

Sustainable Stanford – A Year in Review

August 08- August 09

Program Highlights and Sustainability in the News



Sustainability is a core value at Stanford – demonstrated in academics, operations, communications, and events. This is a quick and chronological snapshot of various activities and accomplishments in the arena by various academic and operational departments. Some of them are big initiatives, others are small. Some programs are for long term implementation, others meet a timely need. However, all activities are strategic, inclusive, and collaborative parts of the integrated and flourishing culture of sustainability at Stanford.

August 9, 2008: Community event - Plant donation from Serra Complex

Sustainable Stanford and Community Relations hosted a small event on August 9, 2008 to salvage small plants/shrubs from the 655 & 651 Serra complex/site prior to scheduled demolition (construction site for the New LEED platinum Graduate School of Business). Community partnership groups included the Sequoia YMCA of Redwood City and the El Camino YMCA of Mountain View, along with Stanford employee members and their families. The day started with a short overview of the purpose of the effort and waiver forms were signed by each participant. The weather was very pleasant and everyone was in great spirits.

Community



Jim Jensen, left, and Danielle DeGroot, middle, salvaged plants on August 9th from 655 and 651 Serra Street, with the aim of reusing them at Sequoia YMCA in Redwood City. Fahmida Ahmed, right, manager of sustainability programs at Stanford, gave them a hand.

August 27, 2008: Y2E2 Docent Program launched

Since its dedication in March 2008, Y2E2 has been a popular tour site for students, researchers, corporate executives, policy makers, and donors as a landmark of sustainability in building design. Jeff Koseff, Professor of Civil & Environmental Engineering and Co-Director of the Woods Institute for the Environment, and Fahmida Ahmed, manager of sustainability programs at Stanford, developed a docent training program that focuses on the building's history, design, and functions. Docents also come away with a better understanding of sustainability and how it is manifested at the Stanford campus. Since August, the docents have completed over 30 tours for regular visits, as well as special events.

Green Buildings, Outreach, Community



Y2E2 west side entrance



Y2E2 Conference Room

August 2008: Sustainability at the School of Medicine

A Sustainability Steering Committee (SSC) was convened in the Summer of 2008 to push forward our efforts in this critical area and to create the momentum needed to engage every member of the School to do what they can towards making us—and our community—more sustainable. The SSC includes students, staff, and faculty members; its focus is to promote a culture of individual responsibility for sustainability within the school by engaging the entire SOM community and working collaboratively with the Hospitals. The SSC has also spearheaded the formation of department “Green Teams” and a website (<http://med.stanford.edu/sustainability/>) to assist departments in reducing their carbon footprint and contributing to the SOM’s sustainability efforts. The School has already been very active in sustainability projects, particularly within the Offices of Facilities Planning and Management and Information Resources and Technology. Some recent accomplishments include:

- Achieving majority participation in BigFix (Computer Power and Patch Management)
- Significant reductions in water use over the few years (more than 26 million gallons saved annually)
- Sustainability elements in the design, construction and retrofit of our buildings
- Significant (and on-going) lighting efficiency improvements
- Hiring a sustainability intern

Additional projects include the sample storage effort, which will reduce the number and improve the efficiency of the many -80 freezers at the School; and the trip reduction efforts that were begun to comply with GUP requirements; label reminders to reduce our carbon footprint from a change in our behavior; compost collection in SOM kitchenettes, break rooms, and cafés.

Community



SSM Website with Green Action Tips

August 2008 – Parking & Transportation Services featured on the cover of *TDM Review*

Stanford University's Parking & Transportation Services' Transportation Demand Management Program was the cover story in the Association for Commuter Transportation magazine *TDM Review*, Issue 2 – 2008. The editor writes that the issue "features insights from some of the leading university TDM programs in the United States and Canada, including Stanford University . . ." The feature provided an overview of Stanford's TDM program, the university's success in achieving a decrease in drive-alone commutes by 20 percentage points between 2002 and 2007, and an increase in Commute Club membership by 82 percent (those using alternative transportation instead of purchasing a parking permit). The article also covered trip reduction goals, the university's biodiesel shuttle fleet, free transit passes, bicycle facilities and education programs, the car sharing program, incentive programs, and measurements of success. For the full story, see the P&TS website at http://transportation.stanford.edu/alt_transportation/Programs.shtml.

Transportation



Cover of Issue 2 - 2008

September 3, 2008: New Sustainable Stanford Website Launched

A new website on Stanford's Sustainability Initiative was launched to inform the internal and external community of Stanford's initiatives, progress, and ongoing programs. This website portrays all aspects of sustainability on campus, with discussion on the visions, goals, and results to date. The website URL is <http://sustainable.stanford.edu>. The page is accessible from Stanford's primary website <http://www.stanford.edu> at the bottom middle section.

Communication



Sustainable Stanford website snapshot

September 10, 2008: President Hennessy outlines green building Plans

As Stanford moves forward with large-scale construction projects across campus, energy efficiency will be planned into the buildings at every step. University President John Hennessy spoke at "Meeting the Demand for Sustainable Buildings," a roundtable co-sponsored by Stanford's Center for Integrated Facility Engineering (CIFE) and the University of California-Berkeley's Fisher Information Technology Center. There, he pointed out that while the public may think of energy efficiency in terms of gas-saving small cars, buildings are actually the big kids on the block when it comes to energy consumption. Over the next five or six years, Stanford will spend \$250 million to \$300 million per year on buildings. A number of older buildings on campus have already undergone energy retrofits. In seven of the ten buildings, the retrofits reduced energy use so drastically that the projects paid for themselves in two years. Full story at:

<http://news.stanford.edu/news/2008/september10/hennessy-091008.html>.

Green Buildings



John Hennessy, left, addressed a roundtable on sustainable buildings. Stanford Professor Martin Fischer, right, also spoke at the event. This was held at the Jerry Yang and Akiko Yamazaki Environment and Energy Building.

September 10, Stanford Graduate School of Business (seeking LEED Platinum) starts Construction

Whether they reveled in person or tuned in remotely from afar, more than 500 people celebrated the start of construction of the new home of the Stanford Business School during an Oct. 10 bash, held under a massive party tent pitched on the Serra Street construction site. The late afternoon event included remarks by Dean Robert Joss, and others, about the significance of the 360,000-square foot, 12-acre, environmentally sustainable campus, which will be named the Knight Management Center after major benefactor Phil Knight. The founder and chairman of sports business Nike Inc., Knight (MBA '62) donated \$105 million toward construction. The School is seeking a LEED® Platinum rating for the design of the new Knight Management Center, which is the **highest level of certification** currently offered by the LEED® Green Building Rating System from the U.S. Green Building Council. More at:

http://www.gsb.stanford.edu/news/headlines/gsb_campus.html

Green Buildings



Business School Dean Robert Joss, left, attended the groundbreaking ceremony with Philip Knight of Nike Inc., center, and Provost John Etchemendy.

September 15, 2008: Labs 21 Conference features Y2E2 Tour

Sustainable Stanford and Woods Institute hosted a green building event on September 15 for the national Labs 21 annual conference. The event hosted close to 250 people with tours of the Y2E2 building as well as the nearby Carnegie Institute building. The presentations included welcome remarks by Joe Stagner, Executive Director of Sustainability and Energy Management; Jeff Koseff, Co-Director of the Woods Institute and Professor of Civil and Environmental Engineering; Isaac Campbell, Principle, Boora Architects; and Chris Field, Professor of Biology and of Environmental Earth System Science.

Green Buildings, Outreach



Event held at the South end terrace facing the Courtyard

September 17, 2008: President Hennessy's residence goes solar

The official campus home of Stanford President John Hennessy has gone solar. The electric meter for Hoover House now runs backward at times, with the solar panels creating more electricity than the house requires. The 40-kilowatt solar panels, the largest photovoltaic system on campus, were energized earlier this month with the flip of a switch that sent photovoltaic electricity flowing to the house and the PG&E grid. The 252 polycrystalline solar panels, manufactured by Evergreen Solar and installed by REC Solar, are mounted on the flat roof of a partially buried water tank (known as the San Juan Reservoir) near the house. The multiple levels and terraces of the historical house, built by Herbert Hoover and his wife in 1920 (before he became president), make it impractical to place the panels there. The Hoover House now boasts the largest photovoltaic system on campus. The Stanford campus has close to 470 KW total of PV installations and another 200 KW of PV installation in faculty housing.

Energy



Stanford energy engineer Scott Gould, left, talks with Greg Gillette of REC Solar amid the 252 polycrystalline panels mounted on a partially buried water tank (known as the San Juan Reservoir) near Hoover House. The multiple levels of the historic dwelling made placing the panels on top impractical.

September 20, 2008: New student orientation Zero Waste lunch

On the first day of orientation, Stanford Dining and Campus Recycling program hosted a Zero Waste (and all compostable) lunch that incorporated all organic food, compostable kitchenware, and tips about sustainable living and how to engage with the Office of Sustainability (insert) in the box. Students enjoyed a hearty lunch and were introduced to the culture of sustainability at Stanford.

Events, Students



The Zero Waste Lunch Insert

September 23, 2008: Sustainable Stanford launches Student Green Fund

Sustainable Stanford launched the Stanford Student Green Fund, which provides one-time grants for innovative student-driven projects designed to create a more sustainable campus. A total of \$30,000 per academic year was available to fund projects. “We started the fund to enable students to be directly involved in helping Stanford be a more sustainable campus,” says Fahmida Ahmed, manager of sustainability programs. “Our students are a tremendous resource, and they come up with innovative ideas that will not only complement our efforts, but also create more opportunities for ongoing student, staff, and faculty collaboration.” More on http://sustainable.stanford.edu/green_fund.

Students



Green Fund promotional poster created by Students for a Sustainable Stanford

September 24, 2008: Stanford scores top ranking for sustainability in national study

Stanford scored in the top tier of the most recognized nationwide study of sustainability practices on college campuses. Only 15 of the 300 colleges and universities studied—Stanford among them—earned the title “overall college sustainability leader” in this year’s College Sustainability Report Card. The report is released annually by the Sustainable Endowments Institute in Cambridge, Mass. Stanford was also the only California school among the top 15. Other notable schools on the list were Harvard, Columbia, Dartmouth, Penn, and Brown from the Ivy League, plus Colorado and Washington from the West. All the schools in the top 15 received an overall grade of “A-.” <http://news-service.stanford.edu/pr/2008/pr-card-092408.html>

Evaluation



SEI Announcement

October 2009: Sustainable IT Initiative to begin in the Department of Sustainability and Energy Management

The Sustainable IT program began as a joint effort between the Department of Sustainability and Energy Management (SEM) and Information Technology (IT) Services to address sustainability issues for both computer equipment and the energy used to run it. Stanford hosts approximately 35,000 desktop and laptop computers and has roughly 6,000 servers used for administrative and research computing. All of this equipment is a significant source of greenhouse gas emissions, especially if every stage of its production and use lifecycle is accounted for, such as manufacturing, use, and disposal. In addition, approximately 15% of our campus electricity energy use is due to our IT infrastructure. The goal of this effort is to help reduce greenhouse gas emissions caused by computing and information technology-related activities. For more information, visit http://sustainable.stanford.edu/sustainable_IT.

Energy and Information Technology



Stanford hosts approximately 35,000 desktop and laptop computers and has roughly 6,000 servers used for administrative and research computing.

October 6: Sustainable Stanford student town hall begins

Townhall 1: Students and staff gathered at the student town hall meeting to discuss sustainability issues at Stanford and how students can be more involved. Topics included an overview presentation of Sustainable Stanford and the Woods Institute for the Environment. A *project match making session* provided opportunities for students to be a part of projects focusing in different areas of sustainability on campus. Students were also invited get involved with both the Sustainability Working Group and various sustainability working teams.

Townhall 2: March 13, 2009 - Students were provided an overview of the Stanford Energy and Climate Plan, its components, and guiding principles. Students provided feedback on ongoing engagement, which resulted in the weekly student office hours with the Office of Sustainability every Monday afternoon from 3:30 to 5:30 at 340 Bonair Siding on Stanford Campus.

Students



“Every student has a role in the stability of our future. It is this ‘niche’ that grounds our position in what we can do personally for the sustainability of our communities, a niche that begins and evolves here on campus.” — David Geeter II, Co-President, Students for a Sustainable Stanford

October – December 2008: Winter Quarter Conservation Cup

Formerly known as the Energy Bowl & Water Derby, the Conservation Cup is an annual competition put on by Students for a Sustainable Stanford with support from Student Housing. Now in its fifth year, the contest continues its tradition of pitting Stanford residences against each other in a battle to conserve the most water and electricity during winter quarter. By using less electricity and water than they used during the same time period last year, residences can win prizes and bragging rights. Most importantly, residents can help promote sustainable behavior at Stanford through participation in this competition. For more information: <http://sustainability.stanford.edu/ccup2008/conservationcup.html>.

Housing, Students



Announcement and Results for 2009's Conservation Cup Winners

October 9-12, 2008: Reunion Homecoming Goes Green

Recognized as a leader in campus sustainability planning and action, Stanford is committed to achieving sustainability in event planning and execution. In the last few years we have made efforts to make major campus events such as Reunion Homecoming an example of this commitment. In addition to the excellent arrangements Stanford alums have come to expect, in 2008 the planning teams added exciting items to showcase how important and exciting greening events can be. For a description of the efforts, visit:

<http://www.stanfordalumni.org/erc/reunions/rh08greenreunion.html>.

Community, Events



Sustainable Stanford at HR 2008 at the Ford Center



Recycle and compost bins, featuring newer lids and signs, during Homecoming Reunion 2008

October 22, 2008: Parking & Transportation Services presented with a merit award

Stanford's Parking & Transportation Services was presented with an "Excellence in Motion" merit award by the Metropolitan Transportation Commission in Oakland, California, on October 22, 2008. Stanford University was among 11 honorees—which included Caltrans, Muir Woods Shuttle, Safeway Inc., and VTA—and was honored by the commission for improving mobility and creating transportation alternatives for motorists who drive alone. For more information (video):

http://www.mtc.ca.gov/about_mtc/awards/video/2008/02.htm.

Transportation



In attendance at the MTC Awards ceremony: Parking & Transportation Services (standing clockwise): Lisa Kwiatkowski, Jean McCown (Stanford Community Relations), Brodie Hamilton, Angus Davol, Joe Stagner, Ariadne Scott, and Karen Moscone

**November 2008: Stauffer Building (2) retrofit finishes
(part of Whole Building Retrofit Programs)**

In 2008, Stauffer building (2) was retrofitted to convert existing constant volume lab spaces to variable air volume, so that only the amount of air needed for safe ventilation and temperature control is supplied. While the preconstruction energy savings from this retrofit were estimated to be 38%, the actual energy savings was 44% (annually on a btu basis). The PG&E one-time rebate was \$112,000. The project won the 2008-2009 Regional ASHRAE Technology Award. A predecessor and identical project was completed at Stauffer Chemistry Building (1) in June 2007. It led to a 35% drop in electricity use, 43 % cut in steam use and 62% fall in chilled water use. The PG&E Rebate for that project was \$180,000.

Energy



Example of the new phoenix valve (1 for each fume hood), which now allows variable air flow into the lab space

December 2008: Stanford submits Draft Habitat Conservation Plan

Stanford has been working with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA Fisheries) to prepare a Habitat Conservation Plan (HCP). The HCP is a comprehensive conservation program for Stanford's 8,000 acres. The primary goals of the HCP are to stabilize or increase the populations of the protected species and enhance their habitat, which will also benefit local species that share this habitat. These species included in the HCP are the California red-legged frog, steelhead, California tiger salamander, western pond turtle, and San Francisco garter snake. During 2009, Stanford has worked closely with the two federal agencies to finalize a Draft HCP in July 2009, which will be released by the agencies for public review once they have completed their Draft Environmental Impact Statement, potentially in Fall 2009. This is happening in conjunction with the Steelhead Habitat Enhancement Project (which includes the fish ladder), expected to complete in October 2009.

Land



Covered Species: California tiger salamander, Western pond turtle, and many more

December 8, 2009 - Stanford offers Zimride – social networking meets ride sharing

Parking & Transportation Services (P&TS) added a new ride sharing option -- Zimride, a social networking ridesharing service—to its existing carpool program. Unlike traditional carpool matching services, Zimride encourages dynamic ride sharing and incorporates social networking through a Facebook carpool application. The service is available with or without Facebook, and enables users to post one-time trips or ongoing commutes and to limit matches within the Stanford community or broaden the search to the entire Zimride network. Launched in December 2008, there are now more than 2,400 Zimride users at Stanford. Learn more and sign up at <http://zimride.stanford.edu>. For more information and to see a video, see the Stanford Report article at <http://news.stanford.edu/news/2009/april8/zipcar-zimride-stanford-partnership-040809.html>.

Transportation



If you have a question about Zimride, carpooling, or if you would like to request an alternative commute plan, please send an email to commuteclub@stanford.edu or call 650.723.9362. To ride share, go to Website: <http://zimride.com/stanford>.

January 2009: Cardinal Green Newsletter launches

Starting in January, Sustainable Stanford launched Cardinal Green, the campus and community’s source for news on campus sustainability efforts and accomplishments. As the program continues its engagement and builds on that momentum, it aims to establish a variety of communication avenues to keep the Stanford community informed and engaged. The newsletter provides an ongoing forum for sustainability teams and topics, and will be used to promote sustainability activities throughout our community. We aim to solicit and publish content that informs, acknowledges, and energizes sustainability efforts from all the diverse groups at Stanford. All issues can be found at: <http://sustainable.stanford.edu/newsletter>.

Communication



Cardinal Green Publications

January 2009: IT Leadership through EDUCAUSE Constituent Group

Stanford helped launch and currently leads the Sustainable IT Constituent Group, an online forum created by EDUCAUSE, the leading organization for Higher Ed IT professionals. The Group invites IT staff from higher education institutions around the world to discuss opportunities to reduce the green house gas emissions attributed to their IT infrastructure. IT infrastructure includes data centers, server rooms, networks, desktop computers, printers, office equipment and more. Joyce Dickerson, director of sustainable IT in The Department of Sustainability and Energy Management, moderates the online Group and leads the Sustainable IT breakout session at the EDUCAUSE Annual Conference in the Fall.

Energy and Information Technology



Joyce Dickerson, Director, Sustainable IT

January 12, 2009: Stanford Launches \$100 Million Energy Initiative

Recognizing that energy is at the heart of many of the world's tribulations—economic, environmental, and political—Stanford established a \$100 million research institute to focus on energy issues, President John Hennessy told a capacity crowd Monday afternoon in Memorial Auditorium. The \$100 million in new funds will enable the hiring of additional faculty and support new graduate students, and is in addition to the more than \$30 million in annual funding now spent on energy research. The new Precourt Institute for Energy will draw on deep scientific expertise from across the campus and around the world. From the minuscule—materials scientists prying loose more electricity from sunshine through more efficient photovoltaic cells—to the national effort to develop sustainable energy and the global search for ways to reduce atmospheric levels of carbon, the new institute plans to be at the forefront. More at: <http://news-service.stanford.edu/news/2009/january14/pie-011409.html>.

Energy



John Hennessy, left, and Lynn Orr answer questions at the press conference Monday announcing the creation of the Precourt Institute for Energy at Stanford.

January 22: Stanford commits to high efficiency transformers for all new construction and major renovations

Stanford has committed to using higher efficiency power transformers for new construction and building retrofits. Transformers are used to convert the 480 Volt power delivered at the building entrance to the lower 120 Volt power supplied at the building's electrical outlets. A typical building may have as many as half-a-dozen distribution transformers installed in various electrical rooms. Since transformers lose power in the conversion process, the extent of these losses is a measure of a transformer's efficiency. Efficiency increases can have a substantial impact on total building electrical consumption because transformers operate continuously whether plug load electricity is being used or not. Furthermore, because transformers emit wasted electricity as heat, inefficient transformers place a higher burden on a building's cooling system. Stanford is now using high efficiency transformers for all new building projects. The decision was made after a successful renovation project in Sweet Hall, completed in August 2008. Buildings and Grounds Maintenance Zone Management Group partnered with the Department of Project Management to replace an existing transformer on the third floor of Sweet Hall. The energy savings in power and building cooling now pays for the increase in equipment cost in less than 5 years. For more information on the savings estimated for campus, visit http://sustainable.stanford.edu/sites/sem.stanford.edu/files/documents/Stanford_transforming_energy_use_facts.pdf.

Energy



Tai Tran, Zone C Engineer, next to the high efficiency transformer provided by Powersmiths

January 2009: Winter close saves resources

By turning off or reducing heat and ventilation in over one hundred unoccupied buildings, we estimate that the campus (excluding the Medical Center) used 4.7 million pounds of steam and 1.5 million kilowatt-hours of electricity less than it otherwise would have over the 16-day period. This amount of energy represents nearly 900 metric tons of carbon dioxide emissions avoided. After subtracting the amount spent to implement the curtailment, we estimate a net cost savings of \$257,000. This is a 17% improvement over last year, despite the fact that technicians had to turn some equipment back on the night of December 25-26 in order to prevent damage from freezing temperatures. The campus participated in this effort to conserve natural and financial resources.

Energy



Winter closure now happens every year between Fall and Winter quarters at Stanford.

February 2009: Stanford competes in Recyclemania 2009

Once again, Stanford University entered Recyclemania - a nationwide recycling contest among colleges and universities. Last year, Stanford won the Gorilla Prize—out of 178 competitors. The Gorilla Prize is awarded to the campus with the most recycling efforts during the competition, in terms of total pounds recycled. This year Stanford ranked 3rd in the Gorilla Prize—among 293 competitors, and placed in the top 25 in 6 categories. For more information on Stanford's results visit: http://www.recyclemaniacs.org/university_detail08.asp?ID=3687.

Waste



510 schools from all 50 states, the District of Columbia, and Canada took part in 2009. The 4.7 million students and 1.1 million faculty and staff on these campuses collectively recycled or composted just over 69.4 million pounds of waste over ten weeks.



February 2009: Stanford reinvigorates the Environmental Health & Safety (EH&S) Surplus Chemical Redistribution and Recycling Program

Since EH&S implemented this innovative pollution prevention program, it has saved over \$100,000 in chemical purchase and waste disposal costs, saving not just money but the environment as well. EH&S strongly encourages everyone in the Stanford research community to participate in this popular and very effective surplus chemical redistribution program. The program's intent is to redirect unused, unopened reagent chemicals out of Stanford's hazardous waste disposal streams and back into the hands of researchers across the university free of charge. For more information, visit http://www.stanford.edu/dept/EHS/prod/enviro/waste/Waste_FAQs.html

Environmental Health & Safety



Flammable chemicals storage area in EH&S

February 6, 2009: Focus the Nation Event

Members of the Sustainability staff attended the student-organized "Focus the Nation" at Stanford. Despite the rain, many members of the faculty and staff came to show their support for the students and their engagement in campus sustainability and climate action. We came away knowing that a successful year in sustainability is achievable with ongoing collaboration between staff and students. This year's Focus the Nation included tabling from ten of Stanford's student groups, open forum discussions, musical performances and coalition building.

Students, Events



Lauren Finzer and Daniela Uribe, members of Students for Sustainable Stanford, at the Sustainable Stanford table (Focus the Nation event, February 6, 2009)



Organic Produce Stand for the guests at the event

February 15, 2009: Sustainability at Stanford: Mandate or Mantra?

Stanford's sustainability was the cover story for the February 09 issue of *Sustainability: the Journal of Record*. The interviews were conducted in November 2008. It covers Stanford's program philosophy, key partnerships, and academic integration and student programs. It also features Stanford's Transportation Demand Management Program. For the full story:

http://sustainable.stanford.edu/sites/sem.stanford.edu/files/documents/S tanford_journal_feb_2009.pdf.

Community, Publication



Sustainability: The Journal of Record February 2009, On the cover is Joe Stagner, Executive Director of the Department of Sustainability and Energy Management.

March 2009: Reclaimed Water Plant

In early 2009, recycled water from a new recycled water treatment plant at Stanford's Central Energy Facility began flowing to the new Yang and Yamazaki Environment and Energy (Y2E2) Building, for use in flushing toilets and for other non-potable needs. The CEF Recycled Water Treatment Plant intercepts cooling tower blow-down wastewater, and treats it for reuse through microfiltration and disinfection processes. Upcoming new buildings will also use recycled water, decreasing the new buildings' demand for domestic water. For more information, visit http://lbre.stanford.edu/sem/Water_Resources.

Water



Reclaimed water plant located inside Central Energy Facility

March 2009 : Conversion to lake water (Escondido Village)

In the past year, as part of a landscape renovation project in a large portion of its 75-acre graduate student housing area, Stanford converted the landscape irrigation from domestic water to “lake” (non-potable) water, preserving its domestic water supply for new campus buildings rather than increasing total campus potable water demand. For more information, visit http://lbre.stanford.edu/sem/Water_Resources.

Water



Landscape area—part of the conversion located in Escondido Village



Courtyard area located inside Escondido Village

March 5, 2009: Stanford Athletics Reuse-A-Shoe Event

Stanford Athletics held its first ever Recycling Night at the Stanford vs. Arizona Women’s Basketball game on March 5th. During this event, Stanford Athletics collected over 200 pairs of shoes to donate to the Nike Reuse-A-Shoe Program. The program, which started collecting gym shoes globally in 1990, partners with organizations to collect old gym shoes, which are then ‘sliced-and-grinded’ into three slices of reusable materials: rubber, foam, and cushioning pads. From running tracks to basketball and tennis courts to playground surfaces and even synthetic turf for soccer and football fields, old athletic shoes and footwear manufacturing scraps can become new places to play – instead of landfill waste.

Waste and Recycling



March 13, 2009: Association for the Advancement of Sustainability in Higher Education (AASHE) Covers Sustainable Stanford with an Interview with the Office of Sustainability

In March, AASHE interviewed and published topics related to Sustainable Stanford and general issues on campus sustainability. The feature focused on institutionalizing sustainability and key principles and practices across all colleges and universities in the nation. The office also participated in launching a Climate Action Wiki through AASHE's publications. More at: <http://www.aashe.org/blog/aashe-interview-series-fahmida-ahmed-stanford-university>.

Community, Publication



AASHE Interview Series, launched in Jan 2009, covered Stanford in March via interview with Fahmida Ahmed, manager of sustainability programs (upper left corner)

March 23, 2009: Water conservation effort wins Silicon Valley Water Conservation Award

Stanford Utilities received the 2009 Silicon Valley Water Conservation Award on March 23rd. This award honors outstanding achievements in water conservation among businesses, local governments, organizations, and individuals in the Silicon Valley region. Recognizing the primacy of water issues to the health, environment and economic vitality of our region, the Silicon Valley Water Conservation Awards are presented to organizations, agencies, businesses, and individuals whose programs and leadership have advanced water conservation in Silicon Valley. (Source: <http://www.waterawards.org/>). To learn more about the Stanford Utilities Division, visit: <http://lbre.stanford.edu/sem/utilities_mission.

Water



Photo from left to right: Nicole Sandkulla, P.E. BAWSCA Senior Water Resources Engineer, Marty Laporte, Associate Director of Utilities for Water Resources & Environmental Quality, and Mike Goff, Director of Utilities

April 2009: Stanford ramps up outdoor recycling

A new pilot program to improve outdoor recycling began implementation in Fall 2008. By the end of Summer 2009, one hundred receptacles will be installed in high use areas of campus. These custom- built split bins are the product of a year's worth of research and collaboration between the University Architect / Campus Planning & Design office, Peninsula Sanitary Services Inc. (PSSI), Stanford Facilities Operations Machine Shop, and other vendors. The bins feature two semi-circular interior liners that each capture a different type of recyclable (or "resource" as Julie Muir, Recycling Manager from PSSI refers to them). "The goal is to eventually pair every exterior trash container with a dual function recycle bin so that anytime one approaches a trash receptacle, within an arm's reach there will always be three to four options," said Cathy Blake, the initiator of the program and Manager of the Campus Stanford Infrastructure Program (SIP-C), that is funding the pilot project. For additional information, contact Eva Rose Leavitt in the University Architect / Campus Planning & Design office at eval@stanford.edu.

Waste



Each furnishing is designed to collect paper along with glass, cans, and plastic containers.

April 3, 2009: Produce Stand re-Opens for 2009

On April 3, 2009, the Stanford Produce Stand re-opened to the Stanford community for its third year. The Produce Stand, a student-run operation sponsored by Stanford Dining, operates every Friday from 11 am to 3 pm during the Spring, Summer, and Fall quarters and is located in the front courtyard at Tressider Union. The idea of the produce stand is to provide affordable, local and organic food to the Stanford community and to educate the community about the importance of local foods available on campus. "It is a great opportunity to educate and connect with the Stanford community about the dining hall gardens and other sustainable food programs within Stanford Dining and Stanford Hospitality & Auxiliaries," said Erin Gaines, Sustainable Foods Coordinator with Stanford Dining and Stanford Hospitality. "It provides 'a student face' to our outreach programs."

Food

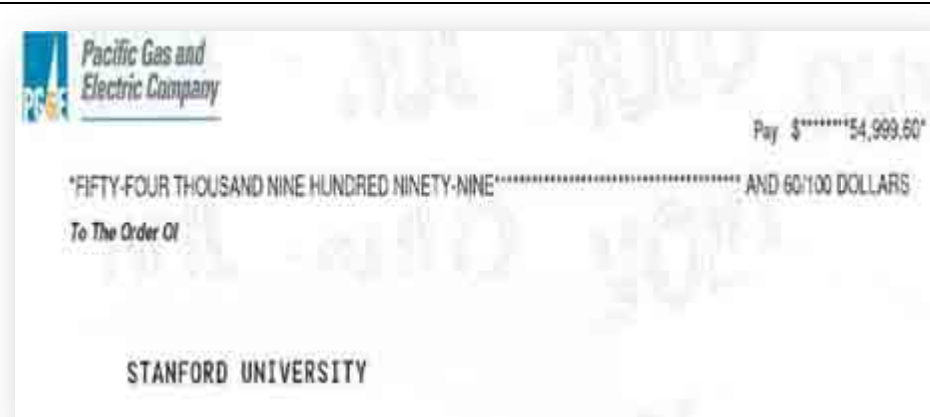


The Produce Stand on opening day, Sample of fresh vegetables on at the Produce Stand

April 6, 2009: Stanford receives \$55k rebate from PG&E

Thanks to the technology of Big Fix Power Management, and the participation of dozens of schools & departments, monitors across campus are being set to turn off after 15 minutes. In addition to saving energy, Stanford received a \$54,999 energy-saving rebate from PG&E earlier this year. The funds will soon be distributed proportionately to 33 schools & departments based on the number of Big Fix Power Management clients. The highest rebate went to the School of Medicine, which received \$28,991 for the 4,149 power management clients they had deployed as of December 2008. GSB received \$6,371, Land and Buildings \$3,347, Alumni Center \$2,648, and IT Services \$2,424. Those receiving the rebates are being encouraged to apply the funds to other green IT efforts, such as purchasing Smart Strips to reduce phantom power or replacing CRTs with flat-panel monitors. Note: as of July 2009 additional computers have enabled Big Fix Power Management, bringing our total to 9,967 on campus.

Energy and Information Technology



Photocopy of PG&E rebate check

April 7, 2009: the Sustainable Development Study Approved by Santa Clara County.

In December 2008, Stanford completed its Sustainable Development Study (SDS) with Santa Clara County, with a specific chapter on sustainability initiatives in campus. Required by the 2000 General Use Permit for development, this cross-departmental initiative addresses how the University will apply sustainable planning principles as it grows over the long term. The SDS focuses on compact urban development in the Central Campus. The SDS also addresses protection of natural resources and analyzes those areas that might be more/less suitable for future development in the Foothills District in unincorporated portions of the County of Santa Clara. On April 7, after 9 public hearings, SDS was approved or 'deemed adequate' by the Santa Clara board of Supervisors.

Land or Community



All information here: <http://sds.stanford.edu/>.

April 14, 2009: Sustainability at Stanford Event – Denis Hayes

Stanford’s own Denis Hayes (’69), National Coordinator of the first Earth Day, spoke on campus on why he coordinated the first Earth Day and shared his thoughts on how young leaders can address the key challenges that face us all. Hayes, who served as National Coordinator of the first Earth Day in 1970, is President and Chief Executive Officer of the Bullitt Foundation, which advocates for environmental protection and sustainability practices in the Pacific Northwest. He also directed the National Renewable Energy Laboratory in President Jimmy Carter’s administration. The event is sponsored by the Woods Institute for the Environment at Stanford, Sustainable Stanford, and Students for a Sustainable Stanford. For more info, visit http://sustainable.stanford.edu/sustainability_event.

Community



Denis Hayes speaking to the audience at Meyer Lawn, April 14, 2009

April 22: Stanford Celebrated Greenfest

On April 22, the Stanford Community celebrated Earth Day at White Plaza, at an event appropriately named “Greenfest”. The festivities were coordinated by Students for a Sustainable Stanford members Molly Oshun (2010) and Alex Luisi (2011). A mixture of “interactive” tables included a drinking water taste test (Utilities Division), “pin where you live” map and color to match the mode of transportation used to commute (Parking & Transportation Services), smoothie-making blender bike (courtesy of Rock the Bike in Berkeley and ingredients provided by Jamba Juice), and Stanford’s very own produce stand. “I think Greenfest has demonstrated the awesome power of coalition building”, says Molly Oshun, Stanford student and Greenfest organizer, “Through collaboration with numerous student and staff groups, SSS was able to generate enough funding and support to bring Majora Carter to campus, host our first ever Sustainable Fashion Show, and build our passion for activism at Sunday’s workshop. <http://sustainability.stanford.edu/>.

Event



Stanford Greenfest at White Plaza, April 22, 2009

April 22, 2009: Stanford wins the AFPA Award

Stanford was the recipient of the 2009 American Forest and Paper Association (AF&PA) College/University Recycling Award. The award was presented at Greenfest on April 22, 2009, the day Stanford Community celebrated Earth Day at White Plaza. With a student population of more than 17,350, the Stanford campus community recovered nearly 3,000 tons of paper for recycling in 2008. On-line outreach, promotional materials, staff presentations, and personal contact are all integral to the education of students and staff about the paper recycling program. The pay-off for the University included the avoidance of more than \$130,000 in landfill fees in 2008. For more information, visit <http://www.afandpa.org/pressreleases.aspx?id=782>.

Waste

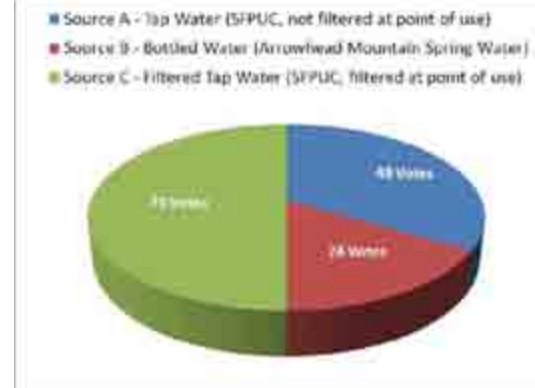


Julie Muir (left) and Ted Tucholski (right) accepting the AF&PA Award presented by Jim Howell (middle), Smurfit Recycling’s West Area Procurement Manager.

April 22, 2009: Drinking water taste test at Greenfest

During the Greenfest event, the Utilities Division featured a water taste test. Three unmarked containers were offered that contained drinking water from three different water sources: SFPUC filtered tap water, SFPUC tap water, and bottled water. Participants were asked to taste each one individually, mark their favorite, and write “tasting” notes for their own reference. A total of 146 participants completed the taste test. When the results were tabulated, the SFPUC filtered tap water was clearly the favorite (see graph). The taste test event highlighted the differences in water quality, costs between tap and bottled water, and environmental impact. The results are being widely shared for campus awareness.

Water



Water Taste test results. Source: Utilities Division

April 2009: Sustainability at Stanford featured on Local TV Channel KTSF

Every Monday, KTSF News (Channel 26) features a Green Report produced by Jessie Liang, whose main focus is environmental pollution and global warming issues. During Spring Quarter of 2009, KTSF completed a series of interviews at Stanford Campus covering different areas of sustainability efforts at Stanford. Thanks to the many participants who provided interviews, Jessie Liang and her news crew were able to cover six topics, including alternative transportation, green dining, and Jasper Ridge Biological Preserve. The news reports were aired in Cantonese and Mandarin. Links to this footage are available in the Cardinal Green June Newsletter:

http://sustainable.stanford.edu/sites/sustainable.stanford.edu/files/documents/Sustainable_Stanford_June_09_Newsletter.pdf.

Outreach



KTSF 'Green Report' segment reporter Jessie Liang

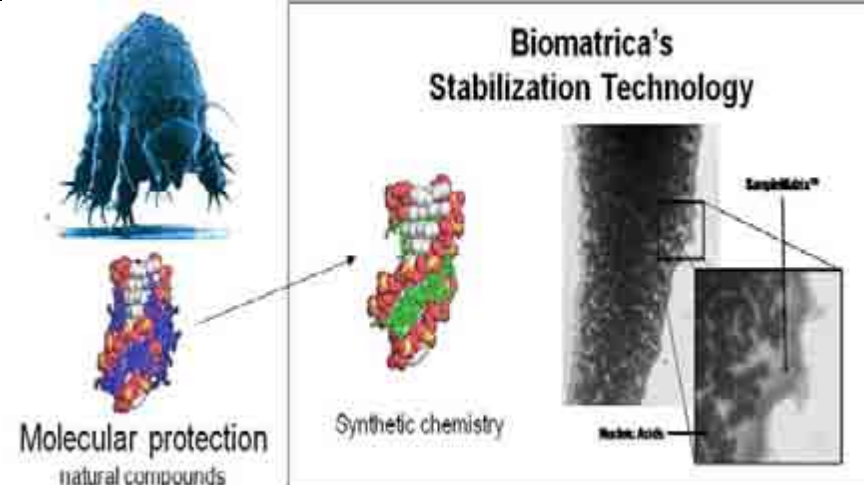
May 1, 2009: Stanford finishes room Temperature Storage Pilot Project

Topic: Energy

Stanford University could substantially cut its energy usage in labs by transferring biological samples from frozen storage to room temperature storage technology. Hundreds of scientific freezers across campus are needed to safely store the current sample collection consuming large amounts of energy, precious research dollars, and valuable space. Stanford recently commissioned and completed a pilot project to estimate potential benefits of room temperature sample storage using a new technology. Stanford supplied reagents and materials to twelve pilot laboratories from the School of Medicine and Biology Department. The pilot demonstrated that an estimated nine to thirteen million samples (representing 20-25% of the total Stanford sample collection) could be moved from freezers to room temperature storage. Final report on:

http://sustainable.stanford.edu/sites/sem.stanford.edu/files/documents/Stanford_Room_Temp_Pilot_May09.pdf.

Energy



The initial investment in transferring these samples could be recovered within three to five years under a broad implementation program.

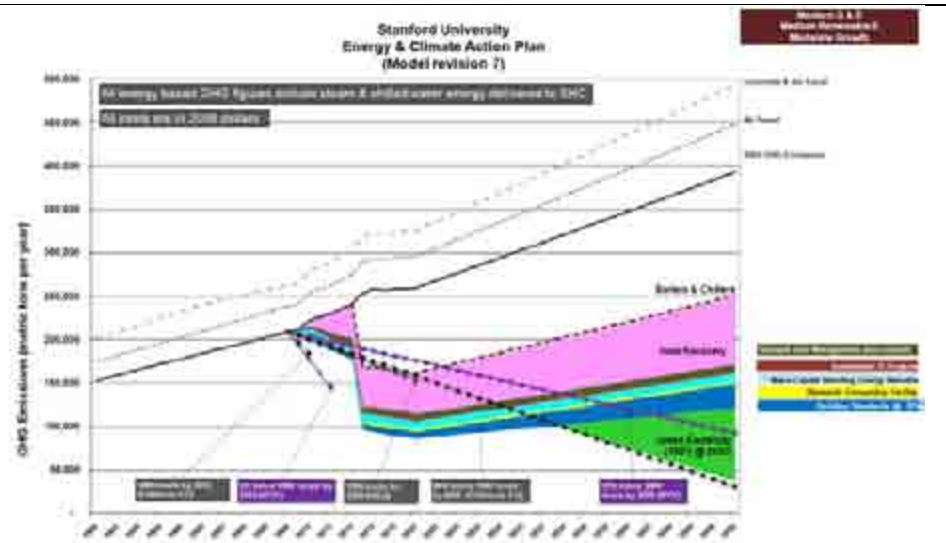
May 1, 2009: Internal publication of Stanford's Long Range Energy and Climate Plan

Stanford has employed natural gas-fired cogeneration for its energy supply since 1989. In May 2009, Land, Buildings and Real Estate (LBRE) submitted a comprehensive Long Range Energy & Climate Plan to the president and provost. The proposed plan culminates a year of intensive effort by the Department of Sustainability and Energy Management in LBRE, in collaboration with other units and expert faculty, and it includes peer reviews by two separate professional consultants. This ambitious proposal calls for achieving aggressive new efficiency standards set in 2007 for our upcoming new building projects; continuance and expansion of major energy conservation programs for our existing buildings; and significant changes in campus energy supply.

Most notably the plan proposes to replace the current cogeneration plant with an innovative 'regeneration' plant that will capture free waste heat from the environment, along with conversion of the entire campus steam distribution system to a hot water system. This ambitious proposal will require significant up front capital investment and could take from 5 to 10 years to implement, but promises very significant long term cost, GHG, and water use reductions for the university.

This in-depth plan is now under review by campus executive leadership.

Energy and Climate



A snapshot of the Emissions Reduction wedges from the *Long Range Energy & Climate Plan* - submitted to the President-Provost in May 2009 – one that would achieve an 80% GHG reduction from 2000 levels by year 2050 (IPCC goal) and save an estimated \$600 million (20% of energy budget).

May 28, 2009, Stanford Magazine launches SAGE, an online eco-advice column

Get answers to your sustainability questions from SAGE, Sound Advice for Green Earth. Students from environmental communications course IPER 200 answer questions on a wide range of topics, from sustainable winemaking to energy-efficient laptops. SAGE is a joint project of the School of Earth Sciences, the Emmett Interdisciplinary Program in the Environment and Resources (E-IPER) and the Woods Institute.

Read more here: <http://www.stanfordalumni.org/news/magazine/sage/>.

Community, Student



SAGE website: <http://www.stanfordalumni.org/news/magazine/sage/>

May 30, 2009: Building Level Sustainability at Stanford:

First pilot completed at Building 170 – An Inspiring Success

In Spring 2009, SWG member Tom Fenner partnered with the Office of Sustainability to initiate a pilot project to assess and quantify the potential benefits of individual actions on resource conservation at the building level. He became the lead volunteer for the Green 170 pilot project for Building 170 and recruited representatives from the other departments in that building to join in the pilot. Building 170 is a four-floor administrative office building in Stanford's Main Quad (01-170). It is home to Public Affairs, the Provost's Budget and Faculty Affairs offices, and the Office of the General Counsel. The pilot program consisted of a combination of deploying desktop power management, installing smart power strips and timers, decommissioning unnecessary equipment, and turning off unneeded lighting to reduce the building's electricity consumption by over 20% during a three-month period, with an estimated return on investment of less than a year.

This inaugural pilot's success and best practices have inspired additional pilots to be conducted in other buildings this Summer and Fall. The pilot has shown that meaningful conservation by occupants is possible and that



Green Building 170 Coordinator Tom Fenner demonstrating timer use in a supplemental computer station located in Bldg 170 kitchen

the results help the bottom line as well as complement building-level efficiency improvements. In coming years, Sustainable Stanford anticipates well-identified and implementable projects such as this to play an important role in the portfolio of resource conservation mechanisms and sustainability at Stanford. Indeed, this program is expected to join a larger Green Building Program/Rating System for Existing Buildings to be implemented in the coming years. For more information on future pilots or Building Level Sustainability Programs, contact Fahmida Ahmed at the Office of Sustainability.

Green Buildings, Community

Hollatic Sustainability Rating for Existing Buildings
(by sustainability attributes, grouped by type, system, department, and other factors)



Building Level Sustainability – concept

June 3, 2009 -- Parking & Transportation Services wins "2009 Innovative Transportation Solutions Award"

On June 3, 2009, the Bay Area Chapter of the Women’s Transportation Seminar (WTS) presented Stanford University's Parking & Transportation Services with the 2009 Innovative Transportation Solutions Award.

The award recognized Stanford University as one of the most effective university programs in the country, which resulted in reduced employee drive-alone rates at Stanford from 72 percent to 52 percent since 2002, which the WTS called "a phenomenal feat."

Transportation



Photo of WTS 2009 Innovation Award

June 9, 2009: Stanford Commencement Weekend goes Green

Stanford's Commencement Weekend, the largest of the "big-five" events at Stanford, attracts thousands of people to campus each year. As part of our campus-wide commitment to sustainability, Stanford Events, Sustainable Stanford, Buildings and Grounds Maintenance, PSSI, Event and Labor Services, and the academic departments and programs at Stanford worked to integrate "Green" practices into every step of the planning and implementation of the weekend's celebrations. For more information: <http://commencement.stanford.edu/green/>.

Events

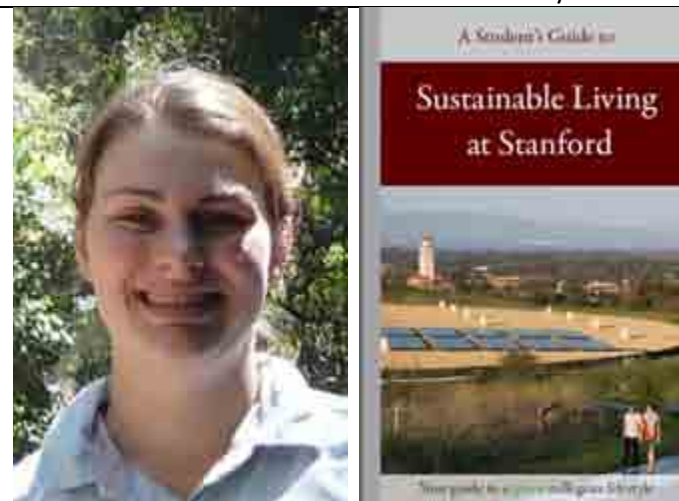


Stanford Commencement ceremony

June 2009: A Student's Guide to Sustainable Living is Crafted

Sustainable Stanford has produced a new booklet titled "A Student's Guide to Sustainable Living at Stanford". Heather Benz (2010), an intern with Sustainable Stanford, is the lead author. The guide is a collaborative effort between students, faculty, and staff from many departments across Stanford's campus. It provides practical tips for how students can reduce their environmental impact, as well as giving information about Stanford's current sustainability efforts. The guide will be sent to class of 2013 incoming freshmen in an electronic format, as part of their *Approaching Stanford* materials. It will also be available on the Sustainable Stanford website in Fall 2009. Be sure to check back soon for availability! <http://sustainable.stanford.edu/students>.

Students



Office of Sustainability Student Intern Heather Benz, 2010

June 22-24, 2009: Stanford at California Higher Education Annual Conference at UC Santa Barbara

Stanford actively participated in the 8th annual University of California/California State Universities/California Community Colleges/Others yearly summit. Stanford presented at 6 forums [preconference workshop for sustainability officers, Lifecycle costing for new construction, room temperature storage pilot, institutionalizing sustainability -moderator, key features in sustainability plans – moderator & closing plenary]. Presentations available at:

<http://sustainability.ucsb.edu/conference/track-sessions.php>.

Communication, Publication



Sustainability Professionals Workshop at Santa Barbara, Group Photo

June 29, 2009: Precourt Institute and Silicon Valley Leadership Council host Energy Summit at Stanford

Over 500 participants joined industry and policy experts for an interactive day of educational and engaging discussions and presentations in energy leadership. This annual event convenes experts from academia, government, and industry to share timely and critical information with attendees. The keynote was delivered by Condoleezza Rice, former Secretary of State and now a Senior Fellow on Public Policy at the Hoover Institute.

Energy



July 9, 2009: Stanford uses high efficiency filter and rack system for all major air conditioning upgrades

Stanford has committed to installing higher efficiency filter and rack system for all major air conditioning upgrades. This filter and rack system is used on air handling units to reduce the indoor air pollution and provide a healthier work environment. This new system will provide better filtration (95% versus 80%) and is more energy efficient with lower static pressure drop and twice longer life of the filter. Most of the air conditioning units on campus will be retrofitted with this new system as they are being upgraded by Building and Grounds Maintenance. Stanford Facilities Design Guideline was updated to reflect the recommendation of this system on all new building projects. The energy savings in electricity pays for the increase in equipment cost in less than five years.

Energy



Durand Filter Racks Replacement

July 11, 2009: Environmental Health and Safety receives three awards from the Campus Safety, Health and Environmental Management Association (CSHEMA)

In June, Stanford EH&S won 3 separate awards from CSHEMA

- Complete Environmental Health and Safety Award of Honor (Their highest award) – 2009 (see attached for description, borrowed heavily from CSHEMA materials)
- Award of Recognition- Unique and Innovative Safety Program- 2004; for our on-line EH&S training program (SafetyTrain)
- Home Page Award – Safety and Health Web Page – 2003

Complete Environmental Health and Safety Award of Honor is the highest award bestowed by CSHEMA. Each applicant must answer a variety of questions about their programs, providing concrete substantiation of all programmatic elements including novel and/or original efforts and compliance with all regulations.

Environmental Health & Safety



Environmental Health & Safety Associate Vice Provost Larry Gibbs receiving the Award of Honor in New Orleans

Ongoing: Science and Engineering Quad (SEQ) construction

The Jerry Yang and Akiko Yamazaki Environment and Energy Building (Y2E2), is the first of four buildings that will make up the Science and Engineering Quad (SEQ). The University has committed that the remaining three buildings in this 500,000 square foot development will likewise be built (as Stanford President John Hennessy this year told the Faculty Senate) “to the same level of environmental standards [as Y2E2], so that we can become a leader not only in research, but in the practice of building new facilities.” Similarly, former Stanford Board of Trustees Chair Burt McMurtry lauded Y2E2 as a “model for what we should be thinking about for practically all of our construction” in terms of environmentally sustainable buildings.

<http://news.stanford.edu/news/2005/february9/seq-020905.html>

Green Buildings



Ongoing construction at SEQ in July 09



The Plan for SEQ

Ongoing: Waste audits

Stanford University has completed eleven waste sorting audit in 2008-2009. The program chose dumpsters from across the campus to learn more about our waste disposal practices. The purpose is to characterize the waste that we are sending to the landfill to see where we need to improve or expand waste reduction, recycling, and composting programs. These audits have allowed us to develop useful and interesting data on the waste stream that will allow us to design and implement a Zero Waste Plan for the campus. Additionally, the audits have served as an educational tool. To each of these sorting events, we have invited the building’s staff and faculty, Students for a Sustainable Stanford and other interested staff, faculty, and students. We usually have 10-20 volunteers open bags of trash and sort the material into 12 categories that we then measure and weigh. We provide all personal protective equipment (lab coat, gloves, and goggles) and instructions.

Waste



Typical Waste Audits with students and staff at Bonair Siding Location. A link to the senior seminar videos that were made as a result of the waste audits: <http://sites.google.com/site/stanfordrefuse/>.

Ongoing: Campus Garden Initiative

The Campus Garden Initiative seeks to expand the popular Stanford Dining Hall gardens and Stanford Community Farm programs by providing a system for student residences to establish new gardens. The goal is to expand student educational opportunities and awareness of sustainable food production techniques as well as of whole food nutrition. Three student housing dorms (East house, Hammerskjold, and Kairos) were selected to kick-off the pilot project. The initiative, lead by Sarah Wiederkehr, Sustainable Farm Educator, incorporates both student participation and teaching and research.

Stanford Dining has also pushed forward efforts to incorporate sustainability, local food production, and nutrition into its activities. In particular, the [Dining Hall Gardens](#) have attracted many student gardeners to tend plots adjacent to all dining halls. Each quarter sees more applicants apply for a limited number of gardening positions, and many applicants are from other residences that do not have their own gardens. Dining hall events based on produce from these gardens has attracted wide student interest in campus gardens and enthusiasm for sustainable food production as well. These events are great models to expand upon in all residences on campus.

Much of the land in the central campus area of Leland Stanford's Palo Alto Farm has since been converted to serve non-agricultural purposes, but the potential still remains for agricultural education to grow once more. In recent years, the Community Farm has added wonderful benefits to the Stanford Campus with its one acre of fruit orchards, student and member plots, and frequent educational activities. Due to the popularity of the Community Farm there is currently a waiting list for the plots. Increased garden capacity on campus could help fill this unmet need.

Food



Ricker Dining's organic garden provides herbs and vegetables to the Ricker Dining Hall.



Students at Stanford's Community Farm, 2008

Ongoing: Palo Alto Community Environmental Action

Stanford has been an active member of The Palo Alto Community Environmental Action Partnership (CEAP), a collaborative citywide initiative, which engages the various segments of the Palo Alto community to identify opportunities and create and implement sustainable environmental solutions. Comprised of representatives from the variety of “segments” in the community, including: neighborhood associations, schools, small businesses, large businesses, non-profit organizations, faith-based communities, the medical community, the city government and Stanford, CEAP strives to fight climate change, conserve water, and create a sustainable, vibrant, livable city all. The City of Palo Alto and community groups created the CEAP in accordance with the recommendations made by the City’s Green Ribbon Task Force and the Climate Protection Plan. Through broad community participation, CEAP focuses its efforts on how the community can create 'livable' and 'doable' solutions.

Community



Ongoing: Salvage and re-use of building materials

Building material salvage and re-use has long been a part of operations at Stanford University. A historic example is the Track House, built from bricks salvaged from the foundation of the Old Gym that was destroyed in the 1906 Earthquake. In 2008-9 some building material salvage & re-use efforts included:

- **Faculty Club Bricks** – 5,700-6,000 square feet of bricks became available for re-use as a result of a waterproofing project at the Faculty Club. 25 pallets of bricks (roughly 2700 sq. feet) will be re-used to pave a new courtyard space serving the Crothers Housing Complex residents. Another 22 pallets are being stored for a future expansion of the courtyard. Housing claimed the remaining available bricks to stockpile for use on future projects.
- **Clay Roof Tiles** - 6,800 sq. feet of clay roof tiles became available from the demolition of the Kresge Auditorium. They will be reused on future housing project(s) and the new Mechanical Engineering Building.
- **DAPER Unit Pavers** - 20 pallets of unit pavers from the Avery mall area were re-used both at the BCSC Renovation landscape and at the soon to be opened Automotive Innovation Facility in West Campus.

In 2008-2009 numerous site and landscape elements were salvaged and re-used including: Two picnic tables from the Knight Center site demolition that will be retrofitted and placed at Lake Lagunita, bicycle racks that were relocated to the Porter Drive complex, and cobble stones that were used in five median noses along the newly reconfigured Campus Drive East at crosswalks to define pedestrian refuge areas. Benches, newsracks, ash, trash, recycling cans, light poles, wood from building rafters, trees and other plant materials were also salvaged for relocation and reuse.

Salvage and Reuse



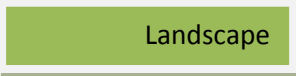
Brick from Faculty Club Salvaged for Crothers Housing

Today, as campus sites are redeveloped, renovated and/or repaired, there is a great effort made to evaluate materials for their reuse. For each project, user and maintenance groups survey materials for re-use opportunities, then demolition contractors assess materials to salvage for their markets. Surplus Property may select items for re-sale as well. Exchanges of materials are often made within the Department of Project Management because of the challenging timing, coordination & storage issues connected with salvage and re-use at Stanford.

Ongoing: Landscape - Tree relocation (part of Vegetation Management Program)

Stanford University has an active Vegetation Management Program which includes campus tree relocation. All trees impacted by construction are evaluated for possible transplanting to other locations, to replace trees that have died, infill areas that would benefit from more shade, screening, or enclosure, or to fill the needs of a newly designed landscape.

Through summer of 2009, Stanford has over seven hundred transplanted trees on campus under the care of the Facilities Grounds department, who monitor their status and ensure that they are maintained and assessed for health issues. A data base of trees transplanted and removed is kept, showing a success rate close to 87%. Among the oldest transplants is a coast live oak moved in 1996, now with a fourteen inch diameter trunk and in excellent health. From 2008-9 construction activities, Stanford is currently maintaining close to forty transplanted trees that originally existed on the now demolished site of the new Knight Management Center School of Business campus. These trees were integrated into the Knight Center landscape design and will be transplanted to become part of the finished landscape. Rhododendrons and magnolia trees from the site were transplanted to a new spot next to Memorial Church to recreate the Amy Blue tribute garden that was displaced by the Knight project. Many other trees from that site were transplanted and have been placed in other areas of the campus. Similarly, the Li Ka Shang Center for Knowledge project salvaged over thirty five trees that are now being planted on their site to complete their new landscape design. The Concert Hall project has begun to relocate impacted trees, and will eventually move a majority of the trees that can't be saved in place.



Both already transplanted and yet to be transplanted (in wooden boxes) olive trees line a block of Campus Drive. Since program inception: Over 700 transplanted trees with 87% survival rate.

Ongoing: The New Stanford Hospital with High Sustainability Goals

Stanford is half way through the Design Development of the new 1.1 million gross square feet Stanford Hospital and it is expected to achieve LEED® Silver equivalency. The sustainable design features at the new Stanford Hospital will demonstrate a triple bottom line approach—combining environmental, economic, and social equity—in support of a high performance, healing environment for patients, staff, and the community. The new hospital location, integrated with community walking, cycling, and transit infrastructure, is a reuse of a previously developed "urban" site without any reduction to open space. It is striving to achieve an EPA ENERGY STAR® score of 90, and will install electricity and water meters to track performance. Features include optimized building envelope, cool roofs - including a vegetated roof, energy efficient ventilation, heating, and cooling systems, including displacement ventilation in patient rooms (if approved by OSHPD), energy and water efficient medical and food service equipment, and water efficient and drought tolerant landscaping. Sustainable construction techniques include on-site reuse of crushed concrete from demolition, and minimum 75% recycling of construction and demolition waste. The hospital is designed to offset emissions associated with the hospital's operations, including research on recycling waste anesthetic gas. The hospital will not only be a healing environment that supports access to the natural environment, but a model for wellness that is integrated with Stanford's cutting edge treatment in the field of medicine. This innovative project is partnering with national research labs to inform the next generation of healthcare construction.

Green Buildings



Garden Level View of the New Hospital



View from Level 3 Courtyard Terrace

Ongoing: Biodegradable composites for the building industry

With the help of a grant from the Woods Institute for the Environment, Stanford researchers have developed a synthetic wood substitute that may one day save trees, reduce greenhouse gas emissions, and shrink landfills. The research team focused on a new class of construction material called biodegradable composites, or “biocomposites,” which are glue-like resins reinforced with natural fibers that are made from plants and recyclable polymers. Unlike wood scraps that can sit in landfills for months or years, hemp-PHB biocomposites decompose a few weeks after burial. As they degrade, they release methane gas that can be captured and burned for energy recovery or reused to make more biocomposites. Interest in the hemp-PHB biocomposites has moved beyond artificial wood products. In 2008, the team was awarded a three-year, \$1.5 million grant from the California Environmental Protection Agency to develop biodegradable plastics to replace the petrochemical plastics that are used to make disposable water and soda bottles.

Research - Green Buildings



Graduate students Aaron Michel and Molly Morse hold samples of the biodegradable wood substitute.
Photo credit: L.A. Cicero / Stanford News Service

Ongoing: Water, Health, and Environment: Childhood Survival in Tanzania

Each year, an estimated 1.8 million people worldwide are killed by diarrhea, which usually results from drinking water contaminated with human feces, coming in contact with a person with poor personal hygiene, or exposure to a contaminated surface. In 2006, a research team headed by Ali Boehm and Jennifer Davis was awarded a grant by the Woods Institute for the Environment to find solutions to the problem of diarrhea-related deaths among children in Africa. In summer 2008, Davis, Boehm, and a team of students and post-graduates traveled to Dar to study 300 households over a 10-week period. The research team hired Tanzanian enumerators to collect behavioral information and test stored water and the hands of family members for indicators of fecal contamination. The research team hired Tanzanian enumerators to collect behavioral information and test stored water and the hands of family members for indicators of fecal contamination. The results could lead to low-cost policy solutions that ultimately reduce the incidence of diarrhea for tens of millions of children in sub-Saharan Africa and throughout the world.

Research – Water



Taking bacteria sample from child's hand in Dares Salaam, Tanzania.
Credit - Amy Janel Pickering, Stanford University

Ongoing: Mitigating Future Arsenic Catastrophes in Asia: An Integrative Study of Processes Controlling Arsenic Release Induced by Land Use

Every day, more than 140 million people in southern Asia drink groundwater contaminated with arsenic and thousands die each year due to chronic arsenic exposure. More than 15 years ago, scientists pinpointed the source of contamination in the Himalaya Mountains, where sediments containing naturally occurring arsenic are carried downstream to heavily populated river basins. But instead of remaining chemically trapped in the river sediments, arsenic was somehow working its way into the groundwater more than 100 feet below the surface. With the help of a grant from the Woods Institute for the Environment, Scott Fendorf and Stanford colleagues, Chris Francis and Karen Seto (now at Yale University) discovered the culprits responsible for dissolving the arsenic turned out to be bacteria that live in the soil and sediments of the river basin. On March 24, 2009, Fendorf co-lead a four-day meeting on arsenic poisoning in Siam Reap, Cambodia, with government officials, scholars, NGOs, and funding agencies, such as the World Bank. Possible solutions range from creating new wells to installing arsenic filters, collecting rainwater, and purifying surface water.

Research – Water



The source of the problem; drawing water from a shallow well, Scott Fendorf, Stanford University



Ben Kocar (graduate student) installing a water sampling device. Photo Credit - Scott Fendorf, Stanford University

Ongoing: Solar Water Delivery in Benin

During the dry season, women and young girls frequently haul water for several hours each day in an attempt to hand-water small plots of vegetables. The Solar Electric Light Fund (SELF) had a better idea: use eco-friendly solar power to pump freshwater to villages. But is solar sustainable in remote rural areas, and will it allow farming to flourish while remaining carbon neutral? To find out, the Woods Institute awarded a grant to Stanford's Food Security and the Environment (FSE) program. SELF installed solar water pumping and drip irrigation systems to provide running water and irrigation to two villages in the Kalalé District of Benin. In summer 2008, at the end of the six-month dry season, FSE determined that the effort had increased the average weekly income and food consumption of households in the area while also representing a more environmentally friendly option than other alternative energy solutions for West Africa. This project will now form a replicable model that can be used throughout the country.

Research - Water, Energy



Villagers assist with the building of solar panel.



The completed solar panel will now provide power to irrigate crops.

Photo Credit: Jennifer Burney, Stanford University