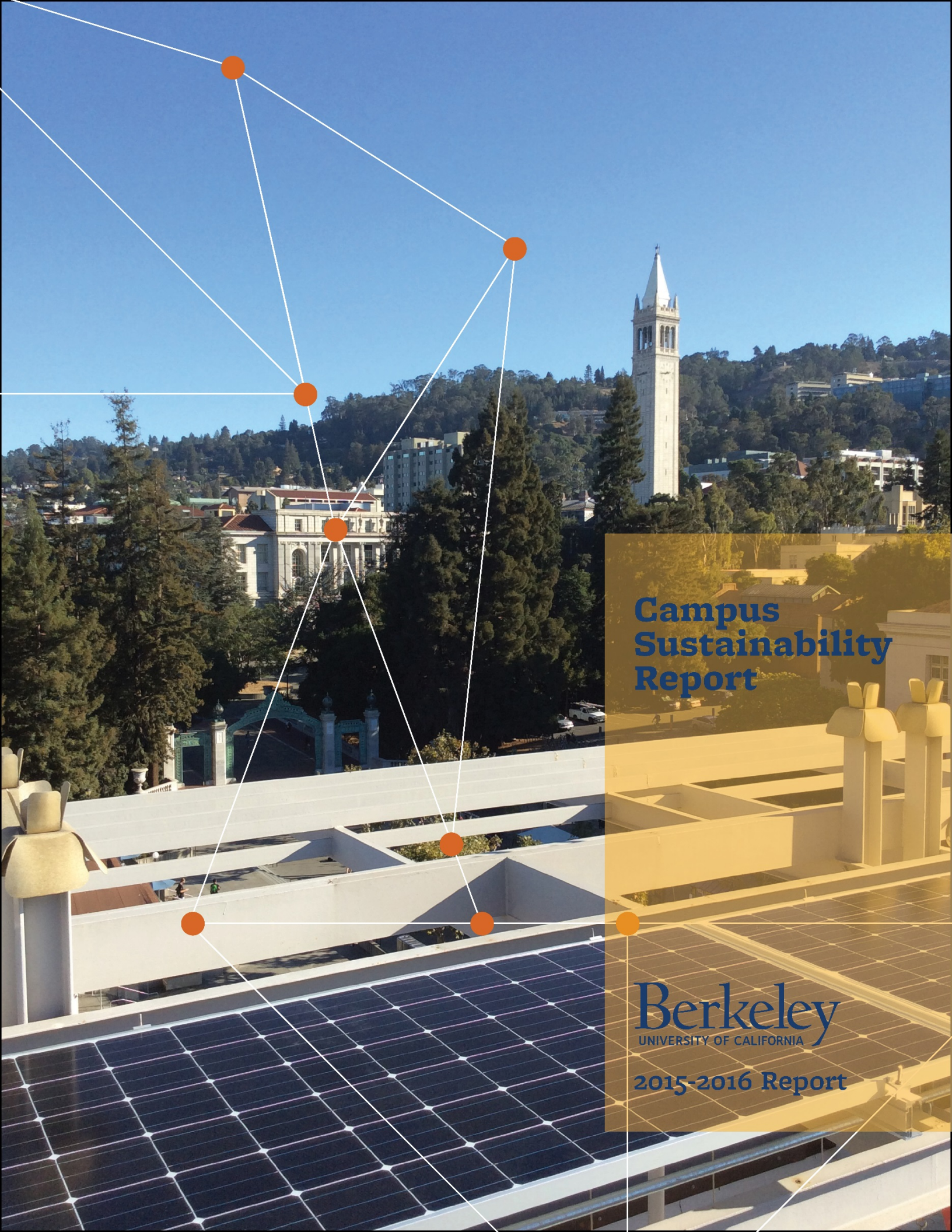
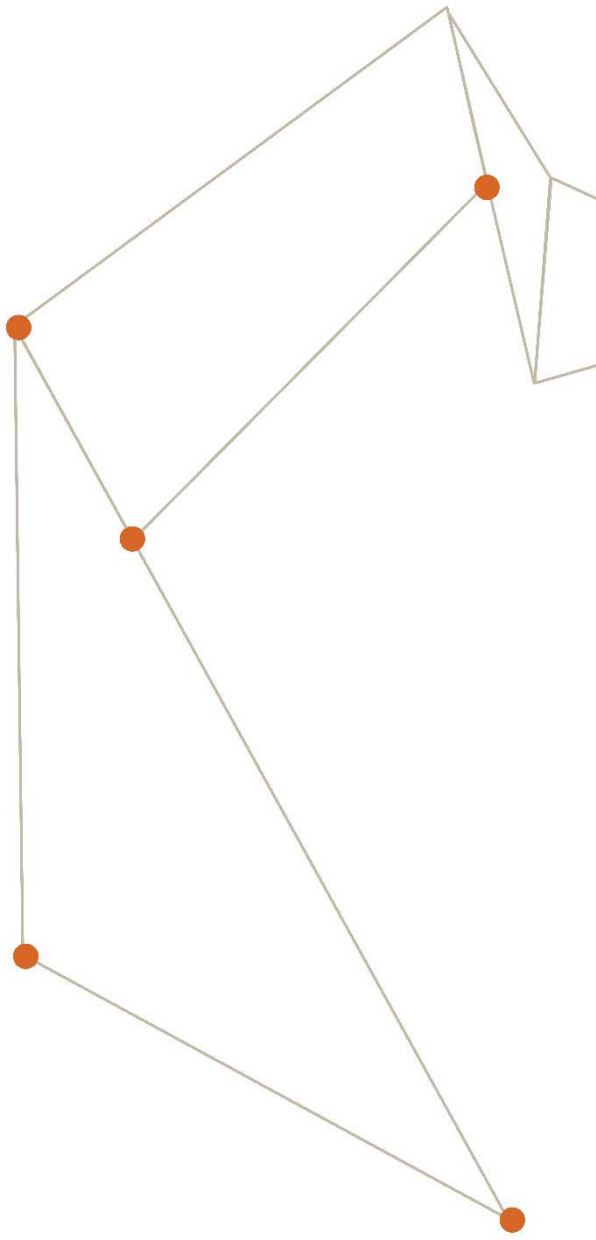


Campus Sustainability Report

Berkeley
UNIVERSITY OF CALIFORNIA

2015-2016 Report



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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. Total operating revenues in FY14-15 were $1.8 billion,[1] while total research expenditures were $572 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.

Cover photo credit: Kira Stoll

[1] http://controller.berkeley.edu/sites/default/files/2014-15_financial.pdf

Introduction

It is important to regularly take a step back and reflect on successes and lessons learned, and to look forward to the challenges and opportunities that lie ahead. Sharing these reflections invites others to celebrate and plan with you – which is a primary goal of this sustainability report for the UC Berkeley campus.

With this report – the eighth in the series – the campus provides transparency through on-going diligence on data accuracy, while streamlining the reporting to better focus on the most material aspects of our work. It covers two academic years, with the hope that it continues to provide value to our stakeholders.

The last two years saw the campus hit interesting milestones:

- Solar PV systems at MLK Student Union, the new Eshleman, the Recreation Sports complex, and the University Village apartments are now generating 1 MW of power from the sun.

- 1,750 faculty, staff and students joined the Cool Campus Challenge, pledging actions that will reduce 1,021,720 million of pounds of carbon emissions each year.

- In April 2016, The Green Initiative Fund was renewed for an additional 10 years by a 68% 'yes' vote. Since its inaugural grant cycle in spring 2008, TGIF has awarded more than $2 million in grants to 160 projects.

- The University of California sold its remaining direct holdings in coal-mining and oil-sands-focused companies, as part of a new risk-review process that more comprehensively considers environmental sustainability, social responsibility and governance risks in our investment strategy.

- There are around 50 registered student environmental groups.

- The campus won the 2015 and 2016 PAC-12 Zero Waste Challenges, as well as the Recyclemania title for four straight years.

- The campus won two Best Practice Awards at both the 2015 and 2016 California Higher Education Sustainability Conference: for a student group's LED Microscope Retrofits Project, for the new local sourcing concept at brown's restaurant and best design awards for New Campbell Hall and Jacobs Hall.

- Three new faculty chairs have been established within the Engineering department to create better technology, policy, and products to address global energy and sustainability challenges. In addition, the campus added a minor in food systems, which explores the role of food within the environment and society.

- Three College of Natural Resources faculty are engaged in system-wide efforts to reduce emissions - our first climate action champion and to lead the Berkeley effort to better understand and grow our climate related curriculum.

Other Fun Facts

- 29% of undergraduates took at least one course focused on sustainability in 2013–14
- During their regular commute, faculty, staff, and students walk around 9.6 million miles per year and bike 10.1 million miles per year
- Since 1975, Berkeley has reduced water use by one-third

Lisa McNeilly
Director of Sustainability and Energy

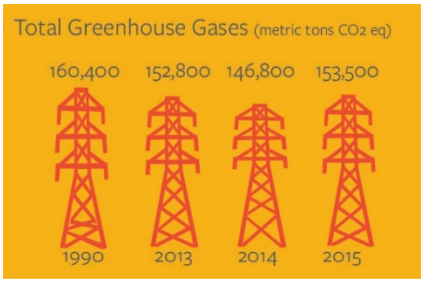
Overall Performance

Energy and Climate

Carbon neutrality goal implementation started

Goal: By 2014, reduce greenhouse gas emissions to 1990 levels. *Achieved.*
Achieve climate neutrality from building and fleet use by 2025. *On track.*

Campus **greenhouse gas emissions** have remained fairly stable over the last three years and **are 4% below 1990 levels**. Steam use has dropped for the fourth straight year, and electricity use has decreased since 2012 by over 4 million kWh. Interestingly, the 2014 electricity emissions factor from PG&E increased, perhaps due to the drought and hydropower production.

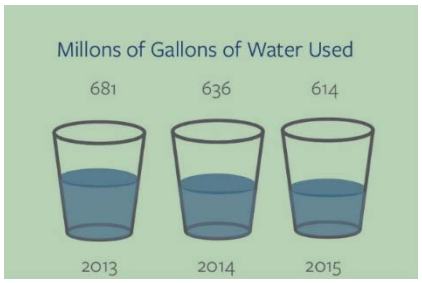


Water

Use down 10% since drought

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

In total the **campus currently uses 614 million gallons of water, which is almost 20% less than in 2008 – meaning the campus goal has been met twice over**. Use is estimated to be down 10% since the drought declaration.



Built Environment

More award-winning buildings

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 **fifteen (15) LEED™ certified building projects, representing over 10% of total square footage**.

Waste

Diversion rate rises, driven by composting

Goal: Achieve a 75% diversion rate by June 2012 and zero waste by 2020. *On track.*

The campus **diversion rate has increased to 54%**, with the amount of municipal solid waste being sent to landfill again dropping (down 2%). The landfill tonnage is down by a third since 1995. The data also reveals the success of campus efforts to expand the composting program, as the campus now diverts almost 40% more than just two years ago.

Procurement

Data challenges continue

Goal: Comply with the University of California environmentally-preferable purchasing policies and procedures. *On track.*

Collecting complete and accurate data on the purchases of sustainable products remains problematic. One area of success is the **continued increase in purchases of recycled content copy paper** – up 17 percentage points in two years. BearBuy users now have the option to purchase 100% recycled content paper for less than 30% content.

Food

Focus on local purchases

Goal: By 2020, increase sustainable food purchases by campus foodservice providers to at least 20%. *On track.*

Making foodservice operations more sustainable visibly improves the overall campus purchasing and waste performance. Vendors continue to **increase** the **percentage of their purchases of sustainable food, reaching 30% in 2015**.

Transportation

Improvements for bicyclists

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

Campus fuel use – from fleet and commute – **remains over 25% below 1990 levels**. The most recent triennial transportation survey of faculty, staff, and students showed a continued decline in drive alone rates, with more people opting to use public transit for their commutes.

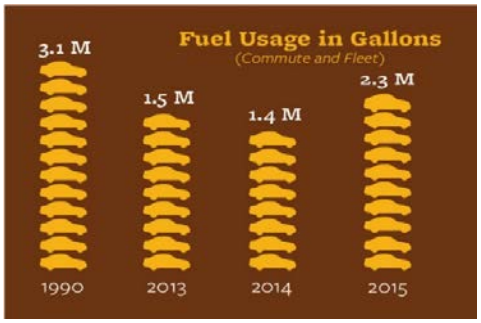


Photo Credit: Public Affairs

Environmental Sustainability

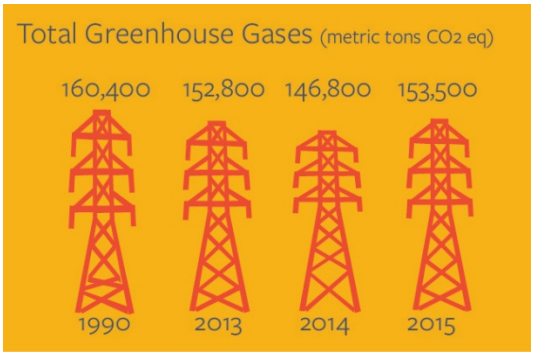
Berkeley has achieved or is on track to achieve the majority of its environmental goals. Greenhouse gas emissions continue to drop, while purchases of sustainable food increase. Waste sent to landfills per capita has dropped over 15% in the last four years, as the campus continues to work on increasing the overall diversion rate. Water consumption is down 20% relative to our baseline, and the campus has added one LEED building.

Energy and Climate

Carbon neutrality goal implementation started

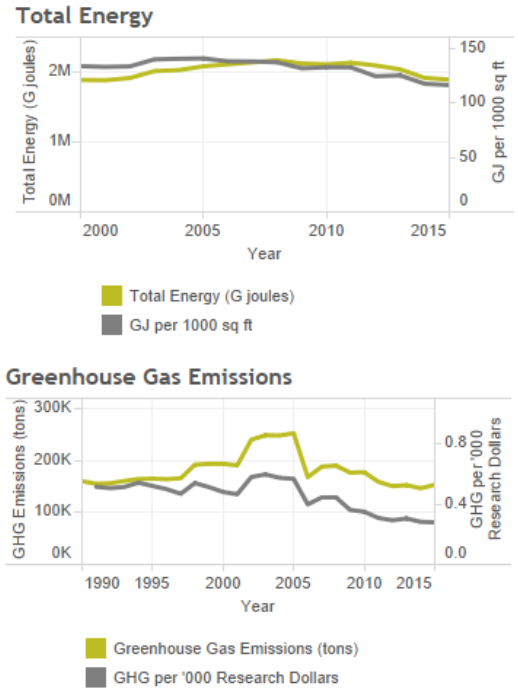
Goal: By 2014, reduce greenhouse gas emissions to 1990 levels. *Achieved.*
Achieve climate neutrality from building and fleet use by 2025. *On track.*

Campus **greenhouse gas emissions** have remained fairly stable over the last three years and **are 4% below 1990 levels**. Steam use has dropped for the fourth straight year, likely due to efficiency measures at the plant and reduced steam demands during the warmer/dryer winters (see Graph 1). The campus now uses a higher California Air Resources Board emissions factor for our purchased steam, to better align with cap and trade reporting. Electricity use has also decreased since 2012 by over 4 million kWh, resulting from energy efficiency efforts. Interestingly, the 2014 electricity emissions factor from PG&E increased, perhaps due to the drought and hydropower production. Campus emissions details can be found on the CalCAP website.



GHG Emissions Profile Berkeley annually inventories ten greenhouse gas emissions sources. Emissions are reported to The Climate Registry and are third-party verified. The top three emissions sources are steam (33%), electricity (31%), and air travel (17%).

Solar photovoltaic installations at MKL Student Union, Eshleman, Recreation Sports, and University Village became operational in 2016. Through a collaborative, competitive procurement strategy with 18 other public agencies in the region, led by the Alameda County General Services division, Berkeley secured very favorable pricing for these three rooftop and one canopy installations. The **systems will produce almost 1MW of power**. Learn more about the regional renewable energy procurement program.



Graph 1: Total Energy and Greenhouse Gas Emissions

Berkeley made a strategic decision in 2014 to voluntarily opt into the state **Cap and Trade program** in order to secure the transition allowances being provided to UC campuses. The transition allowances for Berkeley are for years 2015 through 2020 and are for both stationary combustion sources and the thermal output purchases for steam. Environment, Health & Safety is managing the annual regulatory reporting to the California Air Resources Board.

Student engagement in CalCAP Graduate student PeiDa Kuo prepared a report examining the life-cycle environmental impacts of building new renewable energy facilities for community choice aggregation in comparison to electricity through PG&E.

Undergraduate student Pascal Polonik prepared a report on climate change adaptation and resiliency in the Bay area and an education presentation on climate science and local impacts.

The mission of the newly **founded Climate Readiness Institute** (CRI) is to develop the cutting-edge climate science, adaptation strategies, and mitigation tools needed to ensure a resilient, low carbon Bay Area and beyond. The CRI brings together academics and practitioners to identify critical information gaps and policy challenges related to climate change, conduct scientific analyses of current and proposed adaptation strategies, and assess new mitigation strategies for reducing greenhouse gas emissions.

Student Group Wins Sustainability Best Practice Awards The PowerSave Campus student group was honored for its LED Microscope Retrofits Project (funded by a 2014 TGIF grant), which replaced metal halide lamps in the Molecular Imaging Center with more efficient LED-powered lamps. Read more.

UC Berkeley Enters Partnership With Oakland-Based Sungevity UC Berkeley has selected Sungevity, Inc., a leading global solar service, as its official solar energy partner for the next decade. One part of the 10-year agreement involved Sungevity working with UC Berkeley students across academic disciplines to develop careers in the new energy economy with internships in solar design, engineering, strategic planning, operations efficiency, marketing and finance. Read more.

SUNGEVITY
GENERATE POSITIVE

Carbon Neutrality - What Does it Mean for Berkeley? To have net-zero carbon emissions from building energy and fleet vehicle use by the year 2025 – the newest University of California sustainability goal – Berkeley's emissions will need to be reduced by about 70% from current levels. While planning efforts are still underway, Berkeley's Cal Climate Action Partnership (CalCAP) will be focusing on a range of campus carbon reduction strategies: energy efficiency projects, installing solar panels, the green building program, reducing fleet fuel use, and evaluating other energy supply options. Read more.

Cool Campus Challenge In the fall of 2015, students, staff, and faculty across the UC system took action in the Cool Campus Challenge (CCC) to reduce their carbon footprint in response to the pressing global issues of climate disruption and to help UC meet its commitment to be carbon neutral by 2025. At Berkeley **1,750 faculty, staff and students** (or 4%) joined the challenge making pledges that will reduce **1,021,720 million of pounds of carbon** emissions each year. Berkeley had particularly high

involvement of teams within campus departments and organizations and nominations of climate heroes. Initial feedback has been largely positive: *"I am thrilled that UC has created this program to show the world that carbon neutrality is possible. Thanks for giving me a chance to do my part in this way. I've read the initiative and am ready to do more!" (UCB staff member)*. Read more.

Facilities Services Receives Industry Effective and Innovative Practices Award UC Berkeley won the 2014 APPA Effective & Innovative Practices Award for its project "*Providing Financial Incentives to Promote Energy Conservation by Building Occupants*."

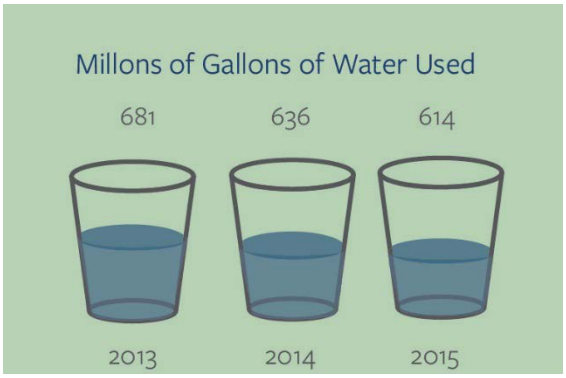
Inaugural UC Carbon Slam Winner Alexis Shusterman won the University's first Carbon Slam competition for her project BEACO2N: High-Resolution Carbon Monitoring, in the Climate Impact Live Pitch category. The Carbon Slam is a system-wide event to bring together selected students from all ten University of California campuses. Students present their climate change science and solution research in 3-minute pitches and posters before a panel of esteemed judges and guests for a chance to win cash prizes. The Carbon Slam highlights the important work that UC students and faculty are conducting to understand the impacts of climate change and to develop new innovations, practices, and policies for mitigating those impacts.

Water

Use down 10% since drought

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

In total the **campus currently uses 614 million gallons of water,[2] which is almost 20% less than in 2008 – meaning the campus goal has been met twice over** (see Graph 2). Use is estimated to be down 10% since the drought declaration.



Water levels in California recently hit the lowest point since records began 100 years ago, and are only beginning to recover. In response to this severe drought, Governor Jerry Brown officially declared a statewide drought emergency, and created mandatory reductions by urban water providers of 25 percent.

While the drought restrictions are now being eased, the campus response to the drought has been proactive, from fixing leaks to changing behaviors to finding long-term reduction solutions across all areas of consumption.

Inexpensive **retrofits** that reduce the flow per flush are being installed in bathrooms in multiple buildings. The new flushometers reduce water use from 3.6 to 1.6 gallons per flush (gpf) for toilets and from 3.6 to 1.2 gpf for urinals. Bathrooms in high traffic areas have the greatest return on investment for such a retrofit.

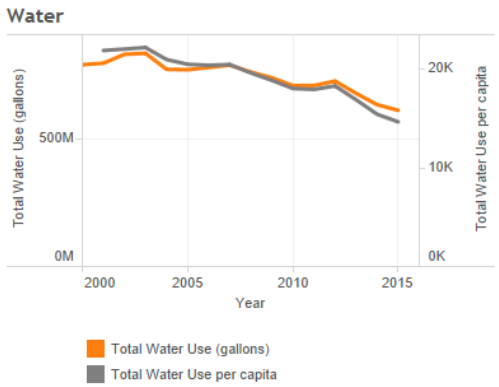
The campus recently installed and upgraded **water meters** in over twenty buildings, bringing the total number of metered buildings to 70. These digital meters allow Facilities Services to monitor usage online and respond to leaks more quickly.

In addition to addressing leaks, Facilities Services (FS) also works to investigate water use in some of the **largest-consuming campus buildings**. Starting with Life Sciences Addition, FS has monitored water meters, worked with building managers to change an Aquatics Lab policy, improved the efficiency of the cooling tower, and investigated the sump and vacuum pumps. The results are impressive: LSA's water consumption has decreased by 32%.

While **landscaping** accounts for less than 10% of campus water usage, it remains a very visible and important component. Facilities Services and others have worked to upgrade and automate the irrigation system over the last few years. Projects have included installing weather station-based controllers, drip and low precipitation sprinkler heads, and water flow meters on all systems. Upcoming work includes the installation of new flow switches to ensure repairs happen more quickly in the event of a valve or sprinkler head break.

In addition to increasing the efficiency of the **irrigation** system, the campus has also reduced the amount of irrigated lawn on campus, converting 3.5 acres of turf in the past year to use less water. This lawn conversion program was originally funded through a TGIF grant, but has now been expanded to convert unused lawns to native and drought tolerant species.

[2] Campus water use data now reflects a more accurate accounting of all accounts within the campus operational control.



Graph 2: Total Water Use

Students make a splash in water policy and technology In 2014, Rebecca Peters was named University Medalist. She graduated with honors in Society and Environment and Interdisciplinary Studies, and minored in Global Poverty and Practice. With this background, she has made it her duty to make sure everyone has access to clean water and sanitation (read more). In addition, Katya Cherukumilli is the 2014 winner in the Designing Solutions for Poverty contest and the 2015 Dow Sustainability Innovation Student Challenge for her design to purify groundwater in India.

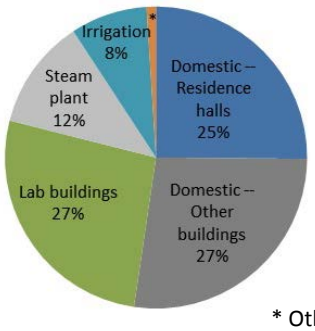
Calscape website helps Californians bring back native plants "UC Berkeley's Jepson Herbarium has teamed up with the California Native Plant Society to help homeowners across the state replace lawns and other water-thirsty plants with native California plant species. The new online tool, Calscape, helps Californians save water and bring back native flora, along with the birds, butterflies, bees and other pollinators that evolved with them."[3]
Photo credit: Walter Siegmund, CNPS

[3] Excerpt from Public Affairs, "Calscape website helps Californians bring back native plants," May 9, 2016

Students Create Low-Water Templates For Community Yards The Landscape Architecture and Environmental Planning Department partnered with the San Lorenzo Village Home Association and StopWaste to compile a booklet containing color photographs, watercolor paintings, illustrations and drought tolerant plant identifications. There are also recommendations for four drought tolerant garden designs. Read more.

Innovative stormwater management practices at Eshleman When Eshleman Hall reopened in 2015, the new building included both a rain garden and a cistern installed in the garage to collect rain water to flush toilets.

Breakdown of campus water use, by type About half of the water consumed on campus is domestic (toilets, urinals, showers, and faucets), divided equally between residence halls and all other campus buildings. About one-quarter of usage is in lab buildings (excluding their domestic usage), with irrigation and the steam plant each using about 10% of the total.



* Other

Built Environment

More award-winning buildings

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 **fifteen (15) LEED™ certified building projects, representing over 10% of total square footage**. In general, all major building projects (with total project cost greater than $5 million) are registered with the Green Building Certification Institute and are submitted for LEED™ certification and comply with other aspects of the system-wide Sustainable Practices Policy. In order to support the green building and other environmental goals, the campus also has an Energy Use Policy, updated the design standards for consistency and clarity, and has a student-supported certification program for smaller projects that fall below the threshold for LEED™ certification.

Eshleman Hall and the Martin Luther King Jr Student Union open as the campus' newest green buildings The new **Lower Sproul Plaza** is likely the most sustainable area of the UC Berkeley campus. From green building design to innovative stormwater management practices, the Lower Sproul redevelopment project worked to minimize its environmental impact across a variety of spectra. Completed in the fall of 2015, the buildings in lower Sproul have been designed with innovative sustainability features. **The Student Union is on track for LEED™ Silver certification**, and **Eshleman Hall is on track for LEED™ Gold certification** - going above and beyond the campus-wide requirement that major construction projects achieve LEED™ Silver certification at a minimum. High performance building exteriors are one of the attributes that have made this possible. These sustainable exteriors are designed to reduce energy use, reduce artificial lighting demand, and provide passive ventilation. Read more.

Jacobs Hall wins two awards Jacobs Hall, which opened in August 2015, received the Energy Efficiency In New Construction Or Major Renovation award at the 2016 California Higher Education Sustainability Conference and the 2016 Top Ten award from the American Institute of Architects in tandem with the Committee on the Environment.

Founded on the conviction that design can help address some of society's most pressing challenges, the Jacobs Institute for Design Innovation at UC Berkeley, is devoted to introducing sustainable design innovation at the center of engineering education and university life. It is designed as both a collaborative, project-based educational space and a symbol to the region of the University's commitment to sustainable innovation. The building is designed to exceed the AIA 2030 Commitment target, using 90% less energy than the national median for university buildings. It also features a cantilevered 74kW photovoltaic array, which provides 58% of the building's energy requirements.

New Campbell Hall wins award In addition to being Berkeley's 15th LEED™ certified building project, the new Campbell Hall building received the Overall Sustainable Design award at the 2015 California Higher Education Sustainability Conference. The design lexicon for the new building is at once respectful of the neighboring historic structures and also reflective of the university's mission for student-faculty interaction and sustainable design. The building process showcased best practices with respect to user engagement during design and move-in, including a commitment to conduct a user survey six months post occupancy.
Photo Credit: Public Affairs

Berkeley Team Wins Second Prize at 2015 Vertical Cities Asia Competition "On July 9, 2015 a team of seven graduate students from the University of California, Berkeley College of Environmental Design took second place in the 2015 Vertical Cities Asia International Design Competition organized by the National University of Singapore (NUS) School of Design and Environment (SDE). The team's proposal, 'Quarry Shores: Sand Mining and Water Urbanism,' was chosen by a distinguished international jury from among 18 entries from 10 universities in Asia, Europe and the United States. In its fifth year, the Vertical Cities Asia competition seeks to develop new models for high-density sustainable topologies to address problems facing a rapidly urbanizing Asia experiencing massive rural to urban migration."[4]

[4] Excerpt from UC Berkeley College of Environmental Design, "Berkeley Team Wins Second Prize at 2015 Vertical Cities Asia Competition," July 17, 2015.

Waste

Diversion rate rises, driven by composting

Goal: Achieve a 75% diversion rate by June 2012 and zero waste by 2020. *On track.*

The campus **diversion rate has increased to 54%**, with the amount of municipal solid waste being sent to landfill again dropping (down 2%). More impressively, the landfill tonnage is down by a third since 1995. The data also reveals the success of campus efforts to expand the composting program, as the campus now diverts almost 40% more than just two years ago (see Graph 3). Even with these improvements, the campus has not yet reached its diversion goals.

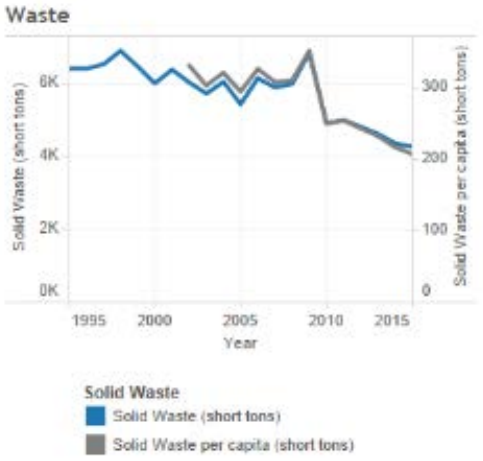
Plastic Disclosure Project results The Zero Waste Research Center conducted analysis through the Plastic Disclosure Project in order to increase transparency. Through waste audits in multiple buildings, the Center found that 28% of the waste stream is non-recyclable plastic.

Telegraph eateries urged to cut waste, embrace 'reusable' "In anticipation of Earth Week, sustainability-minded UC Berkeley students are gathering signatures and organizational endorsements for a campaign designed to help "make 'reusable' a reality on Telegraph," as they put it. Their petition calls on Southside food businesses to provide discounts of 10 cents or more to customers who provide their own cups, utensils and containers during the days before and after Earth Day, April 22. Participating businesses would also make takeout bags available solely on request, and would post signage…to advertise the discount."[5] Read more about this TGIF-funded project.

Bears are No. 1 (again) in national game-day recycling contest "The Berkeley campus has successfully defended its title in Recyclemania, the national collegiate basketball game waste-diversion competition. In its [fourth] consecutive win of the game-day challenge, Berkeley achieved its best showing yet, with 96 percent of waste being diverted from landfill."[6]

Photo credit: Cal Dance Team members Katie Russell, left, and Anne Flannigan promote the recycling message on game day.

UC Berkeley wins Pac-12 Challenge Berkeley won the first ever Pac-12 Zero Waste Challenge held by the Green Sports Alliance, and repeated in 2016. The GSA is committed to promoting sustainability through the platform of sports. Lin King, Recycling and Refuse Manager, and Katherine Walsh, Director of the Student Environmental Resource Center, accepted the 2015 award at the Green Sports Summit in Chicago. Read more.



Graph 3: Total Solid Waste

[5] Excerpt from Cathy Cockrell, NewsCenter, "Telegraph eateries urged to cut waste, embrace 'reusable'," March 12, 2015.

[6] Excerpt from NewsCenter, "Bears are No. 1 (again) in national game-day recycling contest," April 15, 2015.

Procurement

Data challenges continue

Goal: Comply with the University of California environmentally-preferable purchasing policies and procedures. *On track.*

UC Berkeley operates under a decentralized procurement model, with purchases made via multiple avenues. The Supply Chain Management team has worked to offer efficient procurement services through programs like BearBuy and Strategic Sourcing, delivering savings and providing better overall service. They also strive to comply with UC Sustainability Practices policy by incorporating environmentally friendly products and services. The University of California also provides resources for suppliers on the University code of conduct for licensees and sustainable and ethical supply chain practices.

However, collecting complete and accurate data on the purchases of sustainable products remains problematic. Often, purchasing data must be compiled by vendor or product type, and sometimes the spend on identified green products has to be calculated manually.

One area of success is the **continued increase in purchases of recycled content copy paper** – up 17 percentage points in two years. BearBuy users now have the option to purchase 100% recycled content paper. Previously a brand of 30% recycled content paper was the university's cheapest recycled content paper, according to Alex Butler, Strategic Sourcing. However, the new 100% recycled copy paper is both cheaper and more environmentally-friendly. The Georgia Pacific Spectrum copy paper is produced completely from post-consumer recycled fiber, and performs at the same high standard as non-recycled papers. Read more.

Other initiatives of Supply Chain Management:

- Continued the printer exchange program, replacing 54 older inefficient ones with only 50 Energy Star rated alternative
- Participation in MilliporeSigma's styrofoam and packaging reuse program
- Implementation of Sigma's "Sustainability Opportunity Dashboard," which provides green sustainability statistics on solvent usage and packaging waste
- Feasibility research on a water-saving autoclave that can reduce water consumption by 90%

Food

Focus on local purchases

Goal: By 2020, increase sustainable food purchases by campus foodservice providers to at least 20%. *On track.*

Making foodservice operations more sustainable visibly improves the overall campus purchasing and waste performance. Vendors continue to **increase the percentage of their purchases of sustainable food, reaching 30% in 2015**. With new staff focused on sustainability at Cal Dining, these purchases – and the awareness of them – should continue to grow.

New Food Systems minor New in the fall of 2015, the Food Systems minor, hosted by the Department of Environmental Science, Policy & Management (ESPM) at the College of Natural Resources, is an interdisciplinary program that explores the role of food within the environment and society. Drawing from diverse fields as far ranging as ecology, sociology, the humanities, nutrition, history, and economics, the food systems minor critically examines issues of contemporary food and agriculture from a whole-systems perspective. Students who complete the minor will gain a broad and interdisciplinary understanding of critical themes and concepts of contemporary food and agriculture systems both domestically and internationally.

Berkeley a big part of new UC initiative on global food needs "The University of California [launched] an initiative to marshal resources across the UC campuses — including Berkeley's 90 courses, 150 faculty and staff and multiple institutes and centers devoted to the study of agriculture and food — to address global challenges related to food." [7]

From San Francisco Sea Salt to Mt Lassen Trout For the past 2 years, in celebration of food day and earth day, Cal Dining has hosted "extreme local" theme meals in each of the four resident dining halls at UC Berkeley. Every ingredient served on the menu those nights are grown, raised, and distributed within 250 miles of the UC Berkeley campus. Among some of the ingredients, this year's menu features locally harvested San Francisco Bay Sea Salt, California Pink Peppercorn, Mt Lassen Trout, and Imperfect Butternut Squash. Anything outside 250 miles was not available, so soda fountains and coffee machines were turned off for those nights and cereals weren't offered. Cal Dining received great feedback from the students – 74% of the students surveyed were very satisfied with the meal. In the summer of 2015, the extreme local theme meal won the Loyal E. Horton Grand Prize in the NACUFS National Conference.

Golden Bear Cafe stops serving fried food, turns to healthier options "Cal Dining has stopped serving fried foods at the Golden Bear Cafe, instead choosing to focus on healthier and more sustainable options. The decision was officially implemented after the spring semester ended, according to Shawn LaPean, executive director of Cal Dining, and has drawn some criticism from students. He said Cal Dining has been changing menus in order to better reflect the campus and its food and wellness programs. Instead of fried chicken, the cafe [now serves] burritos."[8]

[7] Excerpt from Public Affairs, Berkeley Research, "Berkeley a big part of new UC initiative on global food needs," July 1, 2014

[8] Excerpt from Sujin Shin, Daily Cal, "Golden Bear Cafe stops serving fried food, turns to healthier options," July 16, 2015.

Food Day star: new 'plant-forward' Brown's cafe "Honey from American Canyon. Olive oil from Chico. Brown rice from Richvale. Goat cheese from Sonoma. Lean lamb bacon from Dixon. White beans from Half Moon Bay. A vegan kale, pomegranate and roasted butternut squash salad is among the harvest salads on Brown's winter menu…Brown's menu consists almost entirely of local foods that are grown, milled, preserved and processed within 250 miles of the Berkeley campus. A map of California displayed at the event displayed the more than 20 cities from Chico to Monterey where the ingredients are sourced."[9] Brown's won the 2016 Best Practice Award for Sustainable Food Systems.
Photo credit: Josephine Wu

Food justice experts talk power, policy "The food movement isn't just about healthy eating and sustainability. It's about justice for those who work within food systems. That was the focus of a recent campus forum, 'Cultivating Justice in Food Systems: People, Power and Policy,' sponsored by the UC Berkeley Food Institute with co-sponsorship by the College of Natural Resources, the Student Environmental Resource Center, the School of Public Health and the UC Global Food Initiative." [10]

Update on the Clark Kerr Garden The garden was revamped in the summer of 2015 when Cal Dining dedicated a team of students to regularly maintain the garden, with TGIF assistance. The food at the garden is harvested regularly and used by the chefs in the CKC dining hall. To provide the dining hall with ingredients in volume, the garden mainly focuses on growing herbs and lettuces. The garden also has a small orchard growing apricots, apples, persimmons, pineapple guavas, and now, California pink pepper. Susanne Weisman oversees the operations and has held several workshops with the students to teach them techniques to improve their yields. During one workshop, students learned how to install drip irrigation lines in each of the garden beds.
Photo credit: SERC

Six at Berkeley receive new 30 Under 30 Award for global food crisis work "Six of 30 young people honored today by the University of California for their innovative work helping to solve the global food crisis are from the Berkeley campus. A mix of alumni and graduate students, they are winners of the inaugural Global Food Initiative 30 Under 30 Awards, a UC competition open to individuals around the world under age 30 who have contributed to fields including food production, food access and security, food sourcing, food education and communication, and food policy and public impact."[11]

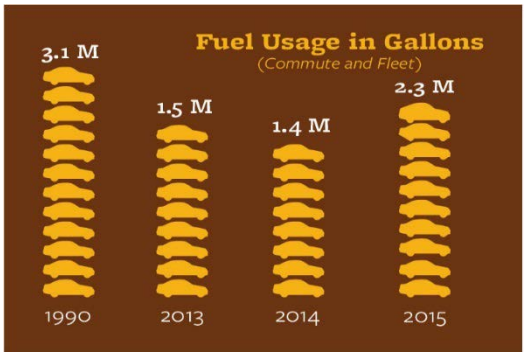
[9] Excerpt from Gretchen Kell, NewsCenter, "Food Day star: new 'plant-forward Brown's café," October 22, 2015.
[10] Excerpt from Anne Brice, NewsCenter, "Food justice experts talk power, policy," April 8, 2015.
[11] Excerpt from Gretchen Kell, NewsCenter, "Six at Berkeley receive new 30 under 30 Award for global food crisis work," June 14, 2016.

Transportation

Improvements for bicyclists

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

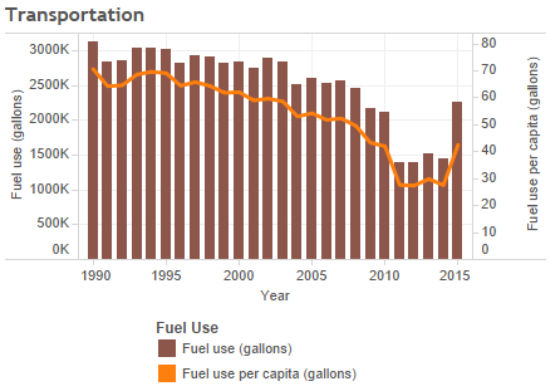
Campus fuel use – from fleet and commute – **remains over 25% below 1990 levels**. The most recent triennial transportation survey of faculty, staff, and students showed a continued decline in drive alone rates (see Graph 4), with more people opting to use public transit for their commutes.



The estimated commute fuel use increased in 2015 from prior years (see Graph 5). Because commuting in private vehicles has actually decreased over time, the increase is largely attributable to methodology changes with determining the commute distance and application of fuel efficiency to that average. In 2015, an average commute distance was calculated for each commute mode rather than an aggregate commute distance across all modes, as was done in prior years. Vehicle commuters tend to travel longer distances and have a higher average commute distance compared to transit riders, bicycle commuters or walk commuters. Additionally fuel efficiency assumptions have been updated to reflect CA specific vehicle mix, rather than a national average. Campus sustainable transportation programs have been very effective in encouraging those living within reasonable walking, bicycling or transit distance to campus to use those more sustainable commute modes.

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 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. Parking & Transportation will be launching revised rideshare and carpool programs as well as a green commuter club with fun incentives in the fall of 2016.

Bay Area Bike Share Expands to Berkeley The Metropolitan Transportation Commission (MTC) recently announced that Bay Area Bike Share, the regional bike share system, will be expanded into Berkeley, Oakland and Emeryville over the next two years, with a target of adding 400 bicycles in Berkeley, 850 bicycles in Oakland and 100 bicycles in Emeryville. The expansion will coincide with expansions in San Francisco and San Jose, where the existing bike share system is already in place. Read more.



Graph 4: Mode Splits

Other bike-related news:

- The TGIF funded 2015 Bicycle Parking Improvement Project added approximately 120 additional bicycle parking spaces in those areas of the central campus most in need of new bike racks.
- There are now over **5,500 people commuting by bicycle to campus** on a typical school day. The campus transportation survey found that over 12% of all campus commuters ride a bike to campus – nearly 21% of faculty, 9% of staff, 27% of graduate students, and 7% of undergraduates commute by bike. Since 2012, bicycle commuting has increased by about 1.4%.
- Campus **bike theft has gone down 45%** since UCPD began deploying "bait bikes" equipped with tracking systems that enable officers to locate the bikes after they are stolen.

Alternative Mode Splits, 1990-2015

Survey Years	1990/1992	2005/2006	2011	2015
Faculty and Staff	**1990**	**2006**	**2011**	**2015**
Drive alone	60.0%	47.1%	44.2%	42.5%
Walk	12.0%	7.7%	8.5%	7.9%
Transit	12.0%	24.3%	22.8%	29.2%
Bicycle	5.0%	7.5%	9.7%	10.7%
Rideshare	10.0%	11.5%	11.9%	6.7%
Other	1.0%	1.9%	2.0%	2.9%
Students	**1992**	**2005**	**2011**	**2015**
Drive alone	10.7%	8.0%	5.3%	5.8%
Walk	45.5%	46.8%	63.2%	54.3%
Transit	18.8%	31.9%	16.6%	23.8%
Bicycle	16.7%	9.4%	12.2%	12.7%
Rideshare	4.4%	2.7%	1.2%	1.6%
Other	3.9%	1.2%	0.7%	1.8%

Graph 5: Transportation Fuel Use

Land Use

New Strawberry Creek restoration project

The campus works to ensure that major projects reflect established campus planning and land use principles. Physical and Environmental Planning (PEP) within the Real Estate division provides comprehensive general, environmental, and project planning services for the Berkeley campus. PEP is also responsible for conducting a regular housing and transportation survey, and for ensuring that the campus is in compliance with the state-mandated California Environmental Quality Act (CEQA). PEP's planning efforts are guided by the campus' Long Range Development Plan (LRDP) and its updates.

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. 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).

Strawberry Creek Ecological Stabilization Project The most recent and ambitious campus restoration project on Strawberry Creek was finalized in early 2015. The Strawberry Creek Ecological Stabilization Project was a student research and design group working in collaboration with campus staff, faculty, and external experts to design and implement solutions to improve riparian habitat and ecological function at the confluence the north and south forks of Strawberry Creek. According to their website, "the project scope includes removing the remnants of two failing check dams near the confluence and installing two rock step-pool structures and one log drop structure in order to develop stable bed slope conditions. The bank slopes will be laid back and planted with native vegetation to improve stability and provide habitat. Interpretive signage will be designed and installed on the site."[12]

Photo: Looking at right bank – May 2015 (project website)

Botanical Garden celebrates 125 years of research, romance "During its 125 years of existence, the University of California Botanical Garden has served as a haven for endangered plants rescued from smugglers, a lab for studying climate change, biomagnetism and hummingbirds' territorial behavior, a seed bank, a classroom for children and an idyllic backdrop for weddings. The garden, home to one of the oldest, largest and most diverse collections in the United States," celebrated its 125 year anniversary on June 28, 2015.[13]

Student project wins EPA award Berkeley's Campus RainWorks Challenge entry, *Unbound: Stormwater Infrastructure as Living Laboratory, Habitat, and Human Spaces,* won second place in the Demonstration Project category of the 2015 Campus RainWorks Challenge.

[12] Strawberry Creek Ecological Stabilization Project website, accessed June 13, 2016

[13] Excerpt from Kathleen Maclay, NewsCenter, "Botanical Garden celebrates 125 years of research, romance," June 25, 2015.

Academics & Learning by Doing

Continued excellence in teaching and research

The university offers more than 10,000 undergraduate and graduate courses in 277 degree programs, and has a 17 to 1 student-to-faculty ratio.[14] A recent review of courses offered on campus reveals UC Berkeley offers at least **560 sustainability courses**. There are courses on the list from 46 different departments, including Geography 137 *Top Ten Global Environmental Problems* and ESPM C282 *Health Implications of Climate Change*. In 2013-14, 29% of undergraduates took at least one course focused on sustainability.

To the rescue: Berkeley names Faculty Climate Action Champion "**Whendee Silver** might not think of herself as an action hero, but the professor of environmental science, policy and management today was named UC Berkeley's first Faculty Climate Action Champion. The honor, for outstanding teaching, research and public service in the areas of climate change solutions, action and broad engagement, is part of a new pilot program that supports UC President Janet Napolitano's UC 2025 Carbon Neutrality Initiative.

"In an effort to increase the amount of atmospheric carbon dioxide absorbed by ecosystems, Silver devises and tests viable approaches to slowing climate change with a focus on soils. Soils are the second-largest pool of carbon on Earth's surface – they store three times more carbon than does the atmosphere or vegetation. But overgrazing and crop cultivation have led to widespread soil carbon losses."[15] Photo credit: Kira Stoll

Best Global Universities for Environment/Ecology UC Berkeley's Environmental Sciences, Policy and Management department was ranked number 1 by US News & World Report.

Three New Chairs Confront Global Energy Three new chairs have been established within the Engineering department and the Berkeley Energy and Climate Institute for "transformational research on pressing energy challenges."

Research Highlights

Study says California solar boom makes the state a national leader, prepares new generation of workers "Strong statewide and federal clean-energy policies have positioned California as the nation's solar energy leader in terms of generating new, well-paying construction and permanent jobs while working to curb climate change, according to a new report by UC Berkeley. The Donald Vial Center on Employment in the Green Economy at Berkeley found that California's use of electricity from renewable sources increased from 11 percent in 2008 to nearly 20 percent in 2013. The center's report, 'Environmental and Economic Benefits of Building Solar in California' notes that more than 15,000 new jobs have been created over the last five years by California's solar-farm construction boom, with workers building solar arrays earning on average $78,000 a year plus health and other benefits."[16]

New material captures carbon at half the energy cost "UC Berkeley chemists have made a major leap forward in carbon-capture technology with a material that can efficiently remove carbon from the ambient air of a submarine as readily as from the polluted emissions of a coal-fired power plant."[17]

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[14] http://www.berkeley.edu/about/bythenumbers accessed June 1, 2016.

[15] Excerpt from Gretchen Kell, NewsCenter, "To the rescue: Berkeley names Faculty Climate Action Champion," September 29, 2015.

[16] Excerpt from Kathleen Maclay, Berkeley News, "Study says California solar boom makes the state a national leader, prepares new generation of workers," November 10, 2014.

[17] Excerpt from Robert Sanders, Berkeley Research, "New material captures carbon at half the energy cost," March 11, 2015.

Electricity from biomass with carbon capture could make western U.S. carbon-negative "Generating electricity from biomass, such as urban waste and sustainably-sourced forest and crop residues, is one strategy for reducing greenhouse gas emissions, because it is carbon-neutral: it produces as much carbon as the plants suck out of the atmosphere. A new UC Berkeley study shows that if biomass electricity production is combined with carbon capture and sequestration in the western United States, power generators could actually store more carbon than they emit and make a critical contribution to an overall zero-carbon future by the second half of the 21st century." [18]

Researcher calls report on economic impacts of U.S. climate change 'like a flashlight at night' "UC Berkeley, economist and assistant professor of public policy Solomon Hsiang led the econometrics team that helped assemble a major report released [in June 2014] that projects significant economic risks from climate change in the United States." [19]

Teen girls see big drop in chemical exposure with switch in cosmetics "A new study led by researchers at UC Berkeley and Clinica de Salud del Valle de Salinas demonstrates how even a short break from certain kinds of makeup, shampoos and lotions can lead to a significant drop in levels of hormone-disrupting chemicals in the body."[20]

Reverse Cycle: Inspired by Leaves, a New Invention Turns Sunlight and Water into Fuel "For the past ten years, Peidong Yang has been trying to make like a tree. Yang, a professor in UC Berkeley's Department of Chemistry, researches artificial photosynthesis, a process that mimics a leaf's ability to convert sun, water, and carbon dioxide into fuel. But in his case, the fuel isn't glucose – it's gasoline."[21]

The search for smarter energy and water strategies "As the changing climate disrupts familiar weather patterns, many countries face a dual threat: swamping along the coasts, but also unexpected shrinking freshwater supplies in many regions. 'Water has never been evenly distributed around the world, but droughts and an alarming decrease in groundwater create potentially catastrophic conditions,' says Ashok Gadgil, Deputy for Science and Technology for the Energy Technologies Area at LBNL and professor of environmental engineering at UC Berkeley."[22]

Berkeley air-monitoring project wins White House nod "The White House has given a public nod to a ground-breaking UC Berkeley air-monitoring project and its new collaboration with a Colorado public media platform, which aims to build a citizen-science story-corps to help monitor carbon emissions in the Bay Area." [23]

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[18] Excerpt from Robert Sanders, Berkeley Research, "Electricity from biomass with carbon capture could make western U.S. carbon-negative," February 9, 2015.
[19] Excerpt from Kathleen Maclay, Berkeley Research, "Researcher calls report on economic impacts of U.S. climate change 'like a flashlight at night'," June 24, 2014.
[20] Excerpt from Sarah Yang, NewsCenter, "Teen girls see big drop in chemical exposure with switch in cosmetics," March 7, 2016.
[21] Excerpt from Chelsea Leu, California Magazine, "Reverse Cycle: Inspired by Leaves, a New Invention Turns Sunlight and Water into Fuel," Spring 2015.
[22] Excerpt from Wallace Ravven, Berkeley Research, "The search for smarter energy and water strategies," April 25, 2016.
[23] Excerpt from Public Affairs, NewsCenter, "Berkeley air-monitoring project wins White House nod," August 22, 2014.

Across Campus

Community of sustainability growing

There is important work being done campus-wide to improve the culture of sustainability at UC Berkeley. These measures – campus committees and organizations, grants, newsletters, reports, and other initiatives – serve to ensure that sustainability is institutionalized on campus. Campus entities received multiple awards, including being recognized in the top 15 of the Sierra Cool Schools ranking.

The Office of Sustainability and Energy provides leadership to campus by developing ambitious sustainability strategies and by accelerating their implementation. Our mission is to integrate cutting-edge sustainability practices into our operations and foster a culture of sustainability at home and in the world. We work to achieve climate neutrality with a focus on reducing energy use, manage communication efforts across campus, and lead faculty, staff, and student engagement.

The Office also oversees sustainability policy and goal-setting, executing the 2009 Campus Sustainability Plan and the University of California "UCOP Sustainable Practices Policy," which outlines the system-wide efforts to minimize environmental impacts and increase usage of renewable energy.

The campus community continues to find ways to expand their engagement and build new institutional links. In the last two years, the number of student environmental groups rose to almost 50, certified green events rose to over 200, and 20% of faculty and staff are part of a certified green department.

Other examples include:

- In April 2016, The Green Initiative Fund was renewed for an additional 10 years by a 68% 'yes' vote. Since its inaugural grant cycle in spring 2008, TGIF has awarded more than $2 million in grants to 160 grant projects. These projects have included the funding of 245 student sustainability interns, working an estimated 19,000+ hours on TGIF-funded projects.

The Green Initiative Fund

- SERC, a student-driven Center dedicated to advising, developing, and resourcing students and student organizations, campaigns, initiatives, and campus projects focused on sustainability and environmentalism, celebrated its fourth full year. They will move into new permanent space in the MLK Jr. Student Union in fall of 2018.
- In May 2016, 10 departments were certified as part of a TGIF-funded 'Semester of Green Departments." There are now 23 certified departments, representing over 3,000 employees. This means that 20% of staff and faculty are part of a department that has been recognized as green. Read **more** about our newest departments here.
- The campus was highlighted in the IARU Green Guide for Universities, which addresses key areas of sustainability at universities, ranging from laboratory design to managerial and organizational aspects.
- The 11-student 2016 Solar Spring Break Team spent spring break with GRID Alternatives installing a 3.03 kW-AC system for a Richmond homeowner.
- SERC taught 11 sustainability-focused DeCals from 2014-2016 and sponsored an additional 11 DeCals through the 2015-2016 SERC DeCal Fellowship.

Kira Stoll – Chancellor's Outstanding Staff Award (COSA) winner Kira Stoll has been a sustainability champion her entire career. She has brought a spirit of innovation to her role, leading exceptional projects, and demonstrating to her colleagues how to be an effective and inclusive change leader. Kira's consensus-building style helps her build a constituency and a community for sustainability. She received the COSA award for her work on two extraordinary projects.

The first is the system-wide Cool Campus Challenge, which finished in December 2015. Kira co-designed and spearheaded the Challenge, during which more than 19,000 University of California students, staff, and faculty pledged to take steps that will save over 20 million pounds of greenhouse gas emissions annually. Kira also spearheaded a solar energy procurement project to bring 1MW of photovoltaic energy to campus, through a collaborative RFQ with 19 other public agencies.

CACS Sustainability Award Winners
Each year, CACS formally recognizes the contributions of those helping meet our sustainability goals. The campus is indebted to the hard work of the below winners from 2015 and 2016 for making Berkeley a more sustainable place to work, live, and play:

2016
Sunil Chacko (Purchasing/ Commodity Coordinator at Cal Dining) – Sunil is a dedicated staff member of Cal Dining who is eager to improve sourcing practices. He always prioritizes products that are humanely raised, organic, local, and socially responsible. He is also eager to bring in healthier products and ingredients for our guests and students. Sunil was critical to the success of Browns, and his work has certainly made this campus's food better for our students, faculty, staff, and visitors.

Susanne Wiesman (Grounds Operations, Clark Kerr Campus) – Susanne has been critical to improving the Clark Kerr Campus Garden. Susanne works closely with a team of students and coaches them on how to make the garden successful and bountiful. Because the students can only dedicate a couple of hours a week at the garden, she regularly maintains the garden ensuring it is getting watered properly and is free of weeds and pests.

ASUC Sustainability Team (STeam) – Established in fall 2005, STeam is an ASUC-sponsored organization with many well-known and impactful projects. Congratulations to STeam for over 10 years of success! (Team members: Jean Ji, Elena Leander, Serena Tam, Dennis Uyat, Ryan Lynch, Kielan Rathjen, Kevin Wang, Hayley Davis, Tyler Jacobson, Sydney Higa, Natalia Mushegian)

Solar Powering Cal team ("It Takes a Village to Harness the Power of the Sun") – Thanks to the efforts of the team over three years, four solar PV arrays (at MLK Student Union, Eshleman Hall, Recreational Sports, and University Village) are now operational, helping the campus achieve sustainable energy use and carbon neutrality. (Team members: Lindsey Agnew, Jim Wert, Jonathan Winters, Marianne Metallo, Gilbert Escobar, Katherine Walsh, Kira Stoll, Michael Neuwald, David Robinson, Jerry Jimenez)

2015
Student Environmental Resource Center – The Student Environmental Resource Center cultivates a collaborative space to strengthen the collective effectiveness of the sustainability community, and provides resources for students to actualize their visions of a more equitable, socially just, and resilient future. SERC's vision is "Sustainability education for every UC Berkeley student."

Megan Maurino – Megan Maurino helped build a community around water advocacy and conservation during her time as a student. Maurino helped gather campus departments and student organizations to strategize conservation efforts for the drought, and facilitated the DeCal "Thirst: Global Discourses on Water and Human Rights."

Supply Chain Management – The Supply Chain Management team has been working for several years to provide more tools to the campus to make better decisions about green purchasing. Their efforts have ranged from researching new products to highlighting green products for buyers to focusing on waste reduction efforts.

Economic Sustainability:

Economic contributions endure

This section highlights certain key economic indicators, informed by the reporting practices of the Global Reporting Initiative. These indicators highlight the contributions made by the campus on economic systems and conditions of our stakeholders and our surrounding communities.

Economic Performance

Direct Economic Value The Office of the Chief Financial Officer (CFO) is responsible for tracking and reporting on the campus economic performance. The Annual Financial Report, 2014-15 is the most recent statement of the campus finances, and shows $1.8 billion in total operating revenues, $2.7 billion in total operating expenses, and a campus net position of $3.6 billion.

The Office of the CFO's three-year strategic plan clarifies that "our main objective between FY2014 - 2017 is to provide innovative, collaborative, client-focused financial, analytical and administrative management to our campus partners while providing our team clarity, focus and the space for creativity." Specific strategies include achieving financial strength, building a service oriented model of campus engagement, and leveraging data for strategic decision making.

Financial Implications due to Climate Change The Office of Sustainability and Energy administers the Cal Climate Action Partnership, as well as leading the climate action planning for the campus. Campus climate action planning has focused on financial implications when feasible. The Office also works with Environment, Health, and Safety to monitor the regulatory issues related to California's AB32 legislation and the campus obligations under that regulation.

Lake Merritt clean-up day a success In 2015, one of the big campaigns of the CFO Appreciations Team was to give back to the community by partnering with various community groups to assist them with their projects. Their first event was April 4 – a clean-up day hosted by the Lake Merritt Institute. With

over 120 members, the Lake Merritt Institute is a community based, non-profit corporation that works with volunteers, schools and the City of Oakland. As part of the Institute's Clean Lake Program, CFO staff members filled several bags with trash and debris collected from the water and shoreline of Lake Merritt. Special thanks to Hervé Bruckert, Mehmet Sevinc, Jennifer Bellenger, Timothy Hummel, and Heidi Van Yang for participating.

New America Jobs Project "Former Michigan Gov. Jennifer Granholm, an adjunct professor of public policy at UC Berkeley and a senior research fellow at Berkeley Energy and Climate Institute, has announced the launch of The American Jobs Project. The national initiative is focused on the creation of good-paying middle-class jobs in advanced energy-economic clusters."[24]

Indirect Economic Impacts

There are numerous positive economic impacts that flow from the campus' missions of teaching, research, and public service. As a public institution, UC Berkeley reports on these benefits and helps paint a picture of the how the campus indirectly benefits the economy.

Teaching Berkeley educates a diverse group of undergraduates and works to improve their access to higher education. From the Fall 2015 Snapshot of UC Berkeley Undergraduates:

- 22% are first generation college students with neither parent having a four-year college degree
- 18% learned to speak English at age 5 or after
- 24% reported that their annual household income was less than $50,000
- 36% received a Pell Grant (2013-14)[25]

On average, students graduate from Berkeley with less debt than their peers at institutions in California and across the nation. The average debt at graduation was $17,584 at Berkeley, compared to

[24] Excerpt from Public Affairs, NewsCenter, "Granholm announces launch of America Jobs Project," March 30, 2015.

[25] http://opa.berkeley.edu/sites/default/files/2013-14_pell_grant_comparison.pdf

$21,382 for California and $28,950 for the United States.[26]

Research Berkeley conducts important research, undertaken by esteemed faculty and gifted graduate students:

- 1,298 National Science Foundation graduate research fellowships were awarded to Berkeley students from 2004 to 2013, more than any other school[27]
- 48 out of the university's 52 Ph.D. programs are ranked in the top 10 (the most in the nation), 43 Ph.D. programs ranked in the top 5, and 16 Ph.D. programs are ranked #1[28]
- Berkeley is consistently recognized as a top producer of successful Fulbright Program applicants – in 2013, 18 Berkeley students were awarded Fulbright fellowships[29]
- Over the past 10 years, UC Berkeley students have received more Ford Foundation Diversity Fellowships than students at any other institution[30]

UC Berkeley has a long legacy of innovators and leaders that have created groundbreaking products, revolutionary companies, and entirely new industries. As of the 2014 year end, Berkeley owned 1,530 total active inventions, 344 active license agreements, 687 active U.S. patents, and 610 active foreign patents.[31] An important part of UC Berkeley's research mission is to increase the public benefits from our research through developing practical applications of our research results.

Public Service and Beyond Berkeley is well known for its tradition of public service, which plays a key role in the university's teaching and research:

• 5,231 graduate and undergraduate students served community-based organizations, government offices, and schools in 2014–15
• Berkeley continues to be the only school in the country to have produced more than 3,600 Peace Corps volunteers since that organization's inception in 1961[32]

One economic impact report from 2011 showed that UC Berkeley generates $4.6 billion in annual economic activity for California and contributes $3.2 billion to the gross state product.[33] Another study reviewed the impacts of firms founded by alumni, faculty, and other affiliates and found that they were responsible for 1,247,490 jobs and $238 billion in total US economic output. Furthermore, 55% of the firms were located in the Bay area.[34]

Sustainability projects awarded 2015-16 community grants The Chancellor's Community Partnership Fund supports projects and programs that establish, extend, and/or strengthen collaborative partnerships between the campus and the wider Berkeley community. This year, two sustainability projects received awards: the Strawberry Creek Watershed Action Program teaches students hands-on science, and the Waterside Workshops provide green jobs training and a bicycle recycling program for some of the Bay Area's most at-risk youth.

[26] Cal Facts, http://admissions.berkeley.edu/sites/default/files/docs/Cal_Facts_spring_2016.pdf, accessed May 19, 2015.
[27] Cal Facts, http://admissions.berkeley.edu/sites/default/files/docs/Cal%20Facts%202015.pdf, accessed July 15, 2015.
[28] http://vcresearch.berkeley.edu/excellence/student-excellence, accessed July 20, 2015.
[29] Ibid.
[30] Ibid.
[31] http://vcresearch.berkeley.edu/excellence/innovation-and-entrepreneurship, accessed July 20, 2015.
[32] Cal Facts, http://admissions.berkeley.edu/sites/default/files/docs/Cal_Facts_spring_2016.pdf, accessed May 19, 2015.
[33] "The University of California's Economic Contribution to the State of California," Economic & Planning Systems, Inc., 9/12/2011. http://regents.universityofcalifornia.edu/regmeet/sept11/f7attach.pdf
[34] "Stimulating Entrepreneurship in the Bay Area and Nationwide: An Exploration of the Economic Contributions of UC Berkeley through Company Formations by Alumni, Faculty, and Affiliates," Bay Area Council Economic Institute, 2014. http://www.bayareaeconomy.org/media/files/pdf/UCBerkeleyEntrepreneurshipEconomicImpactAnalysis2014.pdf

Social Sustainability:
Expanded context for reporting

This section highlights key social sustainability indicators, such as data on worker safety, diversity, and employment. Data are already publicly reported by other campus units.

Occupational, Health, and Safety

UC Berkeley has multiple programs in place to address employee and student health and well-being. The Office of Environment, Health, & Safety (EH&S) aims to "provide guidance and services to the campus community that promote health, safety, and environmental stewardship" and publishes an annual report describing the range of their activities. The report includes updates on lab safety, emergency management, and life safety.

University Health Services (UHS) provides "comprehensive medical, mental health, and health promotion services to all Cal students and a variety of occupational health services to faculty and staff," as outlined in their Strategic Plan. In addition, there are additional programs that support a healthy work environment, including Cal Recreational Sports and Berkeley's award-winning wellness program Health*Matters.

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 shows 472 recordable injuries and illnesses in 2014.[35]

Training and Education

UC Berkeley offers a wide range of training and educational opportunities for staff to improve their knowledge and skills. The Human Resources department catalogs a range of offerings on their website, and some departments offer additional training beyond these. 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. 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. It is not, however, possible at this time to capture all training being done across campus or to report the average time spent in training.

The campus recently launched the Wisdom Café, an online learning community and the place for Berkeley staff to learn from and share with each other. Sections include learning, managing, professional development, and community. Staff are encouraged to participate by submitting articles, recommending videos or readings, joining the Twitter stream, sharing career stories, giving advice to fellow staff on how to use tools and systems, pose and answer questions, etc. The Wisdom Café is sponsored by Berkeley HR's Talent and Organization Performance (TOP) department. It was developed in 2014-2015, with TOP's Inette Dishler as the project lead.

Diversity and Equal Opportunity

Managing a diverse workforce contributes to staff retention and productivity. It enhances our organization's responsiveness to an increasingly diverse world of customers, improves relations with the surrounding community, increases our ability to cope with change, and expands the creativity of our organization. In addition to supporting these business goals, managing diversity contributes to goals unique to UC Berkeley as a public institution, such as increased accessibility and accountability to all residents of the state. The campus maintains a website to provide information and resources on Diversity, Equal Employment Opportunity (EEO), and Affirmative Action (AA). Responsibility for the implementation of EEO and AA lies with supervisors, managers, and senior leaders across campus.

[35] http://uhs.berkeley.edu/facstaff/dms/pdf/OSHA_Annual_Summary_2014.pdf, accessed 9/22/2015.

The Division of Equity and Inclusion provides leadership and accountability to resolve systemic inequities for all members of UC Berkeley through engaged research, teaching, and public service, and by expanding pathways for access and success and promoting a healthy and engaging campus climate. The Division's goals are driven by the UC Berkeley Strategic Plan for Equity, Inclusion and Diversity and its annual priorities are organized by the three top-level strategies of the Plan: a) Responsive Research, Teaching and Public Service, b) Engaging and Healthy Campus climate, and c) Expanded Pathways for Access and Success.

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. The campus also 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.

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.

Creation of New African American Initiative In September 2015, Chancellor Dirks announced a critical initiative to address the underrepresentation of African American students, faculty, and staff at UC Berkeley. The goals of The African American Initiative are to achieve and sustain a critical mass of African American students, faculty and senior staff at Berkeley; ensure that the African Americans who are here now feel welcome, supported and respected; and achieve the reality and deliver the message that Berkeley is a welcoming place for African Americans.

University of California Sets $15/hour Minimum Wage In July 2015, University of California President Janet Napolitano announced that the minimum wage for its workers — both direct and service contract employees — will be raised to $15 an hour over the next three years. In addition, she directed that all contractors doing business with UC comply with government and university workplace laws and policies. The Fair Wage/Fair Work Plan, unveiled at today's Board of Regents meeting, requires that all University of California employees hired to work at least 20 hours a week be paid at least $15 per hour over the course of the next three years. The mandated minimum will increase to $13 an hour on Oct. 1, 2015, to $14 an hour on Oct. 1, 2016, and to $15 an hour on Oct. 1, 2017.

Student Satisfaction

The UC Undergrad Experience Survey (UCUES) 2014 was administered to all UC Berkeley undergraduate students enrolled in spring semester 2014, excluding students under 18 years of age. From this population of 25,402 enrolled undergraduates, 9,784 (39%) responded to at least one of the items in the first block of questions and 8,019 (32% of those invited) made it through to the end of the survey and submitted it. In addition to the core UCUES items, each student was randomly assigned to one of two topical modules. Those modules were the Academic Experience & Student Engagement module, and the Wild Card module. The Wild Card is a special topics module unique to the Berkeley campus and focused on academic and co-curricular advising in 2014.

Key findings in 2014 include:
• 87% agree (somewhat agree, agree, or strongly agree) that "Berkeley has a strong commitment to undergraduate education"
• 74% are satisfied (somewhat satisfied, satisfied, or very satisfied) with the "value of your education for the price you're paying"
• 86% agree (somewhat agree, agree, or strongly agree) with the statement "knowing what I know now, I would still choose to enroll at this campus"

Findings from another system-wide survey, this one focused on campus climate, "show that a clear majority — 76 percent — of respondents report being 'comfortable' or 'very comfortable' with the campus climate at Berkeley and with their experiences relating to characteristics such as race, gender, sexuality, disability status, citizenship status and religion. But at the same time, 26 percent reported less satisfaction with the campus climate and said they had personally experienced exclusionary, intimidating, or hostile conduct. In this group were higher percentages of underrepresented minorities, people of color and multi-minorities,

women, LGBQ, transgender and genderqueer respondents and staff."[36]

UC regents discuss food insecurity, systemwide initiatives "The UC Board of Regents discussed efforts to institutionalize food security across the university at its [May 2015] meeting. The Food Access and Security Subcommittee — part of the UC Global Food Initiative, launched by UC President Janet Napolitano in July 2014 — provided to the board information about the extent of food insecurity at the university. It also proposed a model to alleviate the issue, with initiatives on both campus wide and system wide levels." [37]

Bones to Pick: UC Berkeley Paleontologist Entices Diverse Students to Dig Her Field "Lisa White scrunches her nose and holds a magnifying glass up to one eye to inspect a peanut-sized vial seemingly full of large tan and ivory sand grains. But a closer look reveals rods, stars and corkscrews—the 50-million-year-old fossilized shells of forams, creatures that still populate the oceans today. "You're gonna see some cool stuff in here," White, a 53-year-old paleontologist, promises the seventh-graders who surround her in a circle of khakis and green sweatshirts. These mostly Latino students from Urban Promise Academy in Oakland's Fruitvale neighborhood are her target audience—minority kids she hopes to incite with her own passion for science.[38]

Tribal elder brings water history to life for students "California's record-breaking drought may be a wake-up call for many Golden State residents. But for Harry Williams, a Bishop Paiute elder whose reservation occupies 900 parched acres near the California-Nevada border, water scarcity is anything but new. Back home in the Owens Valley, starting point of the aqueduct that makes metropolitan Los Angeles possible, 'we have our own man-made drought,' Williams told a group of Berkeley undergraduates recently as they pored over rare archival materials on California water history."[39]

Photo Credit: Steve McConnell, Public Affairs

[36] Excerpt from Public Affairs, "Results of unprecedented campus-climate survey released," March 19, 2014.
[37] Excerpt from Sahil Chinoy, Daily Cal, "UC regents discuss food insecurity, systemwide initiatives," May 21, 2015.
[38] Excerpt from Molly Sharlach, California Magazine, "Bones to Pick: UC Berkeley Paleontologist Entices Diverse Students to Dig Her Field," July 25, 2014.
[39] Excerpt from Cathy Cockrell, "Tribal elder brings water history to life for students," September 8, 2015.

Annual Sustainability Metrics: 1990-2015

	1990	1995	2000	2013	2014	2015
Energy & Climate						
Total greenhouse gases (metric tons CO2 eq.)	160,389	165,260	193,955	152,785	146,868	153,460
- GHG Scope 1	10,635	11,368	11,100	13,963	12,141	12,097
- GHG Scope 2	100,753	105,869	136,182	103,823	98,305	97,276
- GHG Scope 3	49,001	48,023	46,637	34,999	36,422	44,087
Electricity (kWh)	156,793,403	174,820,676	188,778,537	211,786,848	213,634,104	213,839,330
Steam (MMBtu)	968,246	975,972	983,760	985,201	892,337	868,493
Natural gas (MMBtu)	152,230	165,425	159,537	223,462	193,462	194,174
Total energy (Gjoules)	1,747,533	1,834,522	1,886,776	2,038,623	1,915,545	1,891,860
Renewable energy				100 kW	0	0
Renewable energy certificates (metric tons CO_2)				0	0	0
Water						
Water (millions of gallons)	775.7	812.5	793.6	681.0	636.2	614.1
Wastewater (millions of gallons)	543.0	568.8	555.5	476.7	445.4	429.9
Built Environment						
LEED™ buildings (#/square footage)				14 (1,596,403 ft²)	15 (1,678,149 ft²)	15 (1,678,149 ft²)
Procurement						
Recycled paper purchases (% of total copy, fine, and computer paper purchases)				71%	76%	88%
Transportation						
Fuel usage – commute and fleet (gal)	3,118,671	3,009,282	2,829,705	1,524,969	1,442,678	2,258,620
Green fleet (%)				22.9%	32.7%	34.5%
Air travel (miles)				113,884,430	124,947,320	126,619,232
	FY90	**FY95**	**FY00**	**FY13**	**FY14**	**FY15**
Waste						
Solid waste (short tons)		6,414	6,385	4,622	4,360	4,271
Diverted waste (short tons)		1,705	3,157	7,733	4,407	5,261
- Recycled waste		1,705	2,374	1978	1,844	1,669
- Construction waste				4,216	1,062	1,536
- Reusables				231	20	17
- Composting			783	1,308	1,481	2,039
Diversion rate (%)		21%	33%	63%/43%	50%/44%	54%/48%
Hazardous Waste (tons)		801	341	184	162	226
Food						
Total sustainable purchases (%)				28%	27%	31%
Other						
Population	44,120	43,509	45,565	50,511	51,109	52,285
Gross Square footage	12,817,517	13,520,471	14,145,728	16,862,738	16,314,262	16,337,525
Research	$309,755,000	$333,613,000	$415,408,000	$500,879,000	$515,518,000	$523,289,000

Annual Sustainability Metrics:
Sources and Changes from Previous Reports

Data from 2015 CalCAP inventory (June 2016 version) unless otherwise noted (http://calcap.berkeley.edu). Most waste data is from Campus Recycling & Refuse Services and is now being reported by fiscal year.

Greenhouse gases: Total greenhouse gas emissions (the basis for the campus reduction goal) includes Scope 1,2,&3 emissions. Data updated to reflect more accurate steam emissions factor.

Renewable energy: The onsite photovoltaic installation on the Student Union was removed as part of a building renovation. The solar thermal system at 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.

Water: Data now reflects a more accurate accounting of all accounts within the campus operational control. Lack of metering does not allow water use for some LBNL buildings to be excluded. As much as 24,000 gallons of rainwater are reused each year for irrigation at the Boalt Law School. Rainwater reuse at Eshleman will be estimated in future reports.

LEED™ buildings: Gross square footage for certified building projects from Judy Chess, personal communications.

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

Fuel usage: Includes gasoline for commutes; includes gasoline, diesel, E85, and biodiesel for fleet. Fleet diesel use updated with more accurate data. Business car share fuel use included starting in 2014. 2015 commute fuel use reflects a shift in commute distance calculation methodology that excludes individuals living within a ½ mile of campus.

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

Solid waste: All waste sent to a landfill, excluding hazardous and construction. All data now being reported on a fiscal year basis.

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

Construction waste: Waste 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: Included in Recycled waste prior to FY13.

Diversion rate: The higher number is the percentage of all non-hazardous waste 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 for total green purchasing is no longer being reported.

Total sustainable food: Includes purchases that are locally grown, organic, fair trade, or humane from all reporting parties on campus.

Population: Includes students, faculty, and staff. Faculty and staff are in full-time equivalent (FTE). Weighted campus user (which is used for per capita calculations for water and waste) formula changed to use FTE rather than headcount for faculty and staff.

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.

Research: Research dollar expenditures, in constant 2009 dollars (converted using CPI). Data are fiscal year; 2015 data are preliminary. Source: Personal communications and Controller's Office, Schedule 1-B http://www.ucop.edu/financial-accounting/financial-reports/campus-financial-schedules/

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To find out more about current sustainability efforts on campus, visit sustainability.berkeley.edu, email the Office of Sustainability and Energy at sustainability@berkeley.edu or sign up for the Bright Green News.

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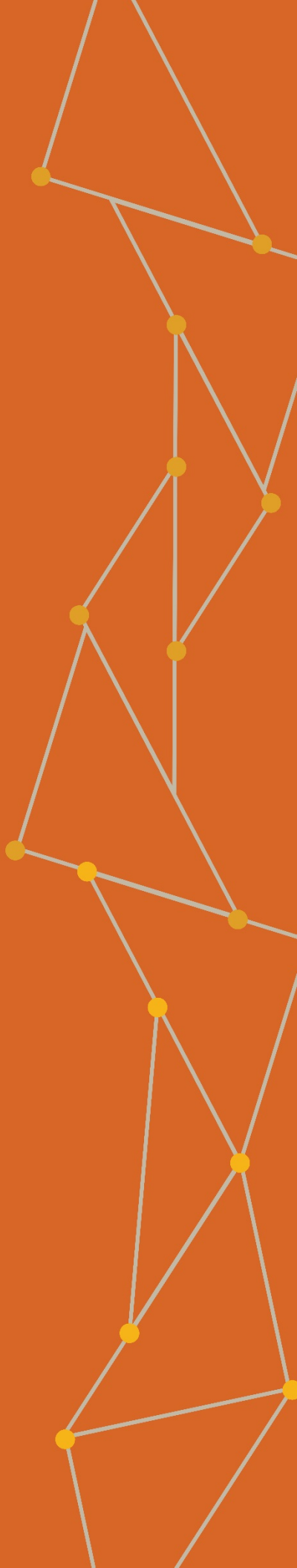

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