be effective January 1, 2014. The Policy provides a local framework

All major building projects¹² are registered with the Green Building Certification Institute and are submitted for LEEDTM certification. To further support the campus commitment to transparency and high performance in green building standards, Capital Projects is developing new tools to further integrate green building practices into campus processes for smaller capital projects. Key components are a campus certification program for smaller projects that fall below the threshold for LEED certification, and a set of guidelines that will update campus design standards to promote higher performance for building green.

to support energy-efficient decisions in accordance with the EMI. The intent of the policy is to create campus leadership on environmental stewardship congruent with the campus’s standing in education, research, and public service, and outlines new energy conservation schedules for heating, cooling, and ventilation; lighting; equipment, including computers; and construction and renovation projects.

The Policy aligns with previously adopted campus environmental and sustainability goals and campus workplace safety and accommodation policies. It creates some new requirements for campus departments, including an Energy Office review of projects and the prohibition of “once-through water” process cooling. To encourage climate-appropriate design, mechanical air conditioning will be permitted only when required for programmatic reasons, and requires the approval of the Vice Chancellor for Facilities Services.

The Policy also establishes an aspirational “No Net Increase” energy goal to direct energy performance goals for renovation projects, meaning the proposed project would not result in an increase in the building’s metered energy use, or, if it necessarily results in a net increase, that energy conservation measures or on-site energy generation are included in the project to offset the expected increase. This is an aspirational, but achievable, challenge for the campus, and is necessary to stem the increase in energy use, consumption, and cost of the past decades.

Overall Sustainable Design Best Practice Award: UC Berkeley, Maximino Martinez Commons The newly-opened Maximino Martinez Commons (MMC) Residence Hall won a [Best Practice Award](#) for Overall Sustainable Design at the California Higher Education Sustainability Conference. MMC is certified LEED™ Gold and is named in memory of a longtime staff member. The award was given for “demonstrat[ing] exemplary integration of design principles with the building’s purpose.” The building features include natural ventilation and daylighting, and performs at almost 50% better than code requirements.

Li Ka Shing Wins a “Go Beyond” Award from Labs21 The Li Ka Shing Center for Biomedical and Health Sciences was honored with a new construction award for its sustainable innovations. The Center is a 200,000-square-foot science building that houses a vivarium, brain imaging center, teaching laboratory, 300-seat auditorium, conference rooms, interaction areas, and offices. The center was built to Labs21 Environmental Performance Criteria guidelines and attained LEED™ Gold certification. Its sustainable features include a high-performance envelope, advanced daylighting and controls, reduced air changes in laboratory spaces, low-pressure-drop filters, night purge ventilation, and variable frequency drives on all motors.

Upgraded Classrooms Promise Student-Friendlier Experience “As thousands of UC Berkeley students returned to campus in the fall of 2012, staff were busy putting the finishing touches to scores of newly renovated classrooms in readiness for the fall semester. The renovation of 37 general-assignment classrooms in 10 buildings — Barker, Barrows, Evans, Hildebrand, Latimer, LeConte, Tan and Wurster halls and Donner Lab and Genetics and Plant Biology — targeted improvements in functionality, aesthetics, and comfort. Old furniture, fixtures, and fittings were repurposed, donated, or recycled.¹³” All paints and coatings used were low/no VOCs, and all lighting installed was energy efficient.

Lower Sproul Redevelopment Status The Lower Sproul Redevelopment project – now under construction – will revitalize the area around Lower Sproul into the heart of student life on campus, and create a central meeting place where students can congregate, socialize, study, work, and debate. The project has been designed to be resource-sensitive, with highly efficient water and energy systems. Energy design strategies will help to reduce energy use and permit passive strategies that reduce the need for artificial lighting and mechanical HVAC systems, targeting a 28% reduction in energy costs from current levels. The design also includes energy-conserving plugs and lights in personal study spaces, and a photovoltaic array that will produce at least 1% of the building’s energy and possibly up to 5%. The project will divert 98% of construction, demolition, and land clearing waste (mostly concrete) from landfills and incineration facilities towards reuse. A minimum of 50% of all wood products used will come from a supply chain certified by the Forest Stewardship Council (FSC). The construction is scheduled to be complete in fall 2015.



Li Ka Shing Photo Credit: Keegan Houser



12. Defined as total project cost >\$5million.

13. Excerpt from Roibín Ó hÉochaidh, NewsCenter, “Upgraded classrooms promise student-friendlier experience,” August 30, 2012.

A First for UC Berkeley Alumnae Hall on Haste Street, adjacent to the new Anna Head student housing, has been renovated and seismically upgraded. The project is notable in that it is the first campus project of its small scale to participate in the PG&E Savings by Design program. Savings by Design is a program administered by California utilities, which encourages high-performance, non-residential building design and construction. Through the program, Berkeley receives financial incentive to help offset the costs of energy efficient buildings. Equally important, the program provides information about the life cycle cost and operating expenses of the energy-using systems to inform decision-making. The Alumnae Hall project was designed to perform 10% better than required by code.

Campbell Hall Status This new seven story, 89,000 square foot facility is designed to meet sustainability and energy efficiency goals and to achieve LEED™ Gold (New Construction) certification. The upper levels will house low-intensity laboratories, academic offices, instructional spaces, and a rooftop telescope observatory. The below-grade level will incorporate low-vibration physics research laboratories and associated support functions. The building's structural system has unique sustainable properties based on the use of a mixture of fly ash and slag in concrete (15% slag and 40% fly ash), and incorporates post-tensioned concrete walls that return to plumb after a significant earthquake, achieving a cost savings of more than \$400,000 (\$4.50/square foot) and improved performance.

Certified Building Professionals As of 2012, there are fifteen LEED™ accredited professionals working at Capital Projects, and dozens more within the academic and research units. All Capital Project Managers have attended LEED™ Project management training and education in using the green building certification system. Several members of the campus community, including both students and staff, are actively pursuing LEED™ professional accreditation. As of July 2013 at least six students and one staff have achieved this and several more plan to obtain LEED™ professional accreditation this academic year through the Building Sustainability @ Cal program's TGIF grant and support from the Vice Chancellor of Facilities Services.



Built Environment at a Glance

UC Berkeley has five Gold certified LEED™ building projects (four Commercial Interiors renovations and one New Construction), four Silver (two New Construction and two renovations) and one certified building project (New Construction). There are an additional ten capital projects that are in review, design, or construction.

The student-run [Building Sustainability @ Cal](#) program has developed sustainability plans for at least 28 campus departments and three construction projects.

Indoor air quality questions and complaints are handled by a full-time industrial hygienist. The campus routinely achieves almost all of the available LEED credits for Indoor Environmental Quality.

The Maximino Martinez Commons building is powered in part by about 10,000 therms of solar water heating, although the campus does not retain the environmental attributes for this energy.



“Working towards sustainability can seem daunting and discouraging at times, but that does not stop the Berkeley community from pursuing with new, innovative ways to achieve environmental success. We are not in competition with one another, but rather working together towards this common end of sustainability.”

Rachel Balmy, Student

Waste

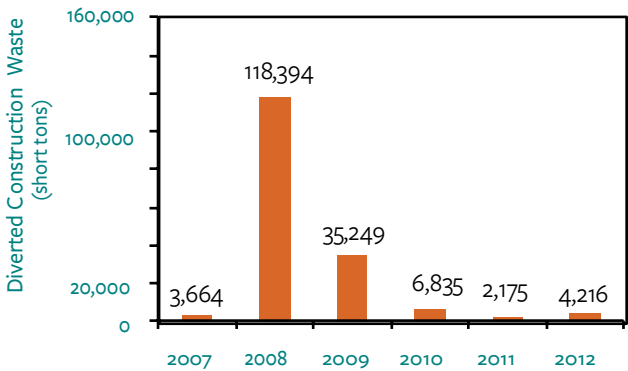
Partnerships are key to action and progress



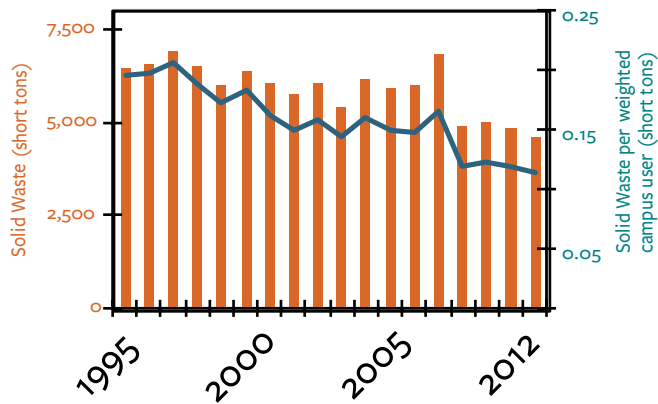
In 2011, the Chancellor’s Advisory Committee on Sustainability (CACS) commissioned a study in partnership with Campus Recycling and Refuse Services (CRRS) and the Office of Sustainability to review current waste disposal practices and identify the challenges and opportunities available to the meet the campus zero waste target. This research found that the campus can likely reach a 75% diversion rate by expanding existing programs, particularly food, food container, and paper towel composting program and education efforts. The campus is currently developing a Zero Waste Plan that identifies current and future strategies, provides design guidelines, and outlines the steps needed to reach zero municipal solid waste.

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 has a hazardous waste and waste minimization plan that includes e-waste. Funded by the [Campus Recycling and Refuse Services](#), the student-managed [ReUSE](#) program operates around 18 on-campus reuse stations for office supplies and the annual Second Chance clothing sales and reader giveaways. ReUSE projects reduce waste by 2-5 tons annually. The campus also works to reuse office supplies, equipment, and vehicles through the [Overstock and Surplus Den](#).

UC Berkeley has successfully worked to reduce the amount of waste sent to landfills over the last two decades. Despite these efforts the campus municipal solid waste diversion rates have remained below 50%, even though the campus is committed to reaching zero waste by 2020. The total diversion rate for campus is 62%, however, **the diversion rate when construction waste is excluded dropped this year to 42%.** The amount of solid waste sent to landfills by the campus went down by 4% last year, and has dropped by 28% since 1995.



Waste diversion from construction varies dramatically depending on the type and number of projects in a given year.



Recyclemania Victory for Basketball The campus received an award for the [highest diversion rate](#) for a basketball game from Recyclemania. The March 2013 game versus Stanford was designated Zero Waste and achieved an impressive 97% diversion rate. Volunteers and CRRS employees were “trash talking” at several sets of compost, recycling, and landfill bins placed around Haas Pavilion, advising patrons on how to dispose of their waste. The workers also had signs they held throughout the game promoting Zero Waste and Recyclemania. This was Berkeley’s first Recyclemania win.



Launch of New “Clean-Up” Services A newly formed collaboration aims to improve the use of space on campus through a “Campus Sustainable Cleanup” effort. The program helps departments free up underutilized space by clearing out un-used materials and coordinating their recycling and reuse. Led by Ron Holmstrom, Space and Capital Resources, the team also includes Overstock and Surplus, Moving Services, ReUSE, Campus Recycling and Refuse Services, Records Retention Services, CAL Shredding, EH&S, and Mail Services. The results of the Earth Week launch in Barrows Hall were impressive: 1,000 square feet re-purposed by the departments, 3,430 pounds of paper shredded and recycled, and 13 boxes of ReUSE materials. One participant noted that “I was able to get rid of stuff that had been sitting around for last 20 years.”



New Campus Trash & Recycling Cans Excel in Design & Safety In 2009, the desire to improve waste collection sparked a unique approach to addressing campus needs. Outdated trash cans posed a mounting problem to Physical Plant-Campus Services crew, who incurred injuries from heavy lifting when collecting refuse. After considering existing alternatives for side-access-only bins, Theron Klos, grounds manager, lead the initiative to have Berkeley create its own solution. Seeking help from the sustainability community,

environmental design students designed a trash can that excelled in all categories: waterproof, vermin-resistant, safer, and durable. Moreover, the campus invested in a new vehicle to improve collection efficiency. With the first installation of the new bins, the campus moved another step forward in achieving zero waste by 2020. Read [more](#), or visit the TGIF [website](#).



Photo courtesy of Greg Ryan

On America Recycles Day, EPA Recognizes Campus Food Waste reduction “UC Berkeley is doing such a good job of recycling that on Thursday, November 15, 2012 – America Recycles Day – the regional administrator of the Environmental Protection Agency came to campus to praise Cal Dining’s efforts to reduce the food waste stream. At a press conference, Jared Blumenfeld, who oversees the EPA’s Pacific Southwest region... announced that UC Berkeley is one of 19 colleges and universities in the region to sign up for the Food Recovery Challenge. The voluntary program aims to limit wasted excess food nationwide through donations to charity, reducing consumption, and increasing composting¹⁴.”



Picture of Cal Dining staff, EPA regional administrator, Jared Blumenfeld; Photo by Jean Smith

Recycling on Campus Tennis Courts Sixteen new recycling containers were installed at Hearst and Channing Tennis Courts. The student-run Zero Waste Research Center and Cal Women’s Tennis Team are also working with Project Green Ball and ReBounces to reuse old tennis balls through a re-pressurizing machine or recycling the material into other surfaces such as equestrian turf.

14. Excerpt from Robert Sanders, NewsCenter, “On America Recycles Day, EPA recognizes campus food waste reduction,” November 15, 2012.

Spotlight on Plastic Waste¹⁵

While conducting a “waste audit” on select campus trash bins, sustainability-minded Berkeley students discovered not just to-be-expected coffee-cup lids but a surprising assortment of oddball plastic items, from plastic bags to pipette trays and contact-lens cases.

“I had a whole team of four trying to figure out what each plastic was,” recalls fourth-year student Kristen Klein, coordinator of the Zero Waste Research Center, a project funded by students via a grant from The Green Initiative Fund (TGIF).”We separated the plastics out, Nos. 1 through 7,” and wrote a “huge report” on the campus’s plastics footprint, she says.

The campus is striving to meet the UC system’s aggressive sustainability goal of “zero waste” by 2020. And last year Berkeley became the first university in the world to sign onto the Plastics Disclosure Project, committing itself to track the lifecycle of plastics used on campus and to reduce its plastic waste.

Klein’s student team — via its unglamorous trash audits and time-consuming efforts to ascertain each plastic’s origin and ultimate fate — collected much of the baseline data for the first disclosure report, which is currently being finalized.

So what did we discover from the plastic trash audits? Plastic material comprises between 15-50% of landfill waste by weight, based on a sampling of representative campus buildings, including Crossroads Dining Hall, Haas Pavilion, and Stanley Hall. These percentages show a vast amount of non-recyclable, non-compostable plastics on campus to be addressed.¹⁶

Reducing Plastic Waste – A First Step Pens, in particular, caught the attention of the students and staff committed to waste reduction. By weight or volume, they make up only a small fraction of the trash the campus sends to landfill. But this cheap, disposable writing tool — ubiquitous on a campus and typically made of “virgin” (vs. recycled) plastic — is a poster child for the throw-away mentality that zero-waste advocates decry.

A new recycled content pen with refillable ink is now debuting on campus and is hoped to replace the disposable versions.



Waste at a Glance

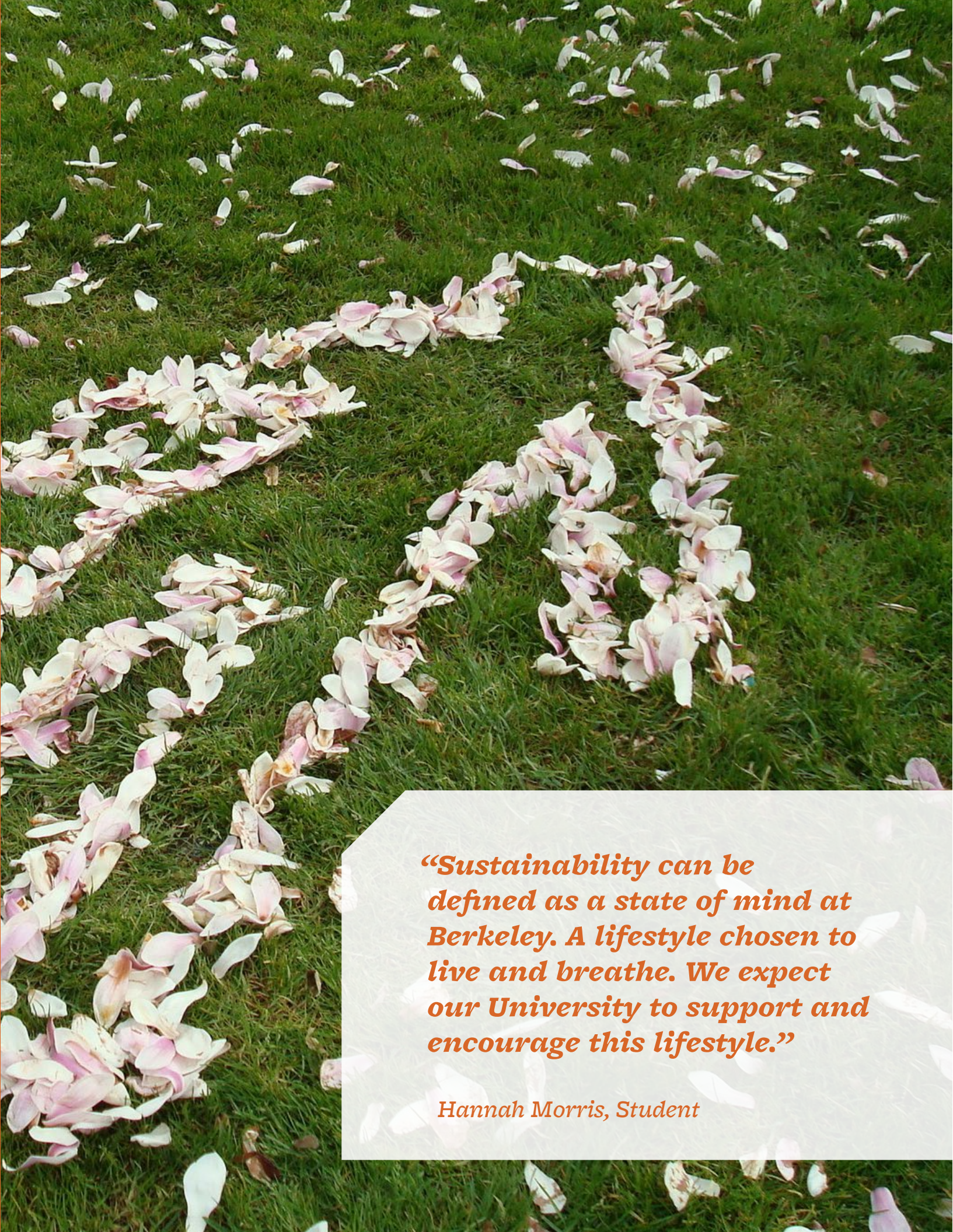
Hazardous waste generation and disposal dropped slightly this year to 184 tons (including asbestos and lead construction waste).

Mail Services and others work with vendors such as Ecological Mail and Intra Mail network to reduce unwanted mail.

Every October, Mail Services partners with the Office of the CIO to promote Campus Data Cleanup Month.

The College of Chemistry Chemical ReUse program dispensed 2927 chemical reagents last year.

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.



“Sustainability can be defined as a state of mind at Berkeley. A lifestyle chosen to live and breathe. We expect our University to support and encourage this lifestyle.”

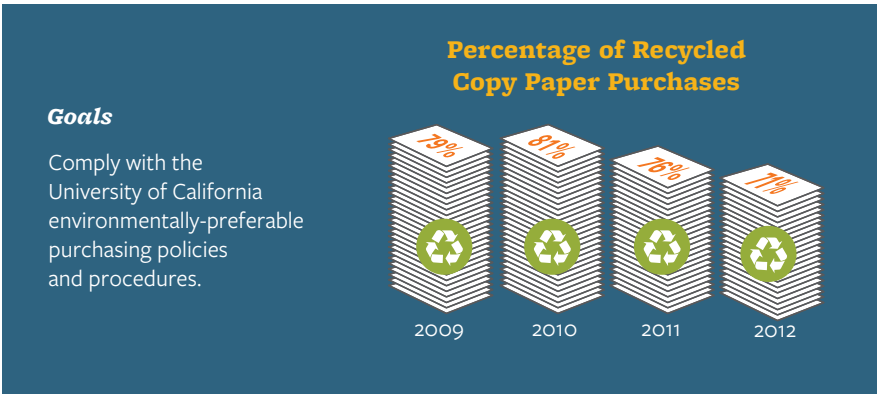
Hannah Morris, Student

15. Unless noted, excerpt from Cathy Cockrell, “Reuse, recycle, refill: writing the future with green pens,” October 11, 2012.

16. Data from draft Plastic Disclosure Report (unpublished)

Procurement

Purchases and reporting continue to improve



UC Berkeley purchased almost \$490 million of goods and services in 2012 which includes (but is not limited to) office products, laboratory supplies and equipment, facility supplies, and food. The total, however, excludes construction-related activities.

Procurement Services is responsible for the acquisition of goods and services for the campus community. As part of this responsibility, Procurement Services oversee related programs – Campus Buyers, Departmental Low Value Purchasing, Card Programs, BearBuy, Strategic Sourcing, and Supplier Diversity – and provide such services as:

- initiating purchase transactions
- managing supplier relations
- providing process guidance and facilitation
- assisting with policy interpretation and compliance
- establishing best practices in campus purchasing activities, including sustainable purchasing

UC Berkeley operates on a decentralized purchasing model in which department users initiate their purchasing transactions in the BearBuy e-procurement system. Department users can conveniently purchase goods or services by shopping from BearBuy using an online catalog or by completing a BearBuy form.

Strategic Sourcing is a University of California (UC) procurement strategy designed to leverage the purchasing power of our collective spend, system-wide or campus-wide, for common purchases and to redirect the resulting savings to the University’s mission. Through solicitations and negotiations, the goals are to achieve lower costs of purchasing goods and services, to improve product quality, and to obtain better service levels from suppliers. In compliance with the UC [“Sustainable Practices Policy”](#), Strategic Sourcing supports efforts around sustainable purchasing by

ensuring bids and contracts require suppliers to demonstrate their dedication to sustainable practices, both in their product offerings and business operations.

Where applicable, Strategic Sourcing leverages the University’s purchasing power to target environmentally preferable products and services for volume-discounted pricing to make them cost-competitive with conventional products and services. This approach helps to encourage preferential purchases of such products including Energy Star equipment, recycled content products, and other third-party certified green items, along with providing some guidance to suppliers on minimizing packaging waste and developing take-back programs.

The campus purchased at least \$14.4 million of environmentally-preferable products last year. The increase – 60% in three years – is due to multiple factors, including better reporting from some vendors, the inclusion of more vendors who now flag green products, and also increased purchases due to staff efforts and engagement. Approximately one-third of these purchases were sustainable food. The campus also monitors the percentage of spend on environmentally-preferable products by product category, although we are often only able to compile data from major vendors and so do not include all purchases:

- Percentage of copy paper purchases with recycled content: 71%
- Percentage of office supplies with recycled content: 38.2%
- Percentage of office furniture with recycled content: 50%
- Percentage of computers, EPEAT certified: 100%
- Percentage of janitorial supplies (Green Seal or recycled content): 51%

Upcoming projects include the launch of a contract with America To Go (which will include sustainability information for participating caterers). America To Go will be implemented as a punch-out catalog in BearBuy for purchasing food for business meetings and other campus events from contracted local catering companies and restaurants. Procurement Services is also investigating alternative compostable kitchenware.

Making Sustainable Purchasing Easier

There are numerous factors in deciding on which office furniture to buy: comfort, style, ergonomics, price. Steelcase launched its office furniture SMART catalog in BearBuy to help buyers with their purchase selection of seating, storage and work tools. In addition to deeper discounts and quicker delivery lead times, the majority of the SMART catalog items are third-party certified as sustainable.

Procurement at a Glance

Procurement Services has also implemented a program to substitute recycled content copy paper for virgin copy paper using the search function in BearBuy.

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.

Select departments participate in a reusable bin program through its primary office supplies vendor, which has reduced the number of cardboard boxes used in FY12-13 by almost 1,000.

Procurement Services runs an annual printer exchange program which has recently removed over 60 older inefficient printers from campus in exchange for new Energy Star certified models.

Food

Innovation leads to new to-go containers and improved purchasing



Food service is an important category of impacts on the campus, in part due to the student interest in the purchasing, waste, and engagement components. The UC Berkeley Sustainable Foodservice Working Group was formed in the spring of 2009 to work with campus foodservice operations and the campus at large to increase the sustainability of food purchases and operations. The Working Group has implemented elements of its workplan on sustainable foodservices practices and set campus-specific policies and guidelines in the same area.

Campus vendors continue to show leadership in their percentage of purchases of sustainable food, and reported percentages this year have increased by several percentage points to 28%. The Office of Sustainability again asked all vendors to track and report the percentage of their food budget spent on sustainable food, with four submitting data ([Cal Dining](#) and three other vendors, representing the majority of food sales on campus). The data on purchases is presented two ways. The first number includes purchases that are locally grown, organic, fair trade, or humane (in accordance with UCOP policy) – this percentage increased by four percentage points to 28%. The second number also includes purchases produced by locally-owned businesses – this number also increased in the last year. Interestingly, 15-20% of the purchases meet the criteria for two different categories.

The increase in sustainable food purchasing is in part due to receiving more accurate numbers from distributors, as well as the growth in total food sales by the reporting vendors (allowing for greater purchases of some sustainable food). In addition, the purchases of Marine Stewardship Council certified seafood by Cal Dining increased. One vendor reported using the Good Guide (developed by a UC Berkeley professor) to screen individual food products.

Upcoming projects include the launch of a sampling program in the dining halls. Students can receive a sample of the food before they take a whole portion so they don't end up throwing away their entire serving if they don't like it. This will decrease the amount of post-consumer waste. Finally, the Cal Dining Student Sustainability Team held their second annual Food Day in October 2013 and plans to increase its impact by making it larger and improving the event advertising.

“Chews”-ing to Reuse! Patrons of Cal Dining’s residential eateries will have a new way to “go green” this spring. After a successful pilot in Foothill Dining Commons last semester, Cal Dining has decided to expand Chews to Reuse, their reusable to-go container program. The process is simple: pay a one-time fee of 3 meal points, grab a container, and take the meal to-go. When ready for the next takeout meal, a sanitized container is swapped for a rinsed one at the register. Compostable containers are still available for purchase at all Cal Dining facilities. The program is helping the campus reach zero waste by 2020 and requires fewer meal points than single-use containers over a semester.

CACS Sustainability Award Winner Monica Harnoto (Environmental Sciences, spring 2013) Monica is never merely content with the status quo and constantly inspires and motivates colleagues to think of new and innovative ways to improve sustainability in Cal Dining. One of Monica’s most notable projects has been Chews to Reuse -- a reusable to-go container program in dining halls. Before Monica created this program, the dining halls provided patrons with compostable to-go containers made from sugarcane plant fibers. Starting out as a pilot, the program has now been expanded to all dining commons, in large part due to Monica’s strategic implementation. *Photo credit: Michael Drummond*

Cal Dining’s LeanPath Pre-Consumer Waste Reduction System won a [Best Practice Award](#) at the California Higher Education Sustainability Conference. Employees use a scale and touch screen terminal to weigh and log information on food waste. The team uses data summaries to identify areas generating the most waste and can then work to reduce that waste. The program has enabled Cal Dining to cut down their pre-consumer food waste by 33% so far. Cal Dining also received a “Waste Reduction Excellence in Institutional Food Service” award from StopWaste.

Food Day at Cal—A Smashing Success! On October 24, 2012, UC Berkeley participated in a celebration of [Food Day](#), a national campaign for healthy, sustainable food. Students, staff and faculty on campus were encouraged to participate in the [UC Eats Real Pledge](#), vowing to eat real, healthy and sustainable food for the day, week, or more. Environmental and food justice related clubs dominated Upper Sproul, encouraging passersby to stop by and learn about Food Day and their clubs. The day also included cooking demonstrations, snacks and coffee provided by vendors, and musical entertainment, all organized by the Cal Dining sustainability interns. (TGIF [website](#))

Journalism C103 - Edible Education: Telling Stories About Food and Agriculture As the costs of our industrialized food system become impossible to ignore, a national debate over the future of food and farming has begun. Telling stories about where food comes from, how it is produced (and might be produced differently) plays a critical role in bringing attention to the issues and shifting politics. Each week a prominent figure in this debate explores what can be done to make the food system healthier more equitable, more sustainable, and the role of storytelling in the process. Instructor: Michael Pollan.



Food at a Glance

The [Berkeley Student Food Collective](#) provides fresh, local, healthy, environmentally sustainable and ethically produced food at affordable prices to the Berkeley campus and greater community.

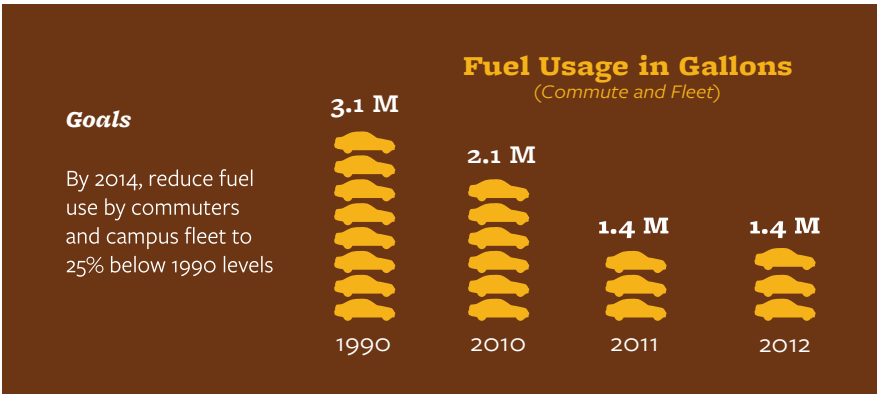
The [ASUC Sustainability Team](#) runs The Local, an organic vegetable and fruit stand.

The [Eat Well Berkeley Initiative](#) integrates sustainable food practices with nutrition guidelines for healthier meetings, vending machines, catering, and restaurants. Recent accomplishments include the launch of the Eat Well Berkeley Restaurant program at Pat Brown’s and QualComm Café, two Cal Dining Retail campus restaurants.

Over 60% of certified [green events](#) have served sustainable food.

Transportation

Fewer vehicles, fewer miles, less fuel



UC Berkeley offers a comprehensive package of programs to encourage moves to more sustainable forms of transportation – all with the goal of reducing traffic and parking demands. The [New Directions](#) program offers a suite of alternative commute benefits to UC Berkeley faculty, staff, and students. The program offers bus pass programs, transit subsidies, discounted carpool parking pricing, pre-tax purchases, regional ride-matching services, and a host of other benefits and incentives. In addition to these established programs the campus is continuing to explore new programs as a part of its [Parking and Transportation Demand Management \(TDM\) Masterplan](#).

There are at least two campus committees related to transportation. The Chancellor’s Joint Oversight Committee on Parking independently evaluates the effectiveness of the Department of Parking and Transportation in meeting the needs of the campus community, with an overall charge to provide oversight of the operational and fiscal aspects of Parking and Transportation on the campus. The Campus Bicycle Committee is appointed to formulate and recommend policy, guidelines, and procedures concerning bicycle use on the Berkeley campus. A subgroup of the Campus Bicycle Committee is preparing a status report on the 2006 Campus Bicycle Plan.

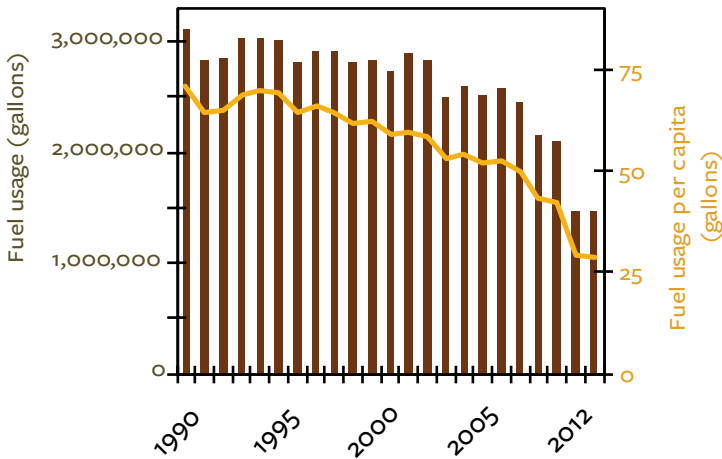
Fuel use from fleet and commute is below 1990 levels by over 50%, exceeding the campus goal. Recent transportation surveys revealed that the campus commuters are driving shorter distances than previously thought, reducing the amount of fuel used. Miles flown on business air travel remained essentially the same in 2012. The percentage of green vehicles in the fleet has

17. <http://pt.berkeley.edu/about>

Transportation choices made by campus stakeholders – either in terms of vehicle fleet use, commute patterns, or shuttle bus operations – can impact the environment and congestion on already overcrowded roads. To mitigate these impacts, the UC Berkeley Parking and Transportation Department set a goal to “implement sustainable transportation alternatives to reduce vehicle congestion and promote clean air.”

risen to almost 23%, and **Fleet Services is on track to reach its goal of having 25% of the fleet green by 2014.**

The results of our efforts have changed the transportation practices on campus over time, such that 83% of faculty, staff, and students commute by walking, biking, ridesharing, or public transit. In fact, 20% of faculty now say they bike to campus. The campus currently has 4,500 bike parking spaces and added at least 2,300 more bikers in recent years. There is indoor bike storage in at least two buildings and four parking garages. In addition, more people walk to campus than drive alone or any other commute mode. Similar improvements can be seen in the vehicles owned or operated by the campus. As of December 2012, the campus owned 533 fleet vehicles, 22.9% of which are considered green.



Campus Embraces On-line Care Share Program Cal Zimride, launched in 2010, has over 4,400 UC Berkeley members, providing an innovative rideshare service for making one-time and on-going ride matches. Using survey data of users as well as EPA estimates, Zimride estimates that the campus has saved over 8,000 gallons of gasoline¹⁸. Cal Zimride is ranked in the top 10 of total users out of Zimride partners, ranked in the top 10 for first-time users, and is the first university to brand the program and create an identity.

Bicycle Fix-It Stations Do you need a quick tune up on your bike? UC Berkeley’s second fix-it-yourself bike repair station is ready for use outside Moffitt Library. Along with the station near the Energy Biosciences Building the corner of Oxford and Hearst, the Moffitt station includes air pumps, tools, and instructions to make basic adjustments and repairs. Installed by Parking and Transportation, the stations are free and available for the entire campus community.

Berkeley Recognized for Being a Bicycle Friendly Campus [League of American Bicyclists](#) has recognized UC Berkeley as one of nation’s top Bicycle Friendly Universities (BFU) for promoting and providing bicycle-friendly campus for students, staff, and visitors. UC Berkeley was one of only eight universities recognized in California, and one of [fifty-eight nationwide](#). “It’s a great honor to receive this award from the League,” said Greg Haet, Chair of the Campus Bicycle Committee at Berkeley. “The number of students, faculty, and staff coming to the campus by bicycle continues to increase, and we’re working hard to make Cal a better place for our growing cycling community. This award confirms that we’re on the right track, and motivates us to continue making improvements.”



| Alternative Mode Splits at UC Berkeley, 1990-2011 | | | |
|---|-----------|-----------|-------|
| | 1990/1992 | 2005/2006 | 2011* |
| Faculty and Staff | 1990 | 2006 | 2011 |
| Drive alone | 60.0% | 47.1% | 44.2% |
| Walk | 12.0% | 7.7% | 8.5% |
| Transit | 12.0% | 24.3% | 22.8% |
| Bicycle | 5.0% | 7.5% | 9.7% |
| Rideshare | 10.0% | 11.5% | 11.9% |
| Other | 1.0% | 1.9% | 2.0% |
| Students | 1992 | 2005 | 2011 |
| Drive alone | 10.7% | 8.0% | 5.3% |
| Walk | 45.5% | 46.8% | 63.2% |
| Transit | 18.8% | 31.9% | 16.6% |
| Bicycle | 16.7% | 9.4% | 12.2% |
| Rideshare | 4.4% | 2.7% | 1.2% |
| Other | 3.9% | 1.2% | 0.7% |

Mode Splits: Transportation surveys, which are used to estimate mode splits, are generally conducted every three years. * 2011 was the most recent survey and has been adjusted to reflect more accurate mode splits.

18. Parking and Transportation data, <http://www.slideshare.net/ucberkeleybas/parking-and-transportation-wow-showcase>.

19. Public Policy Institute of California, <http://www.sfgate.com/bayarea/article/Most-Bay-Area-commuters-drive-to-work-alone-4699761.php>

Transportation at a Glance

Bicycal is a student-founded organization that aims to empower UCB students, faculty and staff to successfully integrate the bicycle into their daily lives. They provide a space where members can learn how to maintain, operate and love their bicycles in an inclusive and safe space.

UC Berkeley has a variety of car sharing services on or adjacent to campus, including City CarShare, Zipcar, and Enterprise Rent-a-Car.

The recent transition to a new Campus Shuttle vendor has brought nine fuel-efficient buses and vans.

Marks of Continuous Improvement

The drive alone rate for campus faculty and staff (44.2%) is well below the average of Bay area workers (56%), according to a recent survey¹⁹. The campus works to maintain this advantage through a range of projects.

The campus provided matching funds to support the City of Berkeley’s successful grant application for \$12.7 million for street improvements to Hearst Avenue and Shattuck Avenue. Construction of a new protected bicycle lane on Hearst Avenue and of pedestrian enhancements in Downtown Berkeley are expected no later than 2017.

In addition, an outreach event was held at the University Garage to promote alternative transportation incentives offered by Parking and Transportation to drivers affected by the garage’s closure.

Land Use

Sustainable planning helps achieve broader goals

The campus works to ensure that major projects reflect established campus planning and land use principles. Physical and Environmental Planning (PEP) within Capital Projects/Facilities Services provides comprehensive general, environmental, and project planning services for the Berkeley campus. PEP is also responsible for conducting a regular housing and transportation survey of staff and students, and for ensuring that the campus is in compliance with the state-mandated California Environmental Quality Act (CEQA). PEP’s planning efforts, focusing on facilities, infrastructure, transportation, recreation and open space, and environmental management, are guided by the campus’ Long Range Development Plan (LRDP) and its updates. The current LRDP, known as the 2020 LRDP, was approved by The Regents in January 2005.

The 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. From the LRDP, the campus goal is to plan every new project to serve as a model of resource conservation and environmental stewardship, using a range of key strategies (see the [2009 Campus Sustainability Plan](#) for more details). The LRDP and EIR also help establish basic project parameters, such as no net increase in stormwater runoff over pre-project conditions (2020 LRDP Continuing Best Practice USS-3.1); or the requirement that the scope and budget of each project include consideration of bicycle improvements (2020 LRDP Continuing Best Practice TRA-1-b).

Of general education campuses in the UC system, at approximately 180 acres UC Berkeley has the smallest physical core campus area; for contrast, UCLA’s campus has 378 contiguous acres. Therefore, resource conservation in land use planning at UC Berkeley is always a key consideration; this can partially account for the perception that the campus is continually under construction, as older or seismically poor building sites are reused for new programs in updated space. Intensification of development on existing developed space in an urban area well served by regional transit is a fundamental sustainable land use principle embraced at UC Berkeley.

Examples of sustainable land use planning efforts include the Lower Sproul Student Community Center (now under construction), and the Richmond Bay Campus, in partnership with Lawrence Berkeley National Laboratory (LBNL). Efforts are also on-going for the implementation of the [Strawberry Creek Management Plan](#). PEP also provides planning support for research reserves managed by UC Berkeley, such as the system’s newest reserve, [Blue Oak Ranch](#), near San Jose, California.

Since 2008 and ongoing, UC Berkeley has pursued grant funding from the Federal Emergency Management Agency to help reduce fire fuels in the hill area above UC Berkeley. The effort responds to a history of catastrophic fire in the hills, and conditions made more hazardous by the fire fuel characteristics of prevalent introduced species such as eucalyptus.

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 students, staff, and faculty as well as alumni and campus neighbors. There is also a native plant nursery and garden to support the restoration of Strawberry Creek.

Richmond Bay Campus In collaboration with Lawrence Berkeley National Lab , UC Berkeley has published a Community Draft Long Range Development Plan (LRDP) and an environmental impact report on the LRDP for the Richmond Bay Campus (see [richmondbaycampus.lbl.gov](#)). The LRDP establishes overarching goals and strategies to guide the long-term development of the Richmond Bay Campus through the year 2050, and promote the achievement of ambitious sustainability goals in a manner that is transparent, uses resources efficiently, and cultivates a living laboratory where operating practices and infrastructure, facilities performance monitoring data, and sustainability goals are leveraged to engage, apply, and strengthen research. The LRDP also addresses remediation of legacy site contaminants and preservation of 25 acres of natural open space, while providing development capacity for up to 5.4 million gross square feet of program space.

100 Volunteers Help Plant 200 Redwoods and 100 Toyons by Campus With the committed efforts of the campus fire mitigation committee, a patch of eucalyptus trees deemed hazardous was recently removed near the Lawrence Hall of Science. To reduce fire hazards and restore natural lands, campus practice is to cut down the eucalyptus trees, masticate the felled wood, and spread the resulting mulch on site, so the biomass is able to be retained and recycled back into the soil. This practice also serves to control erosion and sediment deposition into creeks until a new floral community is established. The hillside stood naked for several months, but a group of volunteers came out to help restore some of the hillside’s natural ecology. Two hundred redwood trees and one hundred toyons were planted by campus and community members. The trees were donated

by the College of Natural Resources, potted by the Fire Mitigation Committee, and then grown in a lath house through the voluntarily efforts of the College of Engineering, the Lawrence Hall of Science, and Recreation Sports staff. Read [more](#).

Lower Sproul Redevelopment Status, continued The project now in construction includes measures such as rainwater harvesting, and a rain garden to capture storm water and filter and slow its release into the creek, improving the health of Strawberry Creek and the San Francisco Bay. During the rainy season, excess water will

Land Use at a Glance

In recent years, the campus has converted nearly 68,000 square feet of turf grass area to native or drought tolerant species or to permeable surfaces, reducing the need for irrigation.

At the Richmond Field Station (RFS) the campus coordinated a Bike to Work Day Energizer Station along the Bay Trail, and a new ESPM class in Restoration Ecology completed field laboratory activities associated with preventing invasion of native ecosystems by non-native weeds in the coastal terrace prairie.

At RFS, 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.



flow back into Strawberry Creek through the rain garden and filtering system instead of storm drains, which slows the water and helps to preserve the natural ecology. Storm water runoff from Eshleman and Sproul Plaza will be collected into a retention basin stored in the garage. This water will be used to flush toilets in Eshleman and building gray water will be re-used for irrigation. By using low-flush and low-flow fixtures for water closets, urinals and non-potable water, the building's water consumption will be reduced 40% from code, with a 50% reduction in amount of potable water used for building sewage conveyance.

Filling the Weed-Shaped Hole Over the past 25 years, the Strawberry Creek Restoration Program (SCRCP) has engaged thousands of UC Berkeley students and volunteers, which has resulted in significant removal of the most problematic invasive species (notably English and Algerian ivy). In more recent years, the SCRCP has begun to shift its focus from invasive species removal to a more comprehensive restoration approach that includes native planting. Removing invasive species without effectively establishing other desired (native) species can leave a “weed-shaped hole” that invasive species can easily recolonize. Ideally, native planting fills this “hole” with a community that supports a higher level of biodiversity. A recent TGIF [grant](#) allowed the SCRCP to host two volunteer days, engage over 250 student and community volunteers in urban creek restoration (over 450 volunteer-hours over eleven events), and remove ivy (and other invasives) from and sheet mulched over 100 meters² of riparian habitat along Strawberry Creek.

Strawberry Creek Update The past year has continued to be a challenging one for Strawberry Creek. While student planting of native vegetation continued at a robust pace, the second drought year in a row stressed new plants as well as aquatic habitat. Additionally, there were two significant non storm discharges that each released several thousands of gallons of water.

One discharge originated off campus from a large construction site when contractor personnel pumped sediment laden water from their site into a storm drain that ultimately reached the North Fork of Strawberry Creek. Excess levels of sediments have a harmful suffocating effect on many creek organisms. The other large discharge occurred when a six-inch diameter underground water pipe ruptured. This type of discharge can be doubly harmful to the creek due to the chlorine and sediment which washed into the Creek.

Both discharges are illustrative of the difficult challenges faced by a watershed that is highly urbanized. Each discharge has different solutions. Impacts from harmful human activities require education, outreach and enforcement to address them, while impacts from an aging and failing utility infrastructure require commitment to replace and repair these pipes and related systems. The positive news from both these incidents and other smaller similar discharges is that both were reported to the Office of Environment, Health and Safety by members of the campus community, resulting in a faster response to the releases.

“The university focuses on addressing problems of enormous consequence to society that make a difference in the future of the world.”

Anonymous, Impressions of Berkeley

Academics & Learning by Doing

Documenting sustainability courses and research

UC Berkeley offers a wide range of degree, course, and service learning options, which allow students to increase their understanding of the complex issue of sustainability. Our 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.

Our core mission – of teaching, research, and public service – provides an opportunity to use the campus as a research and learning laboratory for sustainability. It is not surprising that the Environment – “the impacts of human activity on our planet’s ecosystems, and how to manage and mitigate those impacts” – was one of ten academic themes of exceptional promise included in the [2002 UC Berkeley Strategic Academic Plan](#).

UC Berkeley offers [over 500 sustainability courses](#), according to a recent survey by an intern in the Office of Sustainability. Pascal Polonik spent over 60 hours reviewing the course catalog and researching syllabi to create the list. There are courses on the list from 46 different departments, including Buddhist Studies C126: Buddhism and the Environment, and College Writing 150AC: Researching Water in the West. The Environmental Science, Policy, and Management (ESPM) department has the highest number of courses on the list (115), while Civil and Environmental Engineering has forty-five. This means that around 10% of total courses offer instruction in some aspect of sustainability.

Using new data tools, it is now possible to identify the number of graduates taking these classes. In 2012-13, 26% of undergraduates took at least one course focused on sustainability.

UC Berkeley also offers [almost 75 related degree programs](#) (over 25 [undergraduate programs](#) related to the environment or sustainability and almost 30 [graduate degree programs](#), with almost 20 [minors](#)). The campus supports a large number of research centers related to the environment and sustainability. Spotlights on Research and on Students provide additional information.

A New App Makes Commuters More Aware of Their Environmental Impact “Students and professors at Berkeley’s Department of Civil and Environmental Engineering developed the Quantified Traveler, a smartphone app that tracks users’ daily commute and gives them feedback on how “green” their travel choices are. Users were able to log on to a website to view their data, including levels of CO₂ emission, travel time, money spent, and even calories burned. They could also compare their personalized statistics with those of the average American, the average Bay Area resident, and other participants in the study”.²⁰

Greening the Berkeley Science Review With the help of TGIF [funding](#), the [Berkeley Science Review](#) (BSR) printed the Spring 2012 issue of the publication on 30% post-consumer waste recycled (PCW) paper and the Fall 2012 and Spring 2013 issues on 60% PCW paper. These paper switches saved at least two tons of wood (or 14 trees) and 1,500 pounds of greenhouse gases. The Spring 2013 Review was also issued online using a new format, with an easily-to-browse table of contents. This new format increased web traffic to the BSR site by two-thirds.

Campus Signs Green Chemistry Commitment UC Berkeley was one of 12 colleges and universities to be initial signers of the [Green Chemistry Commitment](#) (GCC). The GCC is a consortium of higher education and industry partners working to transform university chemistry education and to increase the number of green chemists and scientists.

At a Glance

[UNEX](#) has an extensive range of sustainability-related courses and programs, including sustainable design, energy for sustainability, and environmental monitoring.

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.

Examples of Excellence

David Dornfeld, a professor of mechanical engineering, and Ashok Gadgil, a professor of civil and environmental engineering, were named to the National Academy of Engineering for their work in manufacturing and sustainability (Read [more](#)).

The Energy Biosciences Institute received U.S. Patent No. 8,431,360 titled “Methods and Compositions for Improving Sugar Transport, Mixed Sugar Fermentation, and Production of Biofuels” (Read [more](#)).

The Haas School of Business signed the United Nations’ Principles for Responsible Management Education (UN PRIME). Ron Cohen, a professor of chemistry, won an “Educator Champion of Science” award from the Chabot Space & Science Center.



Photo credit: Rachel Balmy

20. Excerpt from Justin Seiter, California magazine, “[Greening the Commute](#),” Summer 2013.

Spotlight on Sustainability Research

UC Berkeley is consistently rated among the top institutions in the world for the quality and breadth of its research programs, the distinction of its faculty, and the excellence of its Ph.D. programs. Berkeley's strength includes particular expertise in addressing pressing global challenges such as health, energy, and the environment, receiving \$714 million in research contracts and grants in 2011/12.

There are at least 200 faculty engaged in [sustainability research](#) in almost half of the departments on campus. The research is diverse and influential, as these examples from campus publications clearly show.

Warmer climate strongly affects human conflict and violence worldwide, says study

Kathleen Maclay, UC Berkeley Media Relations, August 1, 2013

"Shifts in climate are strongly linked to human violence around the world, and according to a new study by researchers at the University of California, Berkeley and Princeton University, even relatively minor departures from normal temperatures or rainfall can substantially increase the risk of conflict. The study, whose results were published in the journal *Science*, shows the Earth's climate plays a more influential role in human affairs than previously thought."

Campus still a great place for birds despite century of changes

Robert Sanders, UC Berkeley Media Relations, July 23, 2012

"The bird population on the University of California, Berkeley, campus has remained surprisingly diverse over the past 100 years, showing that it's possible to create a green wildlife haven within a dense urban area, researchers say."

With global warming, will iguanas grow as big as Komodo dragons?

Robert Sanders, UC Berkeley Media Relations, June 4, 2013

"Why don't plant-eating lizards like iguanas grow as large as meat-eating lizards, such as the humongous 10-foot-long, 150-pound Komodo dragons? A recent discovery at the University of California, Berkeley, shows that at least some herbivorous lizards did grow that large during a warmer era 40 million years ago. The giant vegetarian lizard, identified from fossil jaw bones in UC Berkeley's Museum of Paleontology, suggests that a warm climate helps these cold-blooded animals grow larger, and that some reptiles may grow larger as global temperatures continue to rise."

More Female Board Directors Add Up to Improved Sustainability Performance

Haas School of Business, November 14, 2012

"As a corporate responsibility consultant, Kellie McElhaney publicly criticized Apple's recent appointment of another man to an already all-male executive team. McElhaney's new

research goes one step further, indicating that the number of women on a corporate board correlates with a firm's sustainability performance."

Some Like It Hot Thermophiles clean up biofuel production

David Hershey, Berkeley Science Review, Fall 2012

"In the hunt for more sustainable biofuels, microbes derived directly from crop environments are heating up the chase. Recent research led by Professor John Taylor at UC Berkeley's Energy Biosciences Institute (EBI) has shown that fungal and yeast strains taken from hot decomposing plant matter will thrive at high temperatures, enabling higher yielding industrial processes for cellulosic ethanol production."

Freecycling has viral effect on community spirit and generosity, study shows

Yasmin Anwar, UC Berkeley Media Relations, May 29, 2012

"Reinforcing that the best things in life are free, a new study from the University of California, Berkeley, shows that online freebie-exchange communities such as "Freecycle" and "Couchsurfing" foster greater team spirit among their members than do cash-for-goods websites. The results, published earlier this month in the journal *Administrative Science Quarterly*, may help explain why a growing number of recession-weary Americans are participating less in monetary-based consumerism in favor of "gift economies" built on freebies and community spirit."

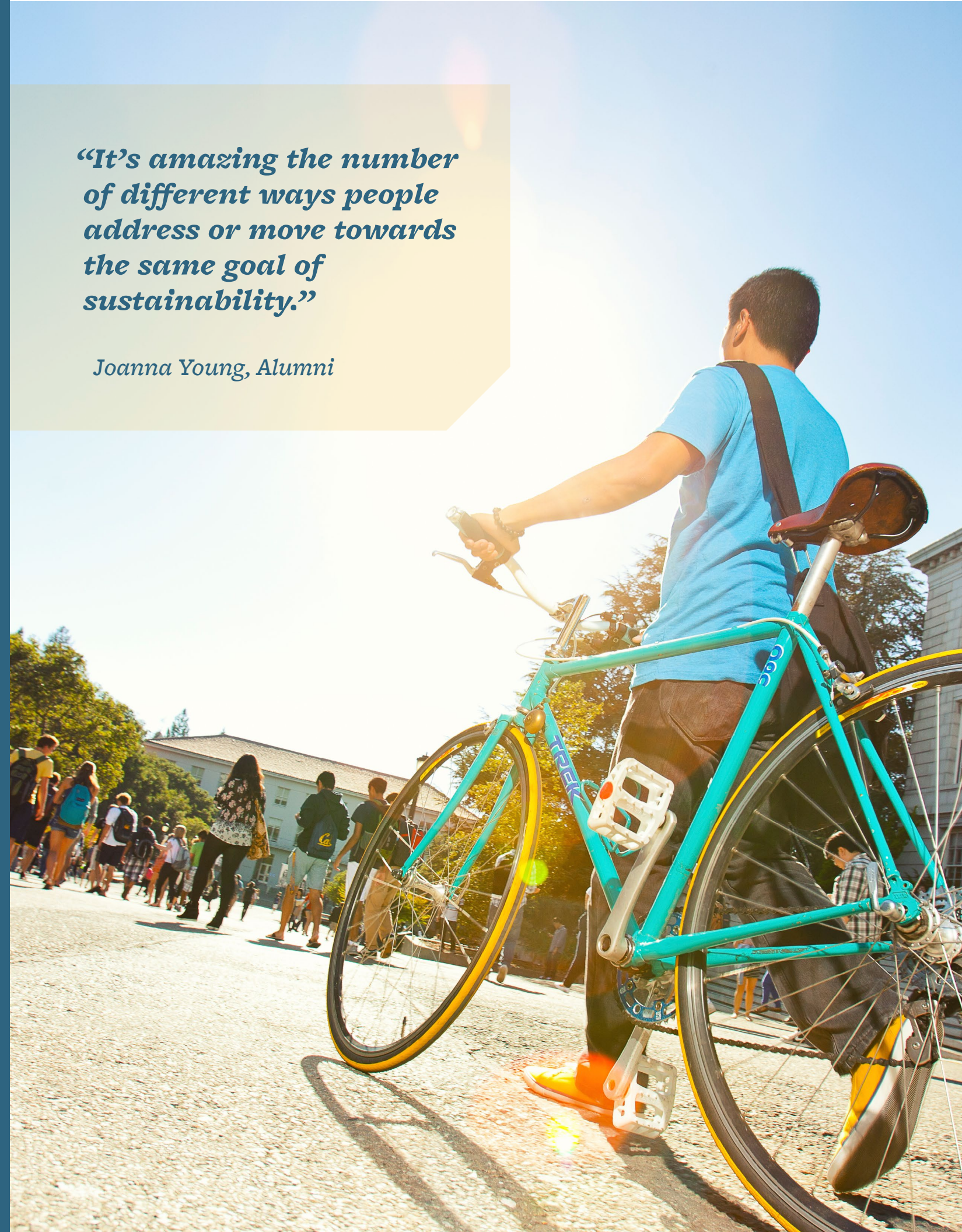
Steelhead trout lose out when water is low in wine country

By Sarah Yang, UC Berkeley Media Relations, May 7, 2012

"The competition between farmers and fish for precious water in California is intensifying in wine country, suggests a new study by biologists at the University of California, Berkeley. The findings, published in the May issue of the journal *Transactions of the American Fisheries Society*, link higher death rates for threatened juvenile steelhead trout with low water levels in the summer and the amount of vineyard acreage upstream."

"It's amazing the number of different ways people address or move towards the same goal of sustainability."

Joanna Young, Alumni



Across Campus

New Green Departments support community of sustainability

While much of the work presented in this Report focuses on specific topics, there is also important work being done campus-wide to help define the culture of sustainability at UC Berkeley. These measures – campus committees and organizations, grants, communication tools, reports, and other similar initiatives – serve to ensure that sustainability is institutionalized on campus.

The Chancellor’s Advisory Committee on Sustainability ([CACS](#)) promotes environmental management and sustainability on campus. Membership includes faculty, staff, students, and alumni. CACS hosts an annual Sustainability Conference, presents annual [Sustainability Awards](#), and funds the Chancellor’s [Green Fund Grants](#) and [internships](#). The [Office of Sustainability](#) communications efforts include the [Bright Green News](#) newsletter, a sustainability tour, Student Sustainability [Forums](#), four websites, and a Facebook [page](#).

In 2009, the campus adopted its [2009 Campus Sustainability Plan](#) to define a vision of long term sustainability and action being taken to achieve the vision. In addition, the University of California “[Policy on Sustainable Practices](#)” (UCOP) outlines the system-wide efforts to minimize environmental impacts and increase usage of renewable energy.

CACS Sustainability Award Winners

Arpad Horvath, UC Berkeley Professor in the Engineering and Project Management Program and in the Energy, Civil Infrastructure and Climate Program in the Department of Civil and Environmental Engineering Not only is Professor Horvath’s research advancing the understanding of climate impacts and engineering and teaching students about cutting edge methods, he has also been a contributor to campus sustainability efforts for the last ten years. Arpad was a founding faculty member on CACS and the Cal Climate Action Partnership (CalCAP). He continues to be a faculty leader in campus sustainability, engaging his students in campus efforts and providing expertise as the campus set its next greenhouse gas emissions target.

Kira Stoll, Sustainability Manager Kira has been a sustainability champion her entire career at Berkeley, first as the campus Transportation Planner and now in the Office of Sustainability. Kira has been an active member of CACS since the beginning and co-chaired the committee in 2011. She is both a big-picture thinker and detail-oriented, contributing to campus-wide initiatives while also producing results and accomplishments day-to-day. Some successes this award recognized her for include co-authoring Berkeley’s first bicycle plan and zero waste plan, managing Berkeley’s climate inventories and reporting, producing the monthly Bright Green News, and mentoring countless students.

Institutionalizing Sustainability

In addition to the Office of Sustainability’s three full-time staff and 8 to 15 student interns, there are campus staff working on energy management, energy efficiency, green buildings, grant coordination, and recycling.

[The Green Initiative Fund](#) (TGIF) is a student fee funded grant program for sustainability projects. In five years, it has awarded over \$1.5 million to 96 different projects, which have resulted in 195 paid student internships.

The campus photo gallery maintained by Public Affairs now has a [sustainability folder](#).

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.

Across Campus: Projects and Initiatives

There are over 40 student groups focused on sustainability, including the [ASUC Sustainability Team](#), [Engineers Without Borders](#), and the [Berkeley Student Food Collective](#).

Number of certified [green departments](#): 15 (New certifications: Procurement Services and Haas School of Business), with 2,100 employees (3,600 including part-time and student employees).

Number of certified [green events](#): 130, with almost 39,000 attendees (as of June 2013); over 35% were student-run events, with 75% offering composting and 61% offering sustainable food.

[Health*Matters](#), the wellness program for faculty and staff, integrates health and sustainability with the Eat Well Berkeley initiative, plans annual events like Food Day and WalkGreen, and develops tools like the Shoppers’ Guide to Pesticides.

There are at least six (6) [Alameda County Green Businesses](#) on campus.

Green Departments

More Departments Going Green



Gerardo Campos, Evin Guy, & Dean Richard Lyons

The Haas School of Business is one of two newly certified [green departments](#). Haas is the third academic partner to complete the process, and is the first department to have students as active members of their Green Team. Their initiatives include having multiple scanners for employees, as well as installing the new recycling signage throughout their building. Impressively, Haas also offers composting in five locations and has installed a hydration station in Cheit Hall, as well as a bottle refilling station in the FIFO Café and staff and faculty lounges. Haas received additional points for hosting other sustainability-related events, like e-waste collection and freecycle events, having a shoreline cleanup event, and a virtual food drive.

Procurement Services

is another new [green department](#) and is the second one in leased space. They certified 15 points for initiatives that include eliminating all CRT monitors, making a scanner available to all employees, offering no bottled water and reusable kitchenware, using green cleaning supplies, and posting ‘turn off the lights’ reminders. They are the first department to achieve the point for using only reused furniture – and they did it after two separate moves. Procurement also received credit for participating in a reusable delivery box program they offer to campus and a “Printer Exchange program” that swapped over 40 old energy inefficient printers for new Energy Star certified ones.



Procurement Green Team members Rosabelle Sylvester, Jennifer Hewick (Morales), Sandy Macasieb, and Roesia Gerstein; Photo by Justin Sullivan

A third department, **Environment, Health, and Safety**, re-certified this year for the second time with 22 points for initiatives that include installing energy efficient window film on office windows, partnering with myPower on an energy survey, installing CFL lamps and distributing task lamps, using rechargeable batteries, no longer using bottled water or CRT monitors, having department watt-meters and a bike fleet, and adding composting.

Economic Sustainability

Foundational role in building California

This is a new section to the Report highlighting economic indicators, to better align our reporting practices with the Global Reporting Initiative guidelines. The section includes data on campus impacts on economic systems and conditions of our stakeholders and our surrounding communities.

Economic Performance

Direct Economic Value The campus reports on its economic performance through multiple documents prepared by the Office of the Chief Financial Officer. The [2011-2012 Financial Report](#) includes highlights and strategies, as well as financial statements and a discussion of operating performance. In fiscal year 2011-12, UC Berkeley had \$1.6 billion in operating revenues, \$400 million in non-operating revenues, and \$2.2 billion in operating expenses.

The campus also prepared the [2013-14 UC Berkeley Budget Plan](#), which is its second all-funds plan and consolidated Berkeley budget. The Executive Summary provides an explanation of the purpose of the Plan and tells the campus budget story:

“The 2013-2014 University of California, Berkeley Budget Plan provides strategic context on our current financial position, progress to date, future plans on our financial strategies (including our current operating budget and capital plan), budget plans for all major control units, and other institutional metrics of interest. This document is intended to continue our discussion about how we can make informed decisions that will support UC Berkeley’s foundational role in building California and remaining a center of innovation, discovery, growth, and sustainability.

“In part, we produce this Plan to illustrate how we are using funding support we receive from students and their families, the state of California and other government entities, donors, and the general public. We want to shift our focus from accountability to the fund to accountability for campus goals and outcomes. This includes improving the student experience by increasing graduation rates, lowering student indebtedness, and supporting the transition to post-graduate activities, such as employment and education.”²¹

Financial Implications Due to Climate Change The Office of Sustainability manages the Cal Climate Action Partnership, which analyzes future energy costs and savings due to projects that reduce our emissions. The analysis also evaluates the risk of future regulatory costs due to California’s [AB32](#) legislation. In addition, the Office is compiling a report on adaptation risks in the Bay area, with an emphasis on campus properties and resources. This report will be used to analyze any additional risks from climate change impacts such as sea level rise or wildfire.

Textbooks Go Digital @ Cal The Cal Student Store now offers the option of purchasing e-textbooks, which allows students to access textbooks on their computers instead of purchasing a physical copy. E-textbooks contain a user-friendly interface with highlighting, a search engine for note taking, and other study oriented strategies to help students engage in the curriculum. Through a partnership with Follett Higher Education Group, the Student Store is building experience with e-textbooks and helping to chart a course for the near and long-term future of digital learning. In general, e-textbooks cost 40-60% less than purchasing actual textbooks.

In addition, [Educational Technology Services](#) is providing free access to McGraw-Hill electronic textbooks through Courseload, an e-reader web browser. For Berkeley instructors and students, the e-reader has been integrated with bSpace so students can access their texts from the course sites of participating classes. Departments and programs that participated in the pilot last fall include Business (Haas UGBA), College Writing, Engineering, WEMBA (Haas), History, Mathematics, Statistics.

21. [2013-14 UC Berkeley Budget Plan](#), Executive Summary, September 5, 2013.

Indirect Economic Impacts

A discussion of the impacts of the campus should also include the positive economic impacts that flow from the teaching, research, and public service mission. While difficult to quantify, these indirect benefits show the economic influence of the campus locally, nationally, and internationally. As a public institution, UC Berkeley reports on some of these benefits and helps paint a picture of the how the campus more indirectly benefits the economy.

Teaching Students choose UC Berkeley in part because of the diversity of the campus, and the access to higher education by a broad range of students is one source of indirect economic impacts:

- 25.1% are first generation college student with neither parent having a four-year college degree (Fall 2010)²²
- 66% have at least one parent born outside the U.S (2009)²³
- 31% reported that their annual household income was less than \$50,000²⁴ (2012)
- 38% of Berkeley undergraduates received a Pell Grant (compared to 17% for the Ivy League as a whole)²⁵ (2012)

Research An important part of UC Berkeley’s research mission is to ensure that the public benefits from our research through developing practical applications of our research results. There are 135 start-up companies that were founded to commercialize UC Berkeley patent rights. As of June 2012, Berkeley owned:

- 2,493 total active inventions
- 302 active license agreements
- 641 active U.S. patents
- 503 active foreign patents

Examples of these research results include the development of an electrical precipitation device that reduces smokestack emissions²⁶ to the creation of the more efficient wood-burning Berkeley-Darfur stove²⁷. UC Berkeley also attracts some of the best graduate students in the world: 48 out of the University’s 52 Ph.D programs ranked in the top 10, and 1,333 National Science Foundation graduate research fellowships awarded from 2000–10, more than any other school²⁸.

Public Service and Beyond The UC Berkeley Public Service Center “partnered with the community, student leaders, and faculty to engage over 6,000 students in 290,000 hours of service as volunteers, and through jobs, internships, and courses²⁹.” Over 3,500 UC Berkeley graduates have enlisted in the Peace Corps, more than any other university³⁰.

In addition, a study done in 2007 documents the economic and quality of life impacts of the campus for Bay area residents. While some of the data are out of date, some key findings include:

- 71 percent of campus revenues came from outside the Bay area
- Berkeley students spent almost \$400 million in the Bay area
- The direct spending by campus (\$1 billion) generated another \$464 million in spending and an additional 9,200 jobs for Bay area
- There are approximately 1 million visitors to campus each year, contributing at least \$30 million annually to the local economy³¹

Reducing Climate Impacts in the City of Berkeley The Berkeley Climate Action Coalition is a group of local non-profits, educational institutions, businesses, faith-based organizations, public health organizations, neighborhood groups, government agencies, and committed individuals, all working to implement the Berkeley Climate Action Plan. Now entering its second year, the Coalition is launching a series of initiatives and working groups to reduce the climate impacts in areas of transportation, energy and water use, waste disposal, and more. UC Berkeley is part of the Coalition’s Steering Committee and has worked with the Multi-Family Housing Working Group , which is piloting a coordinated package of free (or low cost) services to apartments that will save water and energy, and help reduce solid waste. The many UCB students, faculty and staff living in these multi-family residences are expected to benefit from these services.

22, 23. <http://www.berkeley.edu/about/fact.shtml> 24, 25. <http://opa.berkeley.edu/AnalysesReports/Fall2012SnapshotBerkeleyUndergraduates.pdf>
26. <http://www.berkeley.edu/about/hist/timeline.shtml> 27. <http://gadgilab.berkeley.edu/kqed-quest-report-berkeleydarfur-stove/> 28. Research in Numbers 2011-2012, <http://vcresearch.berkeley.edu/berkeley-research-numbers> 29. <http://publicservice.berkeley.edu/about> 30. <http://publicservice.berkeley.edu/peacecorps/history> 31. “New economic, social benefits report highlights campus impacts,” Kathleen Maclay, Media Relations, September 13, 2007, http://berkeley.edu/news/media/releases/2007/09/13_EconomicImpact.shtml



“It means educating and engaging the campus community in sustainable behavior change and being innovative and purposeful with our campus sustainability projects.”

Katherine Walsh, Staff

Social Sustainability

Staff and students matter

This is a second new section to the Report highlighting social sustainability indicators, to also align our reporting practices with the Global Reporting Initiative guidelines. Included are data on social sustainability issues like worker safety, diversity, and employment.

Occupational, Health, and Safety

UC Berkeley has multiple programs in place to address employee and student health and well-being. The UC Berkeley Office of Environment, Health, & Safety (EH&S) provides guidance and services to the campus community that promote health, safety, and environmental stewardship. In the past year, this guidance has included reducing lab and shop safety deficiencies, creating a new online hazardous waste program, spill response, fire evacuation drills, and food safety and other inspections³².

University Health Services (UHS) provides programs such as Health*Matter wellness program, with a vision of “a healthy campus community that is an inspiring place to learn, work and live.” This and other UHS Faculty and Staff Health Programs provide the campus with services to help faculty and staff live healthy and balanced lives. This is accomplished by providing services such as employee assistance, disability assistance, ergonomics, health and wellness, work-related medical treatment and work/life services.

Worker safety is an important part of the work of both EH&S and UHS. Disability Management Services (part of University Health Services) administers the workers’ compensation program and facilitates return-to-work initiatives and reasonable accommodation for employees who have, or who may develop health problems (work-related or non work-related) affecting employment. The summary of recordable injuries and illnesses is reported annually and is available online,³³ and reports 447 recordable injuries and illnesses in 2012. In addition, EH&S works in close partnership with other units to reduce workers’ compensation costs by identifying and addressing workplace hazards³⁴.

WorkFIT Works [WorkFIT](#) is an in-house fitness program, sponsored by UC Berkeley’s Department of Recreational Sports, aimed at improving the health and wellness of faculty and staff by providing strength, flexibility, and general fitness training. The key to this program is providing certified trainers, at a specific work location, whereby faculty and staff are able to conveniently schedule fitness into their workday. This training can be tailored to fit departmental or group needs and will leave participants refreshed, energized, and productive.

Training and Education

UC Berkeley offers a wide range of training and educational opportunities for staff to improve their knowledge and skills. Examples include the [Leadership Development Program](#), [on-line computer software classes](#), and [sexual harassment prevention training](#). The [Human Resources](#) department catalogs a range of offerings on their website, and some departments offer additional training beyond these. It is not, however, currently possible at this time to capture all training being done across campus or to provide the average time spent in training.

Learning + Organizational Development (L+OD, formerly COrWE) works with campus leaders and managers who are seeking to make organizational improvements. L+OD also supports the development of the workforce through learning and development programs aligned with organizational initiatives. The offerings include organizational consulting, sponsorship of professional networks for communities of practice, and sponsored tuition for select courses at UCB Extension.

The campus also offers a range of online classes to staff. The resources include E-Learn, which is a set of online learning options available to staff from work or home. Some of the components offered on this site are e-learning courses on business and IT topics, reference books, job aids, preparation for some certification programs, and career development resources. The UC Learning Center provides a portal to workplace learning where UCB staff can enroll in campus-sponsored classes, take an e-course, read e-books, or create an individual learning plan. Finally, Calpact offers computer training for UCB staff to learn new skills, enhance productivity and increase career mobility on campus.

Professional development is also part of the employee evaluation process, where a Professional Development Plan is a formal part of non-represented staff evaluation forms. The elements of these plans are often opportunities offered outside of the university, such as external training or conferences.

Staff Sustainability Training The Office of Sustainability has offered staff sustainability training - **WORKbright green** – for two straight years. Forty campus staff have attended the free eight hour sessions on simple and feasible ways to reduce the environmental impacts of their work. The staff represented a range of departments and job roles, from student affairs officers to administrative assistants to custodial supervisors. The training equipped staff with tools to make informed choices to improve sustainability in the workplace, bring green projects back to the office, and collaborate with other campus sustainability stewards.

New Program: Berkeley Catalysts The campus recently launched a new Berkeley Catalysts program. This action-learning program offers a unique professional development opportunity for promising campus staff from units across campus. Catalysts will attend nine learning labs aimed at honing their leadership and organizational improvement skills in service of excellence in administration and operations, followed by three months of coaching and implementation. The Catalysts partner with unit leaders to focus on a strategic opportunity or challenge for the unit; catalysts might, for example, help unit meetings to run more effectively, increase employee engagement, make appreciation “go viral,” or streamline processes.

32. Office of Environment, Health, & Safety 2011-12 Annual Report, <http://ehs.berkeley.edu/images/ehs/misc/EH&S20112AnnualReport.pdf> 33. <http://uhs.berkeley.edu/facstaff/dms/pdf/OSHA%20Annual%20Summary%202012.pdf> 34. Office of Environment, Health, & Safety 2011-12 Annual Report, page 4

Diversity and Equal Opportunity

What do we mean when we speak of diversity and inclusion at the University of California, Berkeley? Diversity and inclusion as a concept focuses on a broader set of qualities than race and gender. In the context of the workplace, valuing diversity means creating a workplace that respects and includes differences, recognizing the unique contributions that individuals with many types of differences can make, and creating a work environment that maximizes the potential of all employees.

In Human Resources, the [Staff Equal Employment Opportunity \(EEO\) Compliance](#) office creates and maintains the campus’s [affirmative action plan](#). The unit gathers and analyzes [workforce and personnel transaction data](#), sets [affirmative action goals](#), and monitors affirmative action and diversity efforts.

The Vice Chancellor for Equity and Inclusion is charged with implementing the campus Strategic Plan for Diversity, Equity, and Inclusion ([Pathway To Excellence 2009](#)). In addition, the campus maintains a [diversity website](#) which compiles information on the work of the Vice Chancellor for Equity and Inclusion, the Campus Climate Survey, the Berkeley Principles of Community, and other related efforts, including academic initiatives and related resources.

UC Berkeley also widely reports on our diversity. Data from our campus is included in an annual statistical summary of staff from the University of California (see table). The campus reports the demographic shares of different campus populations (by gender and race/ethnicity) at various stages in joining the UC Berkeley community on the [Equity, Inclusion and Diversity: Data Dashboard](#).

| Personnel Headcount by Ethnicity, Personnel Program, Gender, and Age Group | | | |
|--|--------|--------|--------|
| | Female | Male | Total |
| American Indian | 69 | 30 | 89 |
| Asian | 2,823 | 2,299 | 5,122 |
| African American | 714 | 464 | 1,178 |
| Hispanic | 1,214 | 875 | 2,089 |
| White | 4,446 | 4,847 | 9,293 |
| Unknown/not stated | 2,028 | 2,010 | 4,038 |
| | | | |
| Campus Total | 11,284 | 10,525 | 21,809 |
| Unclassified | 83 | 66 | 149 |
| Academic | 3,666 | 5,375 | 9,041 |
| Non-academic | 7,535 | 5,084 | 12,619 |

| Headcount by Age Group, % | |
|---------------------------|-------|
| Under 30 years | 26.6% |
| 30-50 years | 39.6% |
| Over 50 years | 33.7% |

The University of California is formally governed by The Regents, a 26-member board, as established under Article IX, Section 9 of the California Constitution. The membership of the Regents (including ex officio members and faculty representatives and staff advisors) is publicly reported, but no statistics on diversity categories are compiled.

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Social Justice Over Spring Break This year, the [Alternative Breaks](#) program offered a wide range of service-learning opportunities, including two in the Bay area: [Environmental Justice: Examining Health, Building Community, Demanding Equity](#) and [Food for Thought: Food Justice & Sustainability](#).

Student Satisfaction

The campus regularly surveys students through the [UC Undergrad Experience Survey](#). The survey is administered in the spring to the entire population of students. Every student is asked a common set of questions about academic engagement and demographics, followed by a randomly assigned module on a subset of the remaining survey topics. The response rate for the spring of 2012 was 33%, although 39% of respondents answered at some of the questions.

Key findings include:

- 85% agree (somewhat agree, agree, or strongly agree) that “Berkeley has a strong commitment to undergraduate education”
- 55% agree (somewhat agree, agree, or strongly agree) that “The emphasis on research detracts from the quality of teaching on this campus”
- 71% are satisfied (somewhat satisfied, satisfied, or very satisfied) with the “value of your education for the price you’re paying”
- 87% agree (somewhat agree, agree, or strongly agree) with the statement “Knowing what I know now, I would still choose to enroll at this campus”

The campus also surveys [alumni](#) and graduate students, although no results for the latter are available beyond [2010](#).



“Engaging through providing services within the community where people can collaborate on their efforts is the most treasurable and meaningful accomplishment and it really helps me understand the significance of such actions.”

Zara Fernandez, student

Annual Sustainability Metrics: 1990-2012

| | 1990 | 1995 | 2000 | 2010 | 2011 | 2012 |
|--|---------------|---------------|---------------|-----------------|--------------------|--------------------|
| Energy & Climate | | | | | | |
| Total greenhouse gases (metric tons CO ₂ eq.) | 148,586 | 153,296 | 181,828 | 164,815 | 146,769 | 138,447 |
| - GHG Scope 1 | 10,116 | 10,850 | 10,582 | 12,305 | 12,899 | 12,692 |
| - GHG Scope 2 | 88,960 | 93,982 | 124,201 | 109,967 | 99,261 | 92,150 |
| - GHG Scope 3 | 49,509 | 48,465 | 47,046 | 42,543 | 34,609 | 33,830 |
| Electricity (kWh) | 156,793,403 | 174,820,676 | 188,778,537 | 215,307,772 | 212,878,439 | 217,366,655 |
| Steam (MMBtu) | 968,246 | 975,972 | 983,760 | 1,061,669 | 1,084,036 | 1,034,039 |
| Natural gas (MMBtu) | 152,230 | 165,425 | 159,597 | 202,515 | 212,365 | 208,034 |
| Total energy (G joules) | 1,747,533 | 1,834,522 | 1,886,776 | 2,109,922 | 2,135,193 | 2,093,987 |
| Renewable energy | | | | 100 kW | 100 kW | 100 kW |
| Renewable energy certificates (metric tons CO ₂) | | | | 396 | 205 | 0 |
| Water | | | | | | |
| Water (millions of gallons) | 739.3 | 744.8 | 698.7 | 624.7 | 602.1 | 616.3 |
| Wastewater (millions of gallons) | 546.7 | 512.2 | 473.9 | 452.8 | 421.5 | 431.4 |
| Built Environment | | | | | | |
| LEED™ buildings (#/square footage) | | | | 7 (807,968 ft²) | 10 (1,112,861 ft²) | 10 (1,112,861 ft²) |
| Waste | | | | | | |
| Solid waste (short tons) | | 6,414 | 6,385 | 5,001 | 4,815 | 4,622 |
| Diverted waste (short tons) | | 1,705 | 3,157 | 10,123 | 6,192 | 7,587 |
| - Recycled waste | | 1,705 | 2,374 | 1,958 | 2,127 | 1,832 |
| - Construction waste | | | | 6,835 | 2,175 | 4,216 |
| - Reusables | | | | 4 | 214 | 231 |
| - Composting | | | 783 | 1,326 | 1,675 | 1,308 |
| Diversion rate (%) | | 21% | 33% | 41%/67% | 46%/56% | 62%/42% |
| Hazardous Waste (tons) | | 801 | 341 | 170 | 280 | 184 |
| Procurement | | | | | | |
| Total green purchasing (\$) | | \$1.5 million | \$9.1 million | \$11.8 million | \$14.4 million | |
| Recycled paper purchases (% of total copy, fine, and computer paper purchases) | | 64% | 77% | 76% | 71% | |
| Transportation | | | | | | |
| Fuel usage – commute and fleet (gal) | 3,192,039 | 3,062,652 | 2,858,872 | 2,105,971 | 1,393,017 | 1,384,664 |
| Vehicle miles traveled – commute | 59,216,106 | 58,170,774 | 54,990,752 | 43,176,842 | 29,015,593 | 29,346,122 |
| Vehicle miles traveled – fleet | | | | 1,864,609 | 2,095,665 | 1,998,994 |
| Green fleet (%) | | | | 17.9% | 22.0% | 22.9% |
| Air travel (miles) | | | | 122,942,318 | 112,500,176 | 112,320,124 |
| Food | | | | | | |
| Total sustainable purchases (%) | | | | 25%/32% | 24%/33% | 28%/38% |
| Other | | | | | | |
| Population | 44,120 | 43,509 | 45,565 | 50,085 | 50,334 | 50,511 |
| Gross Square footage | 12,817,517 | 13,520,471 | 14,145,728 | 15,941,137 | 16,127,722 | 16,862,738 |
| Research | \$309,755,000 | \$333,613,000 | \$415,408,000 | \$524,733,000 | \$518,376,000 | \$500,879,000 |

Annual Sustainability Metrics: Sources and Changes from Previous Reports

Data from 2012 CalCAP inventory (November 14, 2013 version) unless otherwise noted (<http://calcap.berkeley.edu>). More information on changes to previously reported data in Energy & Climate and Transportation sections: <http://sustainability.berkeley.edu/calcap/pages/inventory/index.shtml> Most waste data is from Campus Recycling & Refuse Services. Data are calendar year unless otherwise noted; if fiscal year, data reported in the start-ing year of the fiscal year (e.g., FY 2008-2009 is reported as 2008).

Greenhouse gases: “Total greenhouse gas emissions” (the basis for the campus reduction goal) includes Scope 1,2,&3 emissions. Data for 2011 now reflect more accurate estimates of faculty, staff, and student commute.

Natural gas: 2011 data have also been corrected for a small double-counting error.

Renewable energy: Onsite renewable energy represents a photovoltaic installation on the Student Union. The solar thermal installation at the Maximino Martinez Commons is not included because the campus does not retain the environmental attributes. Renewable energy certificates: Credits purchased from third party to offset electricity emissions.

LEED™ buildings: Gross square footage for certified building projects from Judy Chess, personal communications, July 16, 2012 and July 25, 2013. 2011 updated to include one additional building.

Water: Approximately 24,000 gallons of rainwater are reused each year for irrigation at the Boalt Law School.

Solid waste: 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. 2011 data updated to include additional data received after publication date last year.

Diverted waste: Includes recycled, reused, and source-reduced waste, construction waste, and composting. 2011 data updated to include additional data received after publication date last year.

Recycled waste: 2011 data updated to include additional data received after publication date last year.

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.

Reusables: Newly reported data. Included in “Recycled waste” in previous years’ reports.

Diversion rate: The higher number is the percentage of all MSW that was diverted from a landfill; the lower number excludes construction waste.

Hazardous waste: Variations in hazardous waste due to construction projects, especially demolishing buildings containing asbestos and lead. Source: EH&S hazardous waste database.

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

Recycled paper: Data from major office suppliers. All data are based on cost, for paper with a 30% or higher post-consumer recycled content. 2010 and 2011 data updated to consistent timeframe.

Fuel usage: Includes gasoline for commutes; includes gasoline, diesel, E85, and biodiesel for fleet. Data for 2011 now reflect more accurate estimates of faculty, staff, and student commute.

Vehicle miles traveled – commute: Data for 2011 now reflect more accurate estimates of faculty, staff, and student commute.

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

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 2011-2012 from Cal Dining and additional campus foodservice vendors. For 2010-2012: 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: 2010-2012: FacilitiesLink, <https://berkeley.digicality.com>

Research: Research dollar expenditures, in constant 2009 dollars (converted using CPI). Data are fiscal year; 2012 data are preliminary. 2011 data updated to reflect adjustments made after publication last year. Source: Personal communications and Controller’s Office, Schedule 1-B <http://www.ucop.edu/financial-accounting/financial-reports/campus-financial-schedules/>

Campus Grants

The Green Initiative Fund (TGIF) 2012 Summary

TGIF started a new mini-grant program that proved highly successful. Of 42 mini-grant applications, TGIF selected [twelve projects](#), awarding a total of \$17,525. Five projects were second phases or additional plans for existing TGIF projects, while seven were new projects. As of July 2013, four mini-grant projects were completed, with the remaining eight slated to complete by mid-December 2013. Due to the success of the inaugural mini-grant program, it will now be a permanent grant cycle offered annually by TGIF.

TGIF also awarded a total of \$278,505 to [fourteen projects](#) through the regular application process. For the first time, habitat restoration dominated as the project theme, with five such projects selected. With the announcement of the 2013 TGIF Spring Grant Awards, TGIF has now awarded over \$1.5 million to 96 projects and funded 195 student internships in six years of grant cycles. In total, 53 grant projects have been successfully completed.

2012 Green Fund Grant Recipients

The Chancellor’s Advisory Committee on Sustainability awarded four Green Fund grants in April 2013:

“Spring Cleaning in Campus Closets” This project will improve the utilization of space on campus through a “Campus Sustainable Cleanup” effort. This outreach program will help departments free up underutilized space and repurpose it by coordinating the recycling and reuse of un-used materials that are taking up space.

“Sigma Pi L.E.D.’s the Way to Energy Savings” This initiative will reduce water and electricity use in the fraternity house by installing energy-efficient devices and materials. Sigma Pi aims to reduce water consumption by 15% and will install over 30 LED lightbulbs and insulation in their basement.

“Swag’ Bags for Bicyclists” This program will provide sustainable promotional and safety items to hundreds of cyclists at the two campus Energizer Stations during this year’s Bay Area-wide Bike-to-Work Day on May 9th.

“Fitting Plant to Place: Site-Specific Restoration Planning on Strawberry Creek” This grant will fund the work of two undergraduate students to perform site preparation, collect planting data, acquire native plants from local nurseries, and propagate plants in the Strawberry Creek Native Plant Nursery as part of the campus effort to restore the watershed.

Chancellor’s Community Partnership Fund

Established by Chancellor Robert Birgeneau in 2006, the UC Berkeley Chancellor’s Community Partnership Fund (the Fund) supports projects and programs that establish, extend and strengthen collaborative partnerships between UC Berkeley and the wider Berkeley community. The Fund seeks to enhance the quality of life for people who live and work in Berkeley by providing grant funding to neighborhood improvement projects and community service programs that link the university’s energy and resources with those of the community. [2011-2012 Partnership Grant Awards](#)

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.

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About the Office of Sustainability

The UC Berkeley [Office of Sustainability](#) provides leadership to campus by setting ambitious sustainability goals and strategies and by accelerating the achievement of these goals through project implementation, planning, partnerships, and community engagement. Our mission is to integrate cutting-edge sustainability practices into our operations, foster the culture of sustainability at home and in the world, and enable and improve excellence in sustainability. We work to achieve climate neutrality and strive for excellence in breadth and depth by implementing bright green initiatives to reduce our ecological footprint, raising awareness and reducing energy use with our Talking Louder and myPower campaigns, and emphasizing transparency and accountability through our plans and reports.



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**.

