SUSTAINABILITY AT STANFORD

A Year In Review 2011–12

Universities like Stanford have an obligation to educate the sustainability leaders of tomorrow. So we must bring the rigor of academic research to the important choices humanity must make and teach our students to do the same. We also must lead by example and pursue sustainability on our campus.

— John Etchemendy
Provost
Stanford University

Sustainability at Stanford

A Year in Review

2011–12

Welcome

The Office of Sustainability and our campus partners are pleased to present the 2011–12 edition of "Sustainability at Stanford: A Year in Review," which showcases the strides made in campus sustainability during the academic year. This publication summarizes operational, academic, and programmatic highlights, presents metrics and trends, and provides an in-depth review of featured topics.

Sustainability is a core value at Stanford. Integrated into academics, campus operations, communications, and events, sustainability practices are reducing the university's environmental impact, saving resources, and engaging the campus community. This year we are particularly excited to highlight ongoing academic initiatives in sustainability, showing their remarkable breadth and contribution to Stanford as a living laboratory.

Innovation and efficiency drive Stanford's sustainability mission and its implementation, showing consistent improvement in performance despite campus growth. The first half of this report presents featured topics, demonstrating Stanford's commitment to strategic planning and to achieving measureable results. The second half of this report takes a chronological approach, where snapshot stories complement the featured topics and indicate the steady pulse of sustainability at Stanford. Some initiatives are bold and ambitious, while others are grassroots. However, all are strategic and collaborative parts of Stanford's integrated and flourishing culture of sustainability.

Over thirty-five departments and groups from the entire campus community contributed content to this annual report. Together we celebrate our success, and look forward to the journey ahead, with gratitude for all your engagement and goodwill.

Sincerely,

Fahmida Ahmed
Office of Sustainability
Sustainability & Energy Management; Land, Buildings & Real Estate

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Introduction to Featured Topics

Sustainability is a core value at Stanford, and the campus continues to make significant investments in and strides toward sustainability at the operational, academic, and programmatic levels.

Central to the academic endeavor has been the Initiative on the Environment and Sustainability, which boosted interdisciplinary research and teaching in all seven of Stanford's schools, as well as in interdisciplinary institutes, centers, and associated programs across campus, in recognition of the fact that solutions to complex challenges demand collaboration across multiple fields. The School of Earth Sciences, the School of Engineering, the Graduate School of Business (GSB), and the School of Medicine (SOM) are leaders in sustainability research and teaching. Leading institutes such as the Stanford Woods Institute for the Environment (Woods, founded in 2006) and the Precourt Institute for Energy (PIE, founded in 2009) serve as the academic integration points and coordination platforms for interdisciplinary research and programs.

Today, all seven schools offer a wide range of environmental and sustainability-related courses and research opportunities. Over 130 faculty members from 40 departments teach more than 750 courses in this arena, including courses designed by or affiliated with Woods and PIE.

The Department of Sustainability and Energy Management (SEM) within Land, Buildings & Real Estate (LBRE) leads initiatives on campus physical infrastructure and programs in energy and climate, water, transportation, building operations, and information systems. The Office of Sustainability (founded in 2008) connects campus departments and entities and works collaboratively with them to steer sustainability-specific initiatives. The Office works on long-range sustainability analysis and planning, evaluation and reporting, communication and outreach, academic integration, behavior-based programs, and governance coordination.

Critical sustainability partners include Residential & Dining Enterprises (R&DE), which houses its own sustainable food and student housing programs; Stanford Recycling Center (run by Peninsula Sanitary Service, Inc., PSSI); University Communications; Government and Community Relations; the Alumni Association; and over 20 student organizations.

Sustainability is not a spectator sport but an opportunity for collective engagement at Stanford. Stanford's sustainability initiatives, like its other initiatives, follow the principle that actions speak louder than goals. This chapter discusses each major topic in terms of key accomplishments, results and trends, academic integration, and offers some insight into the work ahead.

Here are some of the most significant and unique accomplishments featured in "Sustainability at Stanford: A Year in Review, 2011–12".

- Stanford continues to produce leading interdisciplinary research to develop solutions to the world's most pressing environmental problems. Woods, PIE, and others awarded more than $14 million in 2011–12 to innovative new research projects.
- Stanford received a gold rating from the Association for the Advancement of Sustainability in Higher Education (AASHE) under its Sustainability Tracking, Assessment and Rating System (STARS). STARS is the first comprehensive sustainability performance assessment and national rating system developed by and for leaders in higher education sustainability. Of over 1,100 AASHE members, Stanford became one of just 35 to earn a gold rating, the highest level awarded to date.
- Stanford has committed to transforming its energy system through Stanford Energy System Innovations (SESI), which will reduce greenhouse gas (GHG) emissions by 50% and total campus potable water use by 18%. The Board of Trustees approved this $438 million program in December 2011, and implementation started in summer 2012.
- Stanford reduced domestic water use on campus 21% in 2012 from a 2000 baseline, despite adding more than one million gross square feet (GSF) to the building portfolio.
- The GSB's Knight Management Center received formal LEED for New Construction Platinum certification, the highest rating level awarded by the U.S. Green Building Council (USGBC). The 360,000-square-foot facility integrates sustainability into every aspect of its design and operations.
- The employee drive-alone rate dropped to 47%, down from 72% in 2002 at the inception of the formal Transportation Demand Management (TDM) program. Commute-related emissions remain below 1990 levels. The Commute Club celebrated its 10-year anniversary and now includes 8,000 members, compared to just 3,600 when the program started.

- The award-winning Arrillaga Family Dining Commons opened—the first new campus dining hall in nearly two decades. Besides winning first place in the Montague Suite Dreams Design Challenge, the state-of-the-art dining hall is on the cutting edge with initiatives such as Performance Dining and a learning kitchen designed to bring students closer to their food through curriculum enhancements.
- Stanford's waste and recycling program (run by PSSI) doubled the number of food-waste bins located in graduate housing to make home composting more convenient. A pilot office composting program now includes more than 27 collection points and has diverted more than 750 pounds of food waste per month from the landfill.
- Students continued to galvanize the campus community around environmental issues by organizing a number of different events, such as Sustainable Seafood Month, Environment and War Week, and the Art and Science of Sustainability Colloquium.
- A consortium of senior faculty, staff, and student leaders in campus sustainability worked to develop a strategic plan to expand and enhance sustainability over the next five to ten years. Major goals stemming from this effort, dubbed Sustainability 3.0, include leading by example through on- and off-campus actions and maintaining a global influence through sustainability in research, education, and operations.
- Celebrating Sustainability, the first event focused on sustainability and planned jointly by operational and academic entities, unveiled the common goals, strategies, and actions that will guide sustainability at Stanford in future years.

Sustainability in Campus Operations

The first set of featured topics focuses on the operational milestones and performance achievements during academic year 2011–12.

Since 2000, Stanford has maintained detailed performance records in the key operational areas of energy, greenhouse gas (GHG) emissions, transportation, waste, and water. As the table below shows, the campus has either maintained or lowered consumption per usable square foot (USF) in all areas, despite growth and the addition of nearly one million square feet of high-intensity research laboratory space.

Operational Sustainability Metrics Summary

Metric	Trend	Baseline Year
Total Energy Use	↑ 11%	2000
Total Energy Intensity	↓ 6%	2000
Greenhouse Gas Emissions	↑ 8%	2007*
Greenhouse Gas Intensity	↓ 0.7%	2007*
Landfilled Waste	↓ 30%	2000
Drive-Alone Rate	↓ 25%	2002*
Domestic Water Use	↓ 21%	2000
Domestic Water Intensity	↓ 33%	2000

* Years other than 2000 denote formal program start dates and/or the earliest years for which metrics are available.

The next page provides a more detailed review of operational metrics with annual consumption breakdown starting in 2000, the baseline year for most data.

STANFORD UNIVERSITY OPERATIONAL SUSTAINABILITY METRICS

Sustainability Area	Metrics	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Energy													
Electricity	kwh (in millions)	175.4	175.1	176.3	180.8	186.8	190.3	194.5	198.2	198.9	198.9	206.2	207.8
	kwh/usf [1]	17.4	17.0	16.8	17.2	17.4	17.6	17.8	18.1	18.1	17.6	17.4	17.4
Steam	lbs (in millions)	798.7	847.7	860.5	865.4	878.8	904.4	876.1	858.4	883.5	825.7	848.2	839.0
	lbs/usf	90.6	96.9	98.5	99.1	97.9	99.9	96.2	92.8	95.0	85.8	83.3	82.1
Chilled Water	ton-hr (in millions)	48.0	48.0	49.8	54.3	59.9	55.4	53.5	53.6	56.3	56.2	52.8	55.1
	ton-hr/usf	6.6	6.7	6.9	7.5	7.9	7.1	6.8	6.7	7.0	6.8	5.9	6.2
Greenhouse Gas Emissions													
Publicly Reported Emissions [2]	$MTCO_2$	n/a	n/a	n/a	n/a	n/a	n/a	168,400	182,900	180,700	182,400	195,800	198,300 [3]
Emissions Intensity	lbs of CO_2/gsf [4]	n/a	n/a	n/a	n/a	n/a	n/a	25.53	26.64	26.48	27.48	27.23	26.45
Waste Minimization													
Total Diverted	tons	11,276	11,300	11,587	11,047	13,629	12,668	14,732	13,193	14,686	15,251	14,261	12,814
Total Landfilled	tons	11,495	10,194	10,429	9,533	9,262	9,094	9,558	8,820	8,180	8,384	8,104	7,995
Total Waste Stream	tons	22,771	21,494	22,016	20,580	22,891	21,762	24,290	22,014	22,866	23,635	22,369	20,809
Diversion Rate		50%	53%	53%	54%	60%	58%	61%	60%	64%	65%	64%	62%
Transportation													
Commuter Drive-Alone Rate (employees only)		n/a	n/a	72%	65%	63%	58%	54%	52%	51%	48%	48%	46%
Commuter Drive-Alone Rate (all off-campus commuters)		n/a	n/a	n/a	60%	59%	54%	50%	46%	46%	42%	42%	39%
Food Purchasing													
Sustainable Food Purchases [5]		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	41.9%	43.6%
		00/01	**01/02**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**11/12**
Water													
Domestic	gals (in millions)	997.2	862.8	840.1	921.1	843.1	811.8	832.4	841.8	778.6	780.8	774.7	786.7
	gals/usf	96.1	81.5	77.7	85.0	76.6	73.1	74.4	74.8	69.3	67.4	63.8	64.5
Lake	gals (in millions)	431.4	406.6	362.7	364.2	332.1	270.5	347.2	446.8	378.8	375.2	391.3	430.7

Note:

1. In 2010 Stanford transitioned to USF in lieu of GSF since tracked campus GSF data now include attic areas and other spaces not normally used or conditioned. Thus, USF represents utility service area more accurately, and this table has been revised with USF starting in 2000. Service areas for electricity, steam, chilled water, and domestic water are different, and USF served by electricity and domestic water excludes parking structures.
2. Emissions for 2006–2009 verified per the California Climate Action Registry General Reporting Protocol, including de minimis emissions. Emissions for 2010 verified per the Climate Registry General Reporting Protocol, including simplified estimation (de minimis equivalent) emissions.
3. Emissions for 2011 per the Climate Registry General Reporting Protocol, including simplified estimation (de minimis equivalent) emissions; verification pending.
4. GSF included in the emissions intensity calculation corresponds to the properties included in the emissions inventory as defined by the operational control boundary method.
5. Calculations for sustainable food purchasing by Stanford Dining correspond to the criteria defined by the AASHE STARS program. These include food and beverages grown or processed within 250 miles of campus and/or third-party certified (USDA Certified Organic, Marine Stewardship Council Blue Ecolabel, Food Alliance, Fair Trade, Certified Humane Raised and Handled).

Stanford remains vigilant in analyzing these performance metrics to calibrate operations decisions and management approaches, quantify the impacts of conservation programs, and tailor future initiatives to meet specific campus needs. The topics that follow provide detailed discussions and more specific metrics for each area.

Each topic featured in this report is fundamentally interconnected with other topics, either in planning or in implementation. Hence, the topics are presented with those interconnections and interdependencies in mind and are flagged with related topic icons.

We hope you enjoy all of them.

Stanford Energy System Innovations (SESI) Begins

Background

In December 2011, Stanford's Board of Trustees approved the SESI program, designed to meet the university's future energy needs while reducing greenhouse gas emissions and water consumption. Conceived in the Department of Sustainability and Energy Management (SEM) and in implementation with the Department of Project Management (DPM), Campus Architect's Office, Land Use & Environmental Planning, Zones Management, Building and Grounds Maintenance (BGM), and many other departments, the SESI program is an all-hands Land, Buildings & Real Estate (LBRE) engagement that will deliver immense benefits for Stanford University in decades to come.

Due to the significant overlap between campus heating and cooling demands, a replacement central energy facility (RCEF) will include an innovative heat recovery design that is significantly more efficient than the existing cogeneration process. In the future, heat collected from buildings via the chilled-water loop will be captured for reuse, minimizing the use of conventional chillers to discharge waste heat via cooling towers. Heat recovery chillers will move the heat collected from the chilled-water loop to a new hot-water loop that will replace Stanford's aging steam distribution system.

Benefits

The $438 million project represents a significant transformation of the university energy supply from 100% fossil-fuel-based cogeneration to a more efficient electric heat recovery system. Key benefits of the SESI program are as follows:

- As the RCEF comes online, the campus will reduce its carbon emissions to at least 50% below 1990 levels. Simultaneously, an electricity-dependent energy supply system will offer higher reliability, lower cost, and greater flexibility for green power procurement. Having achieved direct access to the California electricity market in early 2011, Stanford is now developing opportunities for a more economic and environmentally sound power portfolio.

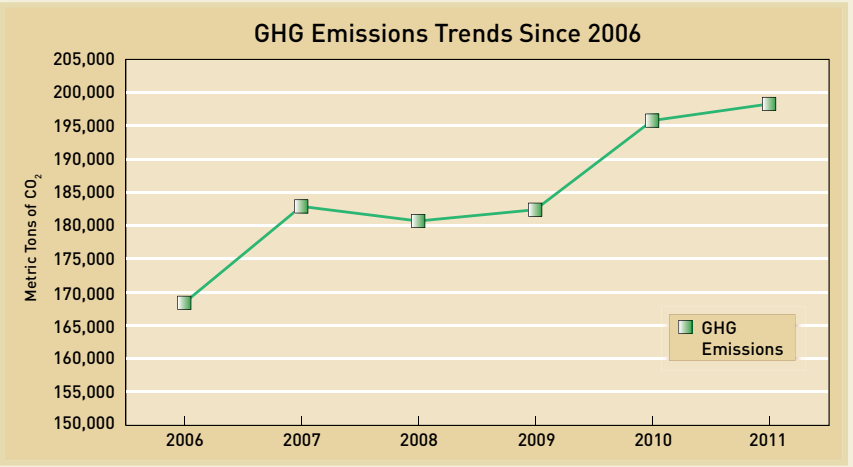
- Due to the significant opportunity for heat recovery, and the lower line losses of hot water compared to steam piping, the new energy system will be 70% more efficient than the combined heat and power process of the current cogeneration facility.
- Since the majority of the waste heat from the chilled-water loop will be reused rather than discharged via evaporative cooling towers, total campus potable water use will be reduced by 18%.
- The SESI program is the best-cost option compared to continuation of the current cogeneration system, with a net additional $100 million capital investment projected to yield $300 million over the next 40 years.

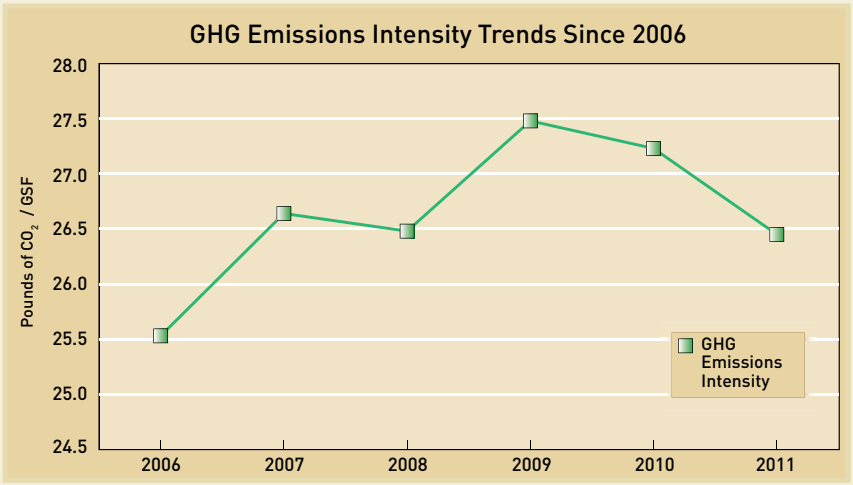
The Road to Carbon Reduction

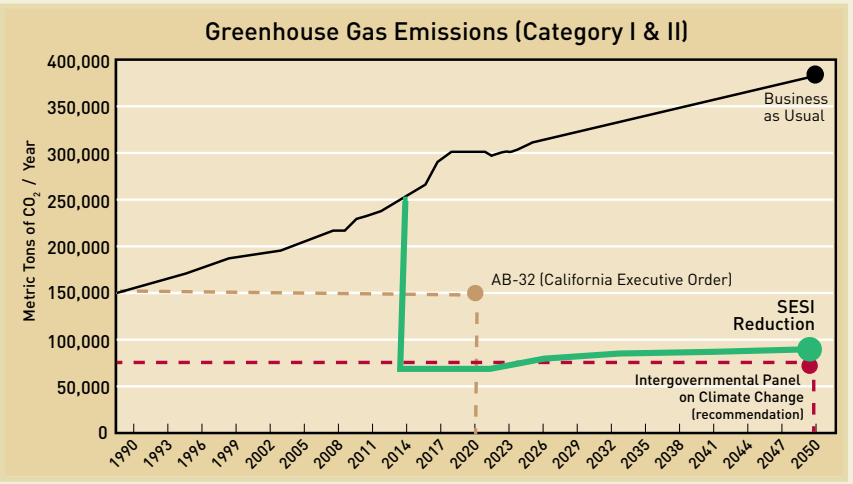
In 2010, for the fifth consecutive year, Stanford completed and certified its public inventory of Scope I and Scope II CO_2 emissions. The 2010 inventory was verified through the Climate Registry (TCR); this organization has replaced the California Climate Action Registry (CCAR), to which Stanford submitted its inventories from 2006 to 2009. In 2010 net emissions increased, a reflection of campus growth and increased research building intensity. Newly available electricity consumption data for Falk and the GALE buildings (Grant, Always, Lane, and Edwards) were captured for the first time and increased the emissions total. Differences between CCAR and TCR reporting protocols on emissions from leased spaces also explain part of the increase.

Stanford reported approximately 198,300 metric tons of CO_2 emissions for 2011 (verification pending). These emissions remained relatively flat, with a slight increase due to occupancy of newly constructed buildings and increased emissions from leased spaces.

Nevertheless, emissions intensity is now lower than it was in 2007, which confirms the efficiency of Stanford's new high-performance buildings. Emissions will also dramatically decrease in coming years as a result of the SESI program, dropping to 50% below 1990 levels upon completion of construction in 2015.







Academic Integration

The Energy and Climate Plan, which was first released in 2008 and evolved into SESI, has been a high-priority study and has incorporated various faculty peer reviews from inception through approval. The first faculty GHG task force convened in 2009 to review the initial plan. Throughout 2011, the heat recovery scheme and proposed financial models were extensively peer reviewed by faculty from the School of Engineering and the Graduate School of Business (GSB), as well as a Board of Trustees advisory committee.

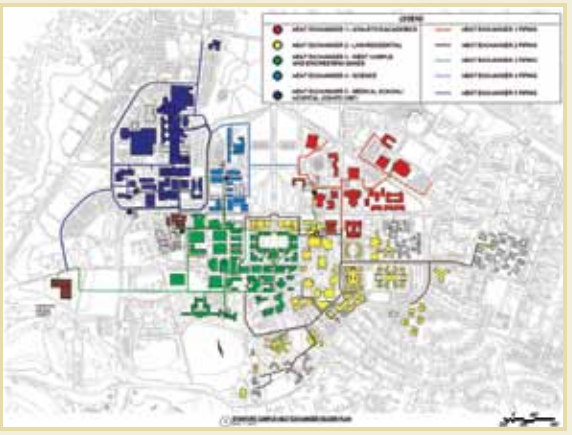
SESI program studies have also periodically engaged graduate student researchers to supplement industry findings, verify models, and assist with other assessments. Most recently, SEM partnered with the Stanford Solar and Wind Energy Project, a student group, to carry out studies on the campus solar potential. Solar photovoltaic (PV) integration is one aspect of SESI currently under investigation, and the students assisted in analyzing data while gaining practical hands-on experience. Stanford staff will continue to partner with students and faculty as SESI proceeds.

Implementation

The implementation of the SESI program involves significant work throughout the campus between 2012 and 2015. DPM is managing design and construction for both the hot-water pipe installation and the heat recovery-based RCEF. This year, engineering firms completed the design for the RCEF, equipment manufacturers were selected, a general contracting firm was hired, and phased utility-level construction began on the new hot-water piping that will be installed throughout campus by 2015. See additional details below:

- Over the course of implementation, more than 20 miles of hot-water pipe will be installed, and equipment in the mechanical rooms of 155 buildings will be modified to allow them to use hot water for heating instead of steam. This work will be carefully sequenced in multiple phases to minimize disruption to campus life. The first of seven phases has recently been completed, and subsequent phases have begun.
- As each phase of piping and building conversion is completed, that section of campus will be moved off steam to hot water via a regional heat exchanger that will convert steam from the existing cogeneration plant to hot water at a district level.

Work to convert the campus from steam to hot-water systems has already begun and is being carefully timed to minimize disruption to the campus community.



Campus piping will be converted in phases. An up-to-date map of current construction is available at sesi.stanford.edu.

- Once all phases of the conversion are complete, a full transition from the cogeneration plant to the RCEF will be made, the regional heat exchange stations will be removed, and the cogeneration plant will be decommissioned and deconstructed.
- The RCEF will be an all-electric, state-of-the-art heat recovery plant featuring both hot- and cold-water thermal storage. SEM will operate it with a new automated control system invented at Stanford (patent pending) and currently under commercial development by a startup company (ROOT3). This will allow the plant to operate autonomously and will assure optimal operation through predictive economic dispatching based on load and market electricity pricing forecasts.

Campus Outreach and Coordination

The SESI program is the most pervasive utility-scale construction project in campus history. DPM and the Office of Sustainability launched a comprehensive outreach effort and met with over 30 campus departments and entities to coordinate the scheduling and timing of the phased construction.

The SESI website launched in the summer of 2012 to provide an avenue for interested community members to learn about the program and follow associated construction on a real-time map. It also includes project fact sheets and links to related articles. Most notably, it contains an interactive campus map that shows the current and future construction zones and project progress.

In addition, a revised version of the popular educational video contains an expanded section on SESI, including heat recovery and other benefits.

Looking Ahead

As core elements of the SESI program are implemented, Phase 2 studies of additional potential major enhancements to the campus energy system have begun. These include potential on-campus PV power installations as well as development of a ground source heat exchange (GSHE) system to complement the core heat recovery process based on the chilled-water system.

A feasibility study of on-campus PV power development is underway, including preliminary site investigations and prioritizations. Based on favorable findings from a feasibility study that included geothermal and hydrogeologic modeling of the Stanford site, a Phase 2 GSHE system study is under way that includes exploratory borings of the local subsurface to confirm the engineering feasibility of the system as well as preliminary environmental and regulatory investigations. These studies are expected to be completed in mid- to late 2013.

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Fifth Annual Campus Greenhouse Gas Emissions Inventory Verified 130

Public Utilities Commission Decision on PG&E Fees Gives Major Boost to SESI 133

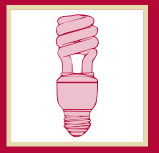
More Information:

http://sesi.stanford.edu

http://sustainable.stanford.edu/climate_action

http://sustainable.stanford.edu/climate_video

Further Strides in Energy Efficiency



Background

Since 2010, a redesigned Facilities Energy Management (FEM) team has been responsible for coordinating the university's efforts to reduce energy use in existing buildings and to incorporate energy efficiency best practices into all new buildings. The team works with BGM and zones to ensure buildings are operated efficiently and manages multiple programs that offer technical as well as financial assistance to facility managers, department leads, and building occupants to encourage implementation of energy efficiency projects.

Results

The Whole Building Energy Retrofit Program seeks to reduce energy consumption in Stanford's most energy-intensive buildings. The Packard Electrical Engineering building retrofit, completed in 2012, included upgrades to the heating, ventilation, and air conditioning (HVAC) system and controls. This $30 million capital program began in 2004 to address the 12 largest energy-consuming campus buildings and now includes the top 26, which represent 60% of total campus energy use. Retrofits have been completed in 13 buildings thus far and have saved more than $3 million a year in energy costs. The program has also yielded over $2 million in financial incentives via Pacific Gas & Electric rebates.

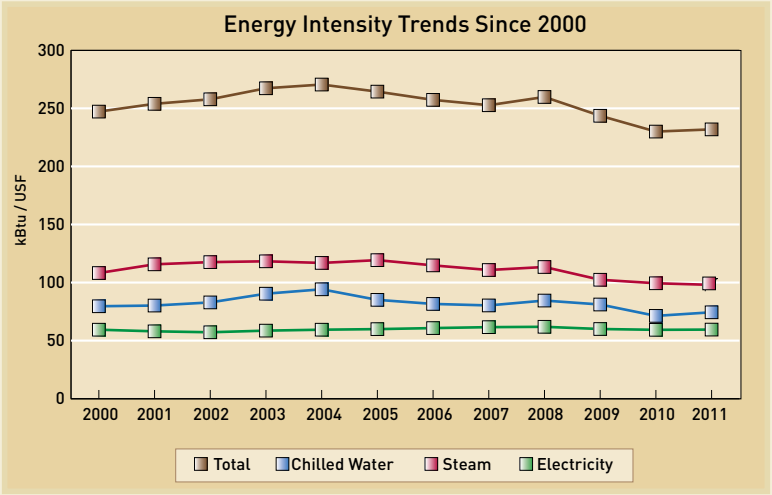
Since 1993, the Energy Retrofit Program has provided rebates to Stanford Utility users who install efficiency upgrades within their facilities. Rebates cover some or all of the costs of the upgrade projects, depending on the project payback period. Projects completed in 2011-12 include an LED lighting retrofit in the Herrin Hall Biology Greenhouses, high-efficiency air filter upgrades at the Keck Science Building, and the addition of variable-speed drives to motors at the Arrillaga Center for Sports & Recreation.

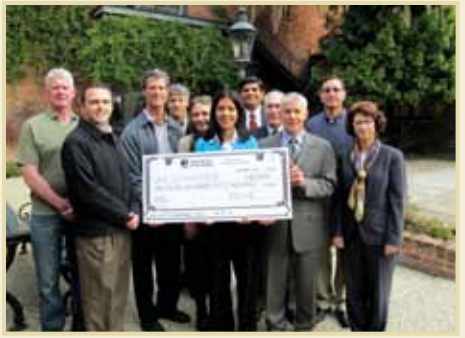
Launched in 2008, the Sustainable IT Program promotes the adoption of energy-efficient IT technologies and management practices. Since this collaborative program began, Stanford has saved over $850,000 per year in utility costs

through measures like server virtualization, desktop energy management, and redesigned server rooms. In 2012, its server virtualization incentive program targeted all business units on campus that use or manage server racks and data centers. The program provides rebates for each physical server converted to a virtual environment.

The two-week winter break continued to be an opportunity to save energy and reduce operating expenses. The 2011–12 winter curtailment effort allowed Stanford to avoid $266,000 in utility charges. The cumulative net energy cost savings since 2001 total $2.5 million.

Operations staff continue to monitor building performance, looking for improvement opportunities related to operating schedules, HVAC set points, and maintenance work. Program highlights for 2012 include the launch of the new Building Holistic Maintenance Program and the completion of 23 building HVAC recommissioning projects. In addition, the staff continued to refine the Building Systems Performance Evaluation, which is used to probe, inspect, and monitor various sensors in HVAC systems. This allows operations technicians to remotely control, adjust, and repair room settings to meet user needs and optimize performance. The cumulative effect of all these energy efficiency programs can be seen in the fact that overall energy intensity (kBtu/USF) remains less than it was in 2000, despite the addition of nearly one million square feet of new energy-intensive laboratory space. This suggests that the suite of energy-saving programs targeting large-scale building retrofits, small-scale retrofits, and HVAC controls, coupled with new construction standards, has curbed the rate of increase in energy intensity.





Stanford has received over $2 million in rebates from PG&E for energy efficiency initiative

Members of Stanford's HVAC shop installed improved filtration media that saved more than $26,000 annually at the Clark Center as part of the Energy Retrofit Program.

Other notable performance trends include the following:

- Electricity consumption per USF has remained relatively constant even as energy-intensive research functions and computing needs have increased.
- Steam consumption per USF has also remained relatively flat. A notable decrease starting in 2009 correlates with the completion of major HVAC upgrade projects in multiple buildings.
- Chilled-water consumption per USF increased through 2004 but is now trending downward. This also illustrates the benefits of energy retrofits in multiple large buildings.

Academic Integration

The FEM team engages frequently with research faculty to better understand energy demand inherent to their work and tailors program offerings accordingly:

- FEM staff regularly interact with faculty in the Center for Integrated Facility Engineering (CIFE). FEM team members serve as guest speakers for CIFE courses, help review student projects, and provide feedback on the research needs associated with the operation of high-performance buildings. In 2012, FEM and CIFE began collaborating to explore the development of improved automated fault detection and diagnostic systems. The goal was to leverage the growing inventory of operating data within existing building control systems to identify opportunities for energy savings. CIFE is focusing on the research aspects, and FEM is evaluating commercial solutions already on the market.

- Stanford's Energy Conservation Incentive Program, established in 2004, provides schools and administrative units a financial incentive to use less electricity. The program sets budgets based on past consumption and lets participants "cash in" unused kilowatt-hours; those that exceed their electricity budgets pay the difference out of their own funds. Based on the program's success, FEM began working with schools and administrative units in 2012 to recalibrate electricity allotments and incentivize participants to reduce consumption further.
- Since 2009, FEM has partnered with the School of Medicine (SOM) to offer financial incentives to all campus labs that put biological samples into room-temperature storage and dispose of old ultra-low-temperature freezers. The Cash for Clunkers program makes it easy to try room-temperature storage technology, and participants can earn rebates up to $13,000.

Looking Ahead

FEM will continue to maintain and expand its existing programs in 2013. The Whole Building Energy Retrofit Program will carry out upcoming retrofits to the Clark Center, the Arrillaga Alumni Center, and Green Earth Sciences. The Sustainable IT program will continue its server virtualization efforts, and aims to ensure that an additional 1,500 virtual servers are deployed over the next three years in lieu of physical hardware, saving the university significant energy costs and rack space.

There are also several new initiatives that are expected to launch in 2013. FEM is developing a new energy efficiency project tracking tool that can record the efforts of all programs and implementers across campus within one system. This will provide a single source to summarize project type, technologies deployed, energy savings, project costs, and other key metrics. The group will also launch the continuous commissioning pilot project, which will test and evaluate new third-party software aimed at automatically finding energy savings opportunities by analyzing existing building control system data. In addition, a high-performance building evaluation is underway to assess the efficiency performance of new construction projects at Stanford.

Related Snapshot Stories

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More Information:

http://sustainable.stanford.edu/buildings

http://sustainableit.stanford.edu

http://lbre.stanford.edu/sem/energy_conservation

Strong Performance in Water Efficiency and Conservation

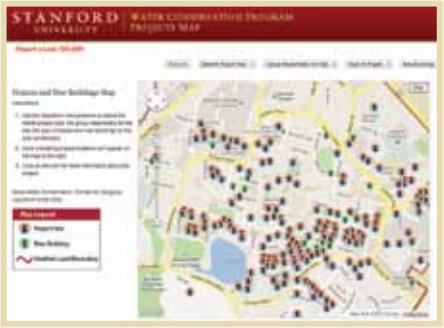
Background

Stanford practices sustainable water use by managing available resources to meet its needs while preserving ecological systems and this vital resource for future generations. Stanford has improved campus surface water supplies, developed innovative alternative water supplies, and continued water conservation efforts for its buildings and grounds.

Results

As of 2012, Stanford has reduced domestic water use on campus 21% from a 2000 baseline, despite adding more than one million GSF to the building portfolio. The 2003 Water Conservation Master Plan originally identified 14 water conservation measures for campus; more than 20 are employed today. Additional results include the following:

- Staff from the School of Medicine and SEM collaborated to complete a retrofit of equipment-washing infrastructure. The changes included reverse-osmosis water reuse for quenching hot wastewater from washing equipment. The improvements are projected to save 2.5 million gallons of water and over $39,000 in domestic and wastewater costs per year. The payback period is less than eight years.
- Six weather-based controllers were installed at landscaped areas surrounding the Li Ka Shing Center for Learning and Knowledge (LKSC), Lorry I. Lokey Stem Cell Research Building (SIM1), and Center for Clinical Sciences Research. As a result, LKSC reduced its outdoor water consumption by over 140,000 gallons during the first month after installation compared to the same month the prior year. The project is expected to reduce water consumption by approximately 24% across the entire area of deployment.
- Conservation measures implemented at the Bing Nursery School included a change in the rotor spray nozzles to reduce the spray pattern radius and precipitation rate, additional irrigation valves to separate hydrozones and

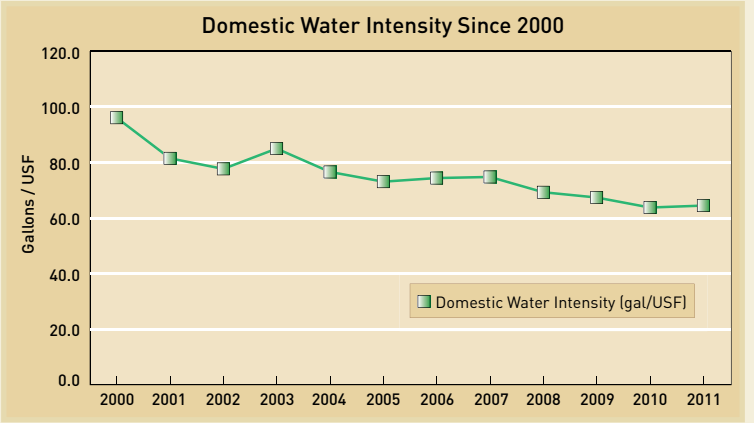


Stanford's interactive water conservation map displays information about all water conservation projects across campus.

The barnacle water meter provides real-time monitoring to help identify water leaks at specific campus locations.

better align with plant watering requirements, and a return to irrigation control via a Maxicom weather-based system. These changes are expected to yield a minimum water savings of 15% annually.

- The water conservation program unveiled an interactive map that details water conservation retrofit projects from 2002 to the present. A variety of sorting parameters allow users to quickly search more than 300 indoor and outdoor projects linked to the map. Clicking on the map's icons provides details on the water-efficient equipment installed during retrofit projects, as well as the estimated water savings, when available. The map also includes general water profiles for each new building opened since 2007.
- Stanford staff coordinated with local plumbing-product representatives to test new and innovative water-efficient fixtures as part of an ongoing demonstration program. Since 2010, the program has field-tested over 20 different low-flow fixtures, including toilets, urinals, showerheads, and faucets.
- In 2011, the water conservation program started testing real-time monitoring technology to identify water use on a more granular basis and define specific end uses, such as irrigation specific to landscape areas or use by research equipment. This monitoring has provided time-of-water-use information directly to customers involved in the study, which has resulted in greater attention and increased water efficiency.
- Most of the toilets, faucets, showers, and urinals in academic buildings have been retrofitted to more efficient, low-flow models. Building retrofits eliminated once-through cooling and water use for house vacuum systems in research lab buildings. Landscaping in academic areas makes use of evapotranspiration irrigation controllers.



The chart above shows the cumulative effect of these projects. Stanford has reduced domestic water consumption by 21% and domestic water intensity by 33% since 2000.

Academic Integration

In 2011, a joint steering committee of faculty and staff was formed to oversee a study being conducted by staff from various departments to determine the best future for Searsville Dam and Reservoir. The Stanford-owned dam, located in Jasper Ridge Biological Preserve, was built in 1892 and the reservoir provides water for campus irrigation.

The committee is cochaired by Chris Field, founding director of the Carnegie Institution's Department of Global Ecology, professor of biology and environmental earth system science, and faculty director of Jasper Ridge Biological Preserve, and Jean McCown, director of community relations. It includes five scholars who specialize in environmental science, history, and law, as well as staff members who work in such areas as university land use, sustainability, and water resources. In the 2011–12 academic year, the study began drawing on the technical expertise of consultants specializing in areas including engineering and hydrology, ecosystems, cultural and biological resources, and land use and environmental planning to help sort through the complex technical and legal issues involved in deciding the dam's future.

This comprehensive, multidisciplinary effort is expected to span approximately two years and will consider factors such as research and academic programs at Jasper Ridge, the university's water supply and storage needs, biological diversity both above and below the dam, impacts on flood risk to the surrounding communities, and the costs of dam removal or ongoing management and

Searsville Dam and Reservoir, built in 1892 and owned by the university, is the subject of a multiple-year study.

maintenance. The study will cover some 20 subtopics, including dam structure and long-term integrity, downstream impacts of changes in sediment management, fish passage, and archeological resources. It will examine all viable alternatives for the facility, including the dam itself and its accumulated sediment, and potential ways to replace its functions. Possible actions the study will consider include dredging the reservoir and altering or removing the dam.

Looking Ahead

The water conservation team continues to identify areas of potential improvement across campus, looking at buildings, grounds, and fixtures. In addition to continuous improvements at specific locations across campus, a few large water conservation programs are currently under way. The SESI program will reduce the water evaporated via cooling towers, thereby reducing the university's total potable domestic water consumption by 18%. After the Searsville committee completes its work, a Sustainable Water Plan for Stanford will be completed, incorporating the results of that study as well as investigations into Stanford's other supplies, and will be presented for administrative approval.

Related Snapshot Stories

Interactive Campus Water Conservation Project Map Launches 115

Bing Nursery School Goes Green with Water Conservation Measures 161

More Information:

http://lbre.stanford.edu/sem/water_conservation

http://sustainable.stanford.edu/water_initiatives

http://news.stanford.edu/news/2012/march/searsville-dam-committee-030712.html

Excellence in Building Design, Construction & Renovations

Background

Buildings represent one of the university's greatest sustainability opportunities and challenges. Energy generation for building heating, cooling, and electricity accounts for the majority of Stanford's carbon emissions—and from 2000 to 2025, the university expects to build two million square feet of academic facilities, as well as housing for 2,400 students, faculty, and staff. To evolve as a center of learning, pursue world-changing research, and respond to pressing environmental concerns, Stanford designs and creates buildings that use resources wisely and provide healthy, productive learning environments.

The Department of Project Management (DPM) oversees major construction on campus. Advancements in high-performance building design, construction, and renovation continue to ensure that Stanford delivers and maintains new facilities in accordance with its project delivery process manual. The manual incorporates sustainability through the guidelines for life cycle cost analysis, the guidelines for sustainable buildings, salvage and recycling programs, and a strong emphasis on commissioning. In 2008, Stanford updated the guidelines for sustainable buildings to include aggressive energy and water reduction goals. New construction and major renovation projects on campus are now expected to use 30% less energy than building codes allow and consume 25% less potable water than comparable campus buildings. In addition, Stanford continues to explore methods to increase space efficiency to reduce the need for new construction.

Results

In March 2012, the Knight Management Center, home to the Graduate School of Business, received formal LEED for New Construction Platinum certification, the highest rating awarded by the U.S. Green Building Council. The 360,000-square-foot facility integrates sustainability in every aspect of its design and operation. Its eight buildings are oriented on an east-west axis to maximize natural daylight while minimizing heat gain. They were also designed to exceed current energy efficiency standards by 42%, and the university's largest solar array supplies

The William H. Neukom Building at the Stanford Law School is projected to use 30% less energy than required by code.

Panama Mall renovation will convert a former back alley into an open boulevard.

12.5% of the facility's electricity. Rainwater is captured and used for landscape irrigation, and as a result of this and other water efficiency measures, the Knight Management Center uses 80% less water than comparable campus buildings.

Additional highlights from new construction and major renovation projects are described below.

- A central theme of openness characterizes the law school's newly opened William H. Neukom Building. Sustainability strategies such as maximized use of natural light, automated control systems, natural ventilation, ceiling fans, high-efficiency glazing, and trellis shading contribute to a level of energy use projected to be 30% less than code. The building's exterior features rainwater harvesting and native plant species.
- Construction of the fourth and final building in the Science and Engineering Quad is now under way, and the building is expected to perform even better than its predecessors, including the Jerry Yang and Akiko Yamazaki Environment and Energy Building, which currently uses 42% less energy and consumes 90% less potable water than permitted by code.
- A post-occupancy engineering study of SIM1 confirmed that the building has exceeded the project goal of being 34% more energy-efficient than code. Its HVAC system, designed to eliminate the typical inefficient cycle of overcooling and local reheat, coupled with an optimized control strategy, led to energy performance 43% better than code.
- A recent space utilization analysis for the School of Engineering resulted in renovation of more than 250,000 square feet along Panama Mall in buildings such as Peterson Lab, Durand, and Mitchell. The study resulted in plan changes that reduced the total square footage proposed for the Science and Engineering Quad by more than 20%, avoiding the need for approximately 100,000 square feet of new construction.

The Knight Management Center, new home to the GSB, has 4,643 on-site solar PV modules, producing 12.5% of the facility's energy.

The final building in the new Science and Engineering Quad, to house Bioengineering and Chemical Engineering, is currently under construction.

- Stanford recently submitted several new project designs for approval under California's new green building standard, CALGreen, including the West Campus Recreation Center and the Bioengineering and Chemical Engineering Building. Stanford continues to incorporate local and state requirements into its best practices.
- Construction began on several components of the Stanford University Medical Center (SUMC) Renewal Project, including the Welch Road Utility Project, renovation of the Hoover Pavilion, and site work for the Lucile Packard Children's Hospital (LPCH) expansion. Both the LPCH expansion and the new Stanford Hospital are expected to achieve LEED-NC Silver equivalency.

Academic Integration

Collaboration with faculty and research staff, particularly in the programming of interdisciplinary space, remains a DPM hallmark. The school/department user group is the program advocate throughout each project. This group may include the dean/director, faculty, staff, and/or students. It designates a representative who is responsible for gathering and disseminating information, communicating it from the project team to the group and vice versa, within project schedule constraints. The DPM project manager coordinates directly with this representative. DPM relies on this collaboration to express the needs of the program to the Stanford University administration and to manage communication and decision making within the school/department.

Bing Concert Hall, shown here in a rendering, will hold its first performance in January 2013.

Looking Ahead

Today, all new construction projects across campus showcase high-performance building practices. Bing Concert Hall, a world-class, acoustically exceptional concert venue on campus, will be complete by the end of 2012. SESI construction, including construction of the new, state-of-the-art RCEF, will continue through 2015. The final building of the new Science and Engineering Quad will be complete in 2014 and will exceed the precedent set by earlier construction in the quad.

In addition, renovations are under way to campus art buildings, including construction of a new gallery at Cantor Arts Center to house the Anderson Collection and design of a new Contemplation Center to house the work of artist and Stanford faculty member Nathan Oliveira. Continued renovation of Panama Mall, to be completed in 2013, will fully convert a former back alley into an open boulevard and inviting academic space.

Together, these construction projects will ensure that Stanford has the most environmentally responsible and innovative facilities possible, allowing the university to fulfill its academic mission.

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Knight Management Center Earns LEED-NC Platinum Rating	144
Panama Mall Renovation Enhances Campus Sustainability	188

More Information:

http://sesi.stanford.edu

http://lbre.stanford.edu/dpm/our_projects

http://sustainable.stanford.edu/green_buildings

New and Improved Offerings in Transportation

Background

As an essential part of its drive for sustainability, Stanford runs one of the most comprehensive programs in the country to reduce university-related traffic impacts. This year, Stanford's Transportation Demand Management program (TDM) reached a milestone: The Stanford Commute Club, which rewards commuters for using sustainable transportation, celebrated its tenth year. The program has grown from 3,600 members to 8,000, with each member currently receiving up to $300 a year from Stanford for commuting primarily by alternative transportation. The university's free Marguerite shuttle annual ridership has risen to 1.8 million. Stanford has also introduced new programs, including car sharing, which has grown from three Zipcars in 2007 to 46 today, making it one of the largest university Zipcar programs in the nation.

These TDM advances, coupled with extensive marketing outreach and promotions, enabled Stanford to reduce its drive-alone rate from 72% in 2002 to 47% in 2012, with more than half of university employee commuters now primarily using sustainable transportation. Demand for parking at Stanford has dropped more than 6% since 2002, despite campus growth.

In addition, Stanford is transitioning to more sustainable fleet vehicles, increasing shuttle route efficiency, expanding electric vehicle (EV) charging station availability on campus, and continuing to enhance its bicycle program infrastructure.

Results

In academic year 2011–12, the university continued to expand its sustainable transportation efforts, including its long-term planning and its signature bicycle program.

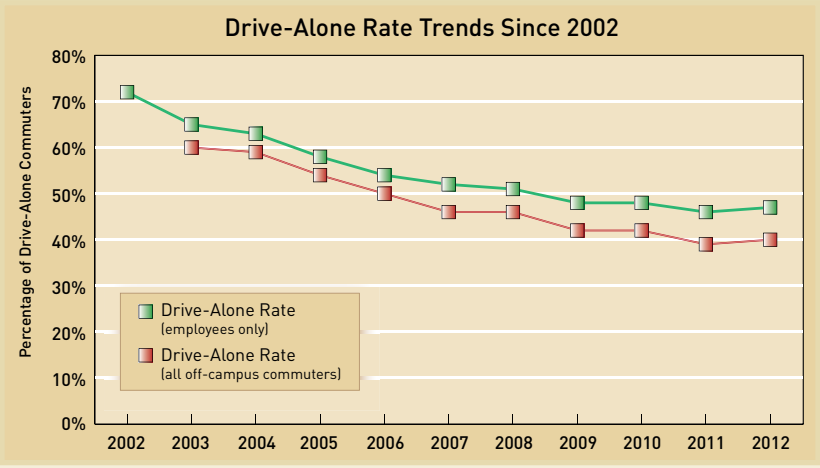
The university has drafted a long-term Transportation Sustainability Plan, which is currently under review. The plan expands on the successful TDM program and positions Stanford not only to continue to satisfy the 2000 General Use Permit's

trip-limit goals, but also to reduce transportation-related emissions, satisfy impending state and national regulations, and be poised for transportation-related carbon reduction programs.

Designated the nation's first and only Platinum-Level Bicycle-Friendly University in 2011, Stanford expanded its bicycle program to accommodate the estimated 13,000 bikes on campus each day. The expansion included new bike racks—there are more than 18,000 on campus—and new bicycle safety repair stands that offer free tools for bicyclists to pump up tires and make minor repairs.

The 2011–12 performance achievements are listed below:

- In 2012, the employee drive-alone rate dropped to 47%, compared to 72% in 2002 at the inception of the formal TDM program. More than 2,000 Stanford commuters started using alternative transportation during this period. Commute-related emissions remain below 1990 levels. The Commute Club celebrated its 10-year anniversary and has more than doubled its membership since 2002.
- Marguerite shuttle passenger numbers rose again, from 1.4 million in 2010 to 1.8 million in 2011. Stanford increased fuel conservation and reduced emissions and operating costs by adding three 38-passenger diesel-electric hybrid buses. By replacing other buses with fuel-efficient Sprinter vans on selected routes, the university reduced emissions by 132 metric tons and fuel consumption by 13,000 gallons.



Stanford promotes a variety of methods of alternative transportation, including riding the train or bus and biking.

Stanford provides parking, repair stands, and classes to support the more than 13,000 bikes on campus.

- In 2012, Stanford partnered with transit agencies to offer new express bus service and discounted train tickets and passes to encourage more commuters to ride mass transit. SLAC partnered with Zimride, a car-sharing service, to increase carpooling amongst employees.
- Stanford worked with AC Transit to establish a new Dumbarton Express bus service to the campus directly from the East Bay, where the existing Line U East Bay Express service had operated at capacity for years due to high demand. Both express bus services are free to eligible Stanford commuters.
- In partnership with Altamont Commuter Express (ACE), Stanford now offers a 50% discount to Stanford faculty, staff, and students who purchase ACE train monthly passes and 20-trip tickets.
- Over one-third of Stanford's 1,300 fleet vehicles are electric, and the number of hybrid vehicles increases each year. The fleet also includes one experimental solar vehicle. The Marguerite shuttle fleet includes five diesel-electric hybrid buses and 48 buses fueled by biodiesel.

Academic Integration

To reduce traffic congestion and vehicle emissions, in April 2012 Stanford launched Capri (Congestion and Parking Relief Incentives), an innovative research pilot project that uses radio-frequency identification technology to track when participating commuters enter and exit campus. Participants who commute during off-peak times receive credits that they can redeem in a game that offers multiple opportunities to win cash prizes.

The research project's director, Balaji Prabhakar, professor of electrical engineering and computer science, worked with Stanford graduate students and Stanford Parking & Transportation Services to secure a grant from the U.S. Department of Transportation and implement the program at Stanford. The research team's goal is to change commuter behavior. In the process, they hope to determine what the optimum incentives are, how to incorporate a game to engage and motivate commuters, and how to leverage social networks to encourage and increase participation.

Looking Ahead

Many new and exciting TDM initiatives are in development. Through a regional transportation study, Stanford is evaluating its long-term growth, including growth in Stanford Research Park, to determine which options could be considered to address potential traffic impacts. The study will consider not only a wide range of physical, TDM, and policy options, but also new or even experimental approaches. Development of an EV charging station policy is a priority for 2012–13. Six EV charging stations on campus are available to Stanford commuters, residents, and the public for a fee of $3 per hour. The university is reviewing its approach to EV charging, including assessing the number and location of stations to be installed in the future, deciding whether to continue charging fees, and determining charging level options. The second phase of the Capri program is expected to launch in 2012–13. In an effort to reduce wasted time, resources, and emissions from cars circling full parking lots in search of spaces, this phase will reward drivers who park in lots with lower space utilization.

Related Snapshot Stories

Commute Club Celebrates Tenth Anniversary 125

Record Participation During Second Annual Bike Safety Dorm Challenge 129

Stanford Again Designated as Best Workplace for Commuters 137

Innovative Transportation Program Rewards Commuters for Driving Outside Peak Hours 148

Bike to Work Day Encourages Pedal Power 166

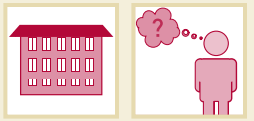
More Information:

http://transportation.stanford.edu

http://capri.stanford.edu

http://commuteclub.stanford.edu

Minimizing Stanford's Waste



Background

Minimizing waste contributes to a more sustainable Stanford. By using less, reusing more, recycling, and composting, the university saves energy, conserves water, reduces pollution, reduces GHG emissions, and preserves natural resources. Stanford has increased its landfill diversion rate from 30% in 1994 to 62% in 2011, and reduced its landfilled tonnage to an all-time low.

Stanford's waste reduction, recycling, and composting program serves all academic and athletic areas, student housing and dining, faculty and staff housing, Stanford University Medical Center (SUMC), SLAC National Accelerator Laboratory, and construction sites. The university continually improves and expands recycling and composting collection activities, identifies new markets for waste materials and recyclables, and raises awareness so that "reduce, reuse, recycle, and compost" becomes an ingrained set of behaviors. Stanford partners with Peninsula Sanitary Service, Inc. (PSSI), its recycling and waste management service provider, to reduce waste, increase landfill diversion, and move closer to zero-waste (defined as at least 90% diversion).

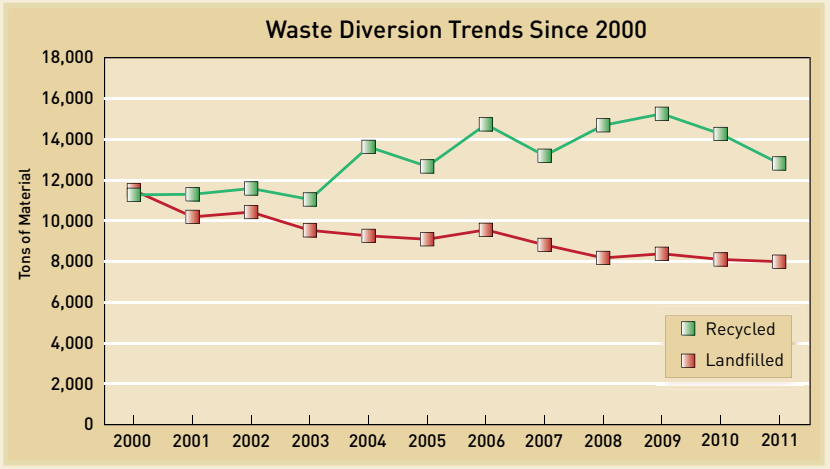
Results

Efforts to reduce waste have steadily decreased the total amount of material Stanford sends to the landfill. Just under 8,000 tons were landfilled in 2011, the lowest value recorded since tracking formally began. This year:

- Stanford's diversion rate (waste diverted from the landfill, as a percentage of total waste) increased from 30% in 1994 to 62% in 2011. Stanford continues to pursue a 75% diversion rate as an interim step towards the ultimate goal of zero-waste.
- Stanford doubled the number of food-waste bins in graduate housing to make it easier for graduate students to compost in their homes. A pilot

office composting program now includes more than 27 collection points and has diverted more than 750 pounds of food waste per month from the landfill. The program is expected to expand to other buildings throughout the coming academic year. A comprehensive composting program also began at the Bing Nursery School with the hope that it will be expanded to other nursery schools on campus.

- A deskside recycling and mini–trash can program was implemented in nine buildings, making paper recycling more convenient.
- SLAC National Accelerator Laboratory implemented a pilot zero-waste program and developed a campaign to decrease bottled-water use.
- Waste reduction has become a part of campus culture in many different areas, including construction. This year's demolition of the Terman Building was able to divert 99.6% of building components from the landfill.
- PSSI became the provider of garbage, compost, and recycling bins at campus events, enabling the organization to more strongly encourage event managers to set up "zero-waste" stations that include a recycling and compost bin next to every landfill bin and improved signage for bin lids. Trash bins now clearly state that they accept landfill-bound items only, to provide a clear and strong contrast with the recycling and composting bins.
- The services offered in faculty and staff housing now include regular collection of hazardous waste (batteries, paint, CFLs, oil, and oil filters) and the opportunity to compost food scraps and food-soiled paper in the yard-trimmings bins.



Stanford has greatly expanded campus composting, doubling the number of food-waste bins in graduate housing and piloting an office composting program.

Zero-waste events are becoming a regular sight on campus.

- Regular waste audits of campus buildings continued to provide valuable information to the Stanford community. More than 50% of the items Stanford sends to the landfill are either recyclable or compostable. Food waste makes up the largest percentage of material sent to the landfill and remains the primary target for program development.
- In the RecycleMania 2012 contest, Stanford received record pledges and scored in the top 30 in six of the eight categories: per capita (28th); gorilla (9th); paper (16th); cardboard (14th); bottles and cans (19th); and food waste (14th).

Academic Integration

PSSI regularly partners with faculty and student groups to conduct waste audits across campus. These events enable the campus community to experience Stanford's waste story in a hands-on setting while providing valuable data to PSSI about the content of campus landfill bins. PSSI engages students who have ideas for improving Stanford's waste program. In 2009, Student Green Fund grant recipients partnered with PSSI to design new labels for all campus waste bins based upon focus group feedback and other research. This past year, PSSI organized a trip for students to visit the Newby Island Compost Facility, where Stanford sends its compostable materials. In addition, PSSI helped students with projects and coursework by advising them on the design of new collection bins, studying material flows for an anaerobic digester, providing support in setting up a reuse store, and taking part in student videos and journalism projects.

Waste audits educate the campus community and provide valuable data about the contents of Stanford's waste stream.

Looking Ahead

Using the waste audit results as a guide, PSSI will continue to focus on improving the opportunities to collect food waste via office, café, and event composting. PSSI has also begun to study best practices for the collection of restroom paper towels for composting. Expansion of the deskside recycling and mini–trash can system to more campus buildings will continue to make paper recycling more convenient. To provide more detailed information to the campus community, an effort will be made to determine and track building-level waste data. In combination, these initiatives will allow Stanford to achieve a 75% diversion rate and meet the requirements of new California state law AB 341.

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SLAC Cultivates Strategy for Zero-Waste	187

More Information:

http://recycling.stanford.edu

http://sustainability.stanford.edu/waste

Enriched Sustainable Food and Housing Programs

Background

Residential & Dining Enterprises (R&DE) leads sustainability for students through its programs in dining and housing, and thus directly impacts student learning, lifestyles, and campus culture. Stanford Dining and Stanford Hospitality & Auxiliaries, divisions of R&DE, serve more than four million meals on campus annually. Through its Sustainable Food Program, R&DE continues to create a positive impact through education, collaboration with campus partners, and innovative operational initiatives. Student Housing, also a division of R&DE, houses nearly all undergraduate students and more than 50% of graduate students on campus. Student Housing recently invested in a full-time staff member dedicated to managing its new Sustainability and Conservation Program Office. The goal of the office is to reduce Student Housing's environmental footprint and provide a foundation for generations of students to lead sustainable lifestyles not only on campus but after graduation.

Results

The largest provider of food services on campus, Stanford Dining manages all of the university's dining halls and about 25% of its cafés. Stanford Dining strives to serve as an educational resource for students, teaching them about nutrition, wellness, and sustainable food systems through dining hall programming. While providing fresh and delicious meals, it decreases pollution from pesticides and chemicals, reduces energy use, and supports local small businesses. Several other campus food services, such as co-ops, row houses, and private cafés, are also committed to sustainable purchasing and practices. Key enhancements in the 2011–12 academic year include the following:

- Stanford students welcomed the October opening of the award-winning Arrillaga Family Dining Commons, the first new campus dining hall in nearly two decades. Besides winning first place in the Montague Suite

Dreams Design Challenge, the state-of-the-art dining hall is on the cutting edge with initiatives such as Performance Dining and a gluten-free pilot program. The dining hall features a special learning kitchen designed to bring students closer to their food through cooking demonstrations and new curriculum.

- The addition of Niman Ranch pork and organic apples to its portfolio of sustainable food purchasing initiatives helped increase Stanford Dining's overall percentage of sustainable food to 43.6% by cost.
- In partnership with the Stanford Farm Project, several hundred undergraduate and graduate students participated in Farm to Fork, an informal series of talks and workshops on everything from the intricacies of the Farm Bill to how to make and cook tofu.
- A new student-initiated course, Earth Systems 11SI: "Grow It, Cook It, Eat It," was offered in spring quarter. The course pioneered the integration of practical culinary and food education with a theoretical framework for analyzing the food system.
- As part of its ongoing focus on waste reduction, Stanford Dining implemented LeanPath, a food waste tracking system, which helped to reduce both food costs and ecological impact by eliminating significant quantities of preconsumer food waste from dining hall kitchens.
- In 2012, Stanford Dining participated in Food Day, a national event that aims to galvanize the community around the issue of food systems change. Students from the Stanford Farm Project, the Graduate School of Business (GSB) Farm Club, Stanford Glean, Students for a Sustainable Stanford, and other groups organized the day around four themes: wellness, ecology, community, and farmers and workers.
- Stanford Catering Executive Chef Andrew Mayne and Stanford Dining Sustainable Food Program Manager Matt Rothe were invited to the Monterey Bay Aquarium's prestigious "Cooking for Solutions," an annual event that includes a two-day conference hosted by the Sustainable Foods Institute. Stanford was the only university food service provider invited.

Stanford Dining now offers organically grown apples.

Stanford Dining is designing many new courses that engage students with their food system in a hands-on fashion.

Academic Integration

The university's Dining Ambassador (DA) program trains students to build and promote better community in the dining halls. DAs help to create a vibrant and active student dining community by promoting wellness, healthy eating, sustainability, and residential life through community-building activities and educational experiences, all while being part of a team proudly serving great food.

Stanford Dining also hosts events throughout the year to increase education and awareness about food issues, often in partnership with student groups and faculty researching similar topics. Examples include Know Your Food Week, Climate-Conscious Food Week, and Seafood Sustainability Week. At each of these events, student volunteers help provide information and resources to their classmates about food issues.

Faculty regularly collaborate with Stanford Dining to provide educational opportunities to students. Examples include two classes developed in 2011–12, "Principles and Practices of Sustainable Agriculture" and "Grow It, Cook It, Eat It." Both classes exceeded expectations and brought key food system issues to light in a creative and hands-on learning environment.

In addition, Stanford Dining hires a group of student gardeners each year to maintain a series of organic gardens across campus. These gardens, strategically located adjacent to campus dining halls, are designed to provide an experiential model of the food system for students to observe at every meal.

Student Housing also partners with students to enhance environmental programming within the dorms. The Green Living Council is a group of dorm environmental representatives who educate their peers about sustainable living and work to improve the sustainability of their dorms or houses.

Stanford Catering Executive Chef Andrew Mayne and Stanford Dining Sustainable Food Program Manager Matt Rothe were invited to participate in "Cooking for Solutions."

The Green Living Council partnered with Student Housing to hold a green "free store" during move-out.

Looking Ahead

R&DE sustainability programs have many enhancements under way. Specifically, the new Sustainability and Conservation Program Office in Student Housing has established its goals and strategic plan for the upcoming years. Long-term initiatives include a new high-performance residence, an overhaul of utilities management, and provision of more consistent infrastructure to support sustainable behaviors across residences, such as recycling and composting. Smaller-scale initiatives include sustainable-living workshops, a more interactive website, student internship programs, and an enhanced "green move-out" program at the end of the academic year. Stanford Dining also continues to evaluate its purchasing choices to ensure it is getting the healthiest, most sustainable, and most socially responsible food.

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Farm to Fork Program Connects Students with Sustainable Food 131
New Course Empowers Students to Make Sustainable Food Choices 146
Students and Housing Partner to Reduce Waste during Move Out 176

More Information:

http://www.stanford.edu/dept/rde/cgi-bin/drupal/rde/sustainability

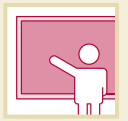
Sustainability in Academia

Sustainability in Academia

In 2006, the university announced the Initiative on the Environment and Sustainability, a component of the Stanford Challenge, a campuswide effort to seek solutions to the world's most pressing problems and educate students for leadership in the twenty-first century. The initiative, in recognition that solutions to complex challenges demand collaboration across multiple fields, supported interdisciplinary research and teaching involving all seven of Stanford's schools as well as centers, institutes, and programs across campus. As a result, all seven schools now offer a wide range of environmental and sustainability-related courses and research opportunities. Over 130 faculty members from 40 departments teach more than 750 graduate and undergraduate courses in this arena, including courses affiliated with the Stanford Woods Institute for the Environment, the collaborative hub of environmental and sustainability-related research, and the Precourt Institute for Energy (PIE).

Stanford now has an expansive array of sustainability-focused research projects, new sustainability-focused majors such as Environmental Earth System Science and the Emmett Interdisciplinary Program on Environment and Resources (E-IPER), sustainability courses in nearly every department, and a variety of student groups working both on campus and beyond. At the center of this expansion is the belief that sustainability is not an isolated issue, but can and should be incorporated into every field. The solutions to the world's environmental problems will require a multidisciplinary approach, which is currently being fostered at Stanford and manifests itself in research, courses, and student activities.

Academic Initiative Creates Foundation and Momentum



Meeting the Stanford Challenge

The Stanford Challenge was a multiyear university campaign to seek solutions to complex global problems and educate the next generation of leaders. University-wide academic and programmatic initiatives on the environment, human health, international affairs, K–12 education, the arts, and graduate and undergraduate education let Stanford supporters change the world and students' lives. The campaign concluded on December 31, 2011, having raised an unprecedented $6.23 billion.

The Initiative on the Environment and Sustainability, a key component of the Stanford Challenge, embraced the mission of ensuring that people can live well on the planet now and in the centuries ahead. Professors from three different fields joined together to lead the initiative: Jeffrey Koseff, the Campbell Professor of Civil and Environmental Engineering and Forman University Fellow in Undergraduate Education; Pamela Matson, the Chester Naramore Dean of the School of Earth Sciences and Goldman Professor of Environmental Studies; and Buzz Thompson, the Robert E. Paradise Professor of Natural Resources Law. From the outset, the initiative focused teaching and research on five key areas: freshwater, land use and conservation, climate and energy, oceans and estuaries, and the sustainable built environment. The Initiative on the Environment and Sustainability provided Stanford with the resources to train a new generation of environmental leaders and begin addressing—through research, teaching, and action—the world's most pressing environmental problems.

Initiative Highlights: Creating Interdisciplinary Institutes

With a landmark gift from Ward, '64, and Priscilla Woods in 2006, the university established the Stanford Woods Institute for the Environment. Professors Koseff and Thompson became the institute's Perry L. McCarty Co-Directors. Housed in the Jerry Yang and Akiko Yamazaki Environment and Energy Building, Woods brings together students, faculty, and staff for interdisciplinary study of

Professors Jeff Koseff and Buzz Thompson codirect the Stanford Woods Institute for the Environment.

The Initiative on the Environment and Sustainability was one component of the Stanford Challenge.

environmental issues. The Institute provides special funding for interdisciplinary research, convenes global leaders, and partners with other institutions, all in order to "create practical solutions for people and the planet."

The environmental initiative's focus on oceans also inspired a new enterprise. The Center for Ocean Solutions (COS), established at Woods with a significant investment from the David and Lucile Packard Foundation, is a partnership among Stanford, the Monterey Bay Aquarium, and the Monterey Bay Aquarium Research Institute. COS takes the initiative's hallmark approach of integrating cutting-edge science and technology with economic, social, and political expertise to identify practical approaches to sustainability.

The far-reaching issue of energy rapidly attracted a critical mass of faculty and students and gave rise to its own organizations. In 2009, a historic commitment from Jay Precourt, '59, MS '60, led to the creation of the Precourt Institute for Energy (PIE), which includes the Precourt Energy Efficiency Center. PIE supports a growing network of researchers whose aim is rapid transformation of the world's energy systems.

In another milestone of environmental and energy philanthropy, Thomas Steyer, MBA '83, and Kat Taylor, JD/MBA '86, funded the launch in 2009 of the TomKat Center for Sustainable Energy to advance technologies that make renewable energy economically competitive and environmentally friendly. In 2010, their further support enabled the law and business schools jointly to establish the Steyer-Taylor Center for Energy Policy and Finance to push clean energy technology to deployment through a focus on finance and regulation.

From left to right: Kat Taylor, Thomas Steyer, and professor Lynn Orr came together to expand research initiatives on energy topics.

The initiative enabled new coursework and majors designed to educate the next generation of environmental leaders. Here, Professor Rob Dunbar leads students in a hands-on marine biology lesson.

Looking Ahead

Eight years after its creation, the Stanford Woods Institute for the Environment is at an exciting and expansive stage of development. To guide this next stage of growth, Woods conducted a major planning process, soliciting input from a broad range of interested parties including faculty, staff, and external stakeholders. Based on this process, Woods crafted a five-year strategic plan that will guide the next phase of development for Stanford's hub of interdisciplinary research on sustainability and the environment.

By 2016, the Stanford Woods Institute will launch new research centers and programs to address emerging issues like climate adaptation and sustainable development. Its faculty, scholars, and students will play a greater role in informing policymakers in state and national capitals. This year Woods plans to open a new office in Washington, D.C., further expanding the research community's advisory role in business, government, nongovernmental organizations, and science boards. The Institute also plans to expand the breadth and scope of its leadership programs for students and post-doctoral scholars, preparing program graduates to serve in key leadership roles around the world, catalyzing practical solutions for people and planet.

Zachary Brown, PhD '13, is carrying out environmental research through a fellowship endowed through the Initiative on the Environment and Sustainability.

Woods recently partnered with the Rockefeller Foundation to look at emerging environmental issues. The Institute is following up on its first Rockefeller dialogue to create greater ties between "natural capital" and human development, and will be looking soon at the connections between natural capital and urban development. Through the Osa and Golfito Initiative, Woods is exploring how to promote sustainable development by addressing all human and societal needs holistically.

Moving forward, the Stanford Woods Institute remains committed to meeting the goals of the Stanford Challenge's Initiative for the Environment and Sustainability: to put ideas into action that will solve the environmental challenges of today and tomorrow.

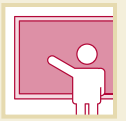
More Information:

http://thestanfordchallenge.stanford.edu/highlights-by-initiative/environment-sustainability/

http://woods.stanford.edu

http://energy.stanford.edu

Innovative Interdisciplinary Solutions



Meeting Global Challenges

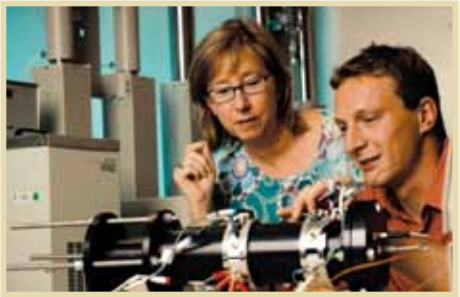
Solutions to the world's most pressing environmental challenges will require the collaboration of members of a variety of fields. Stanford has long recognized this and continues to promote interdisciplinary research to address these critical issues. Woods and PIE are two leading interdisciplinary institutes examining environmental problems through cross-disciplinary collaboration.

Bringing Leaders Together

The Stanford Woods Institute hosts dialogues and policy forums that bring scientists together with decision makers to develop innovative and practical strategies for solving environmental problems. In September 2011, the Fisheries Leadership and Sustainability Forum convened leading academics and experts on fisheries law, policy, and economics to explore fisheries conservation management challenges and solutions. In October 2011, the first Comparative Groundwater Law Policy Workshop was held on campus, bringing together groundwater managers and experts to share the best practices in integrated groundwater management. In February 2012, Woods hosted an "Uncommon Dialogue" between land managers and academics to foster development of collaborative projects on Bay Area lands that combine research and land management. A subsequent Uncommon Dialogue in April examined water scarcity in the West and brought together groundwater managers and stakeholders to discuss how research could best assist in solving real-world water problems.

Improving the World

Researchers at Stanford continue to set the bar for interdisciplinary collaboration and development of research projects that have practical impact locally and around the world. Highlights from the past year of research, the majority of which



Professor Sally Benson and her team study underground storage of carbon dioxide.

Assistant Professor of Biology Tadashi Fukami and lecturer in biology Sara Brownell piloted a new hands-on method of teaching undergraduates biological research techniques.

are featured in detail in the Snapshots section, show the real-world implications of the work happening on campus. That work has included:

- Founding a new research center to study urban water infrastructure
- Exploring the impact of biofuels on food security
- Creating a new Bay Area PV consortium to fund groundbreaking solar research
- Engineering stronger carbon nanotubes to energize fuel cells
- Promoting a revolutionary new plan to power the world with renewables by 2030
- Investigating microbes that could potentially make solar power available at night
- Showing that decreasing the amount of time that families in sub-Saharan Africa must walk to obtain clean water can help save the lives of young children
- Designing a groundbreaking new technology that could lead to wireless charging of electric vehicles while they cruise down the highway
- Investigating the practicality of underground storage of carbon dioxide
- Advising Hawaiian landholders on the best environmental outcomes for land based upon ecological models
- Informing lawmakers on Capitol Hill about the latest climate science
- Harnessing sophisticated weather models to recommend optimal placement of offshore wind farms

Doctoral student Jamie Dunckley researches how corals obtain nutrients.

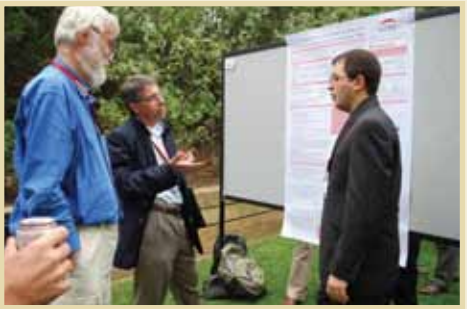
Assistant professor Wendy Mao and graduate student Yu Lin make new forms of carbon.

- Providing a model for integrated agriculture that preserves tropical biodiversity
- Developing an ultrafast, inexpensive nickel-iron battery

Stanford's researchers continue to partner with stakeholders and community members across the world to develop practical and local environmental solutions that have global impacts.

Supporting Cutting-Edge Research

Stanford's interdisciplinary institutes have the distinction of appointing their own faculty, allowing researchers to carry out cross-disciplinary work most effectively. In addition, these institutes support research through grants. Woods' Environmental Venture Project fund awarded $833,000 in 2012 to innovative, interdisciplinary environmental research, bringing the total awarded by the fund since inception to more than $7.2 million. In September, the Global Climate & Energy Project (GCEP) awarded $3.5 million for research that could potentially transform energy storage on the electric grid, a change crucial to managing rising supplies of intermittent solar and wind power. A week later, PIE and the TomKat Center for Sustainable Energy announced $2.2 million in seed grants for Stanford faculty. The awards support innovative technologies that use the sun and the air to generate power. The TomKat grants focus on large solar projects for electric utilities. In March, GCEP awarded $8.4 million to Stanford researchers to develop tools to address climate change. These combined investments support fundamental research and promise to lead to a more sustainable future.



Events like the Art and Science of Sustainability Colloquium (left) and GCEP Research Symposium (right) bring together academic and industry readers from a variety of disciplines.

Interdisciplinary Events

To facilitate collaboration and showcase emerging research themes and results, Stanford faculty and research entities continuously host events, forums, and symposia. The following events (and primary sponsors as indicated) are described in detail in the Snapshots section.

- Energy@Stanford & SLAC Conference (PIE)
- Comparative Groundwater Policy Forum (Woods)
- GCEP Research Symposium (GCEP)
- Food Summit (School of Medicine)
- USRio+2.0 Conference (GSB)
- Uncommon Dialogues series (Woods)
- DC Bootcamp (Woods)
- Smart Grid Workshop (TomKat Center for Sustainable Energy)
- Energy Seminar series (PIE)
- Connecting the Dots Symposium (TomKat Center for Sustainable Energy)
- Silicon Valley Energy Summit (Precourt Energy Efficiency Center)
- Art and Science of Sustainability Colloquium (Vice Provost for Undergraduate Education)

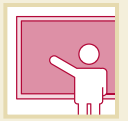
Related Snapshot Stories

More Information:

http://woods.stanford.edu

http://energy.stanford.edu

Student Leadership and Activities



Background

Students interested in sustainability at Stanford can find many avenues for their passion: student groups, academic courses, sustainability-focused and -related majors, and internships and research opportunities with faculty and staff. In fact, student ideas often galvanize change on campus and lead to improved sustainability offerings.

More than 20 student groups at Stanford work towards increased sustainability. A list of major groups is available on the Sustainable Stanford website (http://sustainable.stanford.edu/student_groups). Most of these groups include both undergraduate and graduate students, leveraging talent and passion to initiate change in everything from slow food to green living and solar cars. Students are the core of the Stanford community, and their passion and enthusiasm result in remarkable outcomes every year.

Highlights

Bridging Art and Environmentalism

Students continue to develop innovative methods to spread environmental messages. This past year, multiple groups held events designed to explore environmental issues through art. For the second year, Students for a Sustainable Stanford (SSS) and Stanford's Student Organizing Committee for the Arts partnered to create an all-campus art and sustainability festival. This year's event, titled Art After Dark, brought dozens of student artists together to exhibit over 250 pieces of art, drama, spoken word, dance, design, and music. In June, Earth Systems and Environmental Earth System Science held the first-ever "Art-B-Q." The exhibition was open to all students, faculty, and staff with an interest in environmentally themed art, and it received over 20 submissions of visual, written, musical, and dance creative pieces. Students felt it was important to provide the opportunity for students, faculty, and staff to showcase their creative talents, an opportunity that the curriculum typically does not provide.

Student Ethan Estess' art from reclaimed materials showcases marine environmental issues, such as overfishing.

This dinosaur, shown at Art After Dark, is made of repurposed soda cans.

Outstanding examples of student-initiated art included a project on ocean pollution and a moving video. In January, Earth Systems master's student Ethan Estess held an exhibition in San Francisco of sculptures depicting marine pollution, made with found objects from Recology's Public Disposal and Recycling Area. Garrett Gunther, Dominique Yahyavi, Kris Cheng, and Adam Selzer created a video entitled "Sustainable Trees" to highlight activities that were making the campus more sustainable. Collaborations like these build a bridge between campus communities through genuine relationships and common understanding.

Student-Led Outreach Efforts

Many student groups worked to educate and engage the greater campus community in sustainability challenges through current events and issues.

- The Environmental Justice group of SSS offered multiple outreach events this year. In March, the group partnered with student group Stanford Says No to War to put on Environment and War Week. In May, it partnered with the Center on Democracy, Development, and the Rule of Law's Program on Human Rights to put on a screening and discussion of *Under Rich Earth*, which tells the story of how local people united to prevent a mining land grab in Ecuador's Intag Valley. SSS also cosponsored the program's May conference, Human Rights of Indigenous Peoples in Latin America. Both events highlighted the importance of continued collaboration between the sustainability and human rights communities to address these critical issues.

Members of Stanford's Solar Decathlon Team, which was selected by the DOE to compete in a prestigious national competition. The team will construct a net-zero home powered completely by solar.

- SSS's Zero-Waste group hosted multiple waste audits across campus in partnership with PSSI. These audits educated the community about Stanford's waste stream and proper disposal techniques.
- The Green Living Council (GLC) educated students in each residence about reducing environmental impact by shutting off lights, taking shorter showers, and carrying out other sustainable actions.
- Students also engaged the community in local political issues with sustainability implications. SSS ran a campaign to raise awareness of the pending closure of 70 California state parks. The Outreach team organized a photography competition, arranged well-attended hiking trips to Castle Rock State Park, one of the parks on the closure list, and tabled in White Plaza. The group's work proves that the Stanford community is a critical stakeholder and constituent in the political and civil decisions made off the Farm.

Reaching Beyond Stanford

Students continue to be engaged in projects that address sustainability problems across the globe. Each year, Engineers for a Sustainable World works on a global engineering project to solve an environmental problem in a developing country. This year's focus was the Dhaka Water Initiative, which is developing an in-line chlorinator for low-income urban neighborhoods in Bangladesh that rely on shared drinking-water points, with the goal to reduce incidences of water-borne disease. Stanford GRID Alternatives partnered with a local organization

Stanford Undergraduate Sustainability Scholars blog about sustainability issues both on and off campus.

Student groups often provide outreach to the campus community on environmental issues.

to provide energy efficiency retrofits to low-income homes in the Bay Area. The Stanford Solar and Wind Energy Project's (SWEP's) "Tape and Scissors" project provided educational resources on alternative energy topics to local Bay Area high school teachers. The Stanford Project on Hunger reduced food waste by collecting unused leftover food from campus dining halls for distribution to the homeless and hungry of Palo Alto. Together, these student groups make a positive impact beyond campus while increasing sustainability awareness.

Academic Integration

Stanford's sustainability course offerings continue to grow in scope and vision in response to student demand. An increasing number of sustainability courses integrate practical, service-learning components. Students are also challenged to think beyond their majors, to reach across disciplines, and to develop practical solutions for a sustainable world.

Highlights of interdisciplinary service-learning courses from the 2011–12 academic year include:

- EARTHSYS 11SI: Grow It, Cook It, Eat It: Personal Empowerment in Interdisciplinary Food Systems
- EARTHSYS 135: Podcasting the Anthropocene
- ANTHRO 332/ENGR 231: Transformative Design
- EARTHSYS 14SI/EESS 11SI: Human and Environmental Rights from Farm to Fork

Student filmmakers created a video showcasing the variety of actions being undertaken to make campus more sustainable.

Former SWEP president Nick McIntyre educates local youth about how solar panels work.

- URBANST 164: Sustainable Cities
- EARTHSCI/EARTHSYS/EESS 117: Earth Sciences of the Hawaiian Islands
- EARTHSYS 13SC/CEE 11SC/HISTORY 23SC: People, Land, and Water in the Heart of the West
- CEE/EARTHSYS 109: Greening Buildings and Behavior

As students and faculty continue to derive value from practical training, Stanford's environmental curriculum continues to evolve. A list of sustainability-focused and -related courses can be found at the Sustainable Stanford website (http://sem.stanford.edu/sites/sem.stanford.edu/files/documents/oos_sustainability_courses_10-11.pdf).

Looking Ahead

As part of Stanford's long-term strategic sustainability plan (Sustainability 3.0), faculty will further evolve a sustainability curriculum. Academic year 2012–13 marks the first year of a new university-wide undergraduate curriculum as a result of the recommendations from the two-year Study of Undergraduate Education at Stanford. The new curriculum places greater emphasis on interdisciplinary thinking and provides new opportunities for introductory courses that incorporate aspects of sustainability. Faculty and staff also continue to expand the number of hands-on, service-learning courses that solve problems within the university as well as elsewhere in the world. In parallel, many student groups are working to enhance year-to-year continuity and build upon past successes.

Related Snapshot Stories

More Information:

http://www.stanford.edu/dept/undergrad/sues/

http://sustainable.stanford.edu/students

http://environment.stanford.edu/cgi-bin/student_groups.php

Office of Sustainability Programs

Office of Sustainability Programs

The Office of Sustainability serves as the hub of Stanford's sustainability programs (dubbed "Sustainable Stanford"). Rooted in operations, the Office connects various organizations and entities and works collaboratively with them to steer key sustainability initiatives. The Office works in six key programmatic areas: infrastructural planning support; evaluations and assessment; campus communications and publications; behavior-based conservation programs; academic integration; and collaborative governance.

Complementing operational efficiency measures undertaken by campus facilities leaders and staff, the Office creates distinct and education-oriented programmatic initiatives that make sustainability more tangible and visible at Stanford. In its first few years, the office focused on institutionalizing sustainability through basic conservation and communication programs and services. In academic year 2011–12 it has focused on expanding program adoption and fostering new partnerships to build the foundations for a pervasive culture of sustainability.

Evaluations & Assessment—A Solid Gold Rating

Background

Proper assessment of Stanford's success in achieving a culture of sustainability depends heavily on tracking performance metrics and reporting them both internally and externally. The study of collected data informs future direction and program goals. Based on its strong tradition of internal reporting and proven program success, national evaluating organizations continue to recognize Stanford as a leader in sustainability and a benchmark for the higher education community. Since 2008, Stanford has achieved top rankings and led its peers in annual third-party sustainability evaluations such as *Newsweek's* "Greenest Colleges," Sustainable Endowments Institute's College Sustainability Report Card, and *Sierra* magazine's "Cool Schools." These rankings depend on detailed metrics reporting and questionnaire responses compiled by Office of Sustainability staff on behalf of Stanford University.

Results

After the university collated and submitted data from more than 30 departments and organizations—operations, academics, and institutional programs—its overall sustainability performance for 2012 earned a gold rating from the Association for the Advancement of Sustainability in Higher Education (AASHE) under its Sustainability Tracking, Assessment and Rating System (STARS). Of AASHE's 1,100 members, Stanford is one of just 35 to earn this rating, the highest level awarded to date.

As a charter participant in STARS, Stanford engaged in substantive dialogue with AASHE to influence future maturation of the rating system, now the main data source for all third-party sustainability evaluations. Unlike prior evaluations, STARS provides a transparent scoring methodology and a comprehensive view of sustainability across four major categories: Education and Research; Operations; Planning, Administration, and Engagement; and Innovation.

Stanford's submission achieved 68.4 points, exceeding the 65-point threshold for the gold rating.

- In the Education and Research category, the university performed particularly well in the Research subcategory and demonstrated the breadth of its sustainability courses.
- In the Operations category, Stanford was recognized for its Sustainable Food Program, Transportation Demand Management program, and design, construction, and operation of high-performance buildings. As the Stanford Energy System Innovations (SESI) program and other infrastructural improvements come online, this category score will continue to increase.
- In the Planning, Administration, and Engagement category, Stanford earned its highest category score. It received perfect scores in the Coordination and Planning and Diversity and Affordability sections.
- In the Innovation category, Stanford highlighted a wide range of engagement programs that truly set it apart from its peers, including BeWell@Stanford, the interactive water conservation map, Sustainable IT, and the bicycle program.

The current STARS rating remains valid for three years. The Office of Sustainability will continue its annual data collection to promote yearly analysis of metrics and trends and further program development. AASHE is expected to release an update of its rating system in late 2013, and pending evaluation of the revisions, the university will have the opportunity to submit data for a second STARS rating in 2014.

Stanford and its many schools and affiliated entities also participate in or are evaluated by other organizations. Recent achievements, further detailed in the Snapshots section, include the following:

- Stanford ranked third on *Sierra* magazine's "cool schools" list in 2012.
- The Aspen Institute awarded the Graduate School of Business (GSB) a first-place ranking for corporate responsibility and sustainability. Stanford received high marks for the number of courses with social and environmental content, as well as for offering courses that explicitly address the role of mainstream business in improving social and environmental conditions.
- Practice Greenhealth, the health care industry's nationally recognized leader in environmentally responsible operations, awarded the Stanford University Medical Center (SUMC) multiple commendations for green initiatives. SUMC was named a "Partner for Change with Distinction," a designation awarded to "health care facilities that have established environmental programs and continuously improve and expand upon these programs on the path to sustainability."
- In 2012, the Princeton Review's *Guide to Green Colleges* featured Stanford for the third consecutive year.
- Stanford joined Sustainable Endowments Institute's Billion Dollar Green Challenge in October 2011, showcasing investments in energy efficiency upgrades, and was commended for being a leader in this initiative.

Stanford is ranked highly by many third-party organizations.

Stanford earned a gold rating from AASHE's STARS.

Academic Integration and Improving the System

Stanford's approach to STARS and data gathering included steady guidance from faculty partners, from formal presentations and feedback sessions through the Sustainability Working Group (SWG) forum to strategic one-on-one planning sessions. The STARS project could not have succeeded without faculty support as entire sections were dependent on faculty-generated data and consensus.

Stanford has a record of leadership in the evolution of sustainability benchmarking and evaluation for higher education. Upon the release of STARS 1.0 in January 2010, the Office of Sustainability began examining the program and developed a series of recommendations for its improvement. Stanford collaborated with and gained support from the Ivy Plus Sustainability Consortium and the California Higher Education Consortium to bring these opportunities to AASHE's attention. The next iteration of STARS will incorporate the resulting modifications to evaluation techniques and communication.

Looking Ahead

Assessment and evaluation will continue to be a foundational building block of the office's work. The STARS process facilitated the creation of a road map for the improvement of campus sustainability programs. Although the rating is valid for three years, Stanford's program planning has already incorporated many of the best practices and opportunities for improvement highlighted through the process, and implementation will begin as early as this fall, in accordance with Sustainability 3.0. Stanford will continue its relationship with AASHE to ensure that the next version of STARS indeed implements the university's broadly supported recommendations.

Stanford has also begun a deep dive into internal evaluation and assessments to ensure it is performing as expected in key sustainability areas such as energy, water, and waste. In 2012–13, the office is developing a campuswide Existing Building Rating System. The vision for this project merges best practices from the LEED for Existing Buildings: Operations and Maintenance (EBOM) rating system with Stanford-specific metrics to tell a more complete story of building performance on campus. The rating system will incorporate LEED-EBOM criteria for energy and water consumption based upon building-level metering data, the university's waste management data, and Building-Level Sustainability Program components (behavior-based conservation and engagement). The point-based rating will rely on quantitative and qualitative performance metrics.

Related Snapshot Stories

Stanford MBA Program Ranks #1 for Corporate Responsibility and Sustainability 105

Sustainable Stanford Joins Founder's Circle for Billion Dollar Green Challenge 110

Stanford Medical Center Recognized for Green Operations 170

Princeton Review's Guide to Green Colleges Includes Stanford for Third Consecutive Year 171

2012 California Higher Education Sustainability Conference Recognizes Stanford Staff 181

Stanford Earns Gold Rating 184

Stanford Earns Third Place Ranking in Sierra Magazine's "Cool Schools" Survey 190

More Information:

https://stars.aashe.org/institutions/stanford-university-ca/report/2012-06-29/

http://news.stanford.edu/thedish/?p=20095

Behavior Matters—Individual and Institutional

Background

Acknowledging that individual awareness and actions conserve resources, lower utility bills, and contribute to a campus experience consistent with the university's overall commitment to sustainability, the Office of Sustainability offers a range of programs to engage the community. These programs are deliberately delivered in the form of seasonal campaigns to increase awareness of Stanford's sustainability priorities and create real behavioral changes by community members.

The Office also researches and promotes tools and incentives for institutional choices and decision making, because changes at an institutional level are of paramount importance for realizing the full culture of sustainability.

Studies have shown that individuals (whether representing themselves or a department or school) are more motivated to make sustainable choices when provided with hard metrics about the impact of their actions and the decisions of those around them. As a result, the Office's behavior-based programs rest on a metrics-based foundation. The Office works to continually understand and improve delivery and adoption of these programs.

Results

Building-Level Sustainability Program

- The Building-Level Sustainability Program, an individual-action-based resource conservation program, complements efficiency improvement at the infrastructure level and contributes to carbon footprint reduction goals. The program offers interested schools and departments pilot design, audit walk-throughs, a customized "green action menu," and comprehensive building evaluation criteria. The projects to date have resulted in a sustained reduction of up to 20% in office building electricity use with an average payback of just nine months.

- In FY 2012, another 11 buildings fully participated in BLSP. A bulk rollout of the program within Land, Buildings & Real Estate's (LBRE's) Bonair Siding buildings brought the total number of participating buildings to 24, almost one-third of those targeted.
- Previous participants in BLSP continue to achieve savings. The Haas Center for Public Service, a charter participant, took the initiative to develop its own sustainable transportation challenge for employees, detailed in the Snapshots section.

Walk the Walk

In 2011–12, the Office of Sustainability's parent department, LBRE, decided to "walk the walk" and implemented BLSP in nine LBRE buildings across Bonair Siding. This was the largest simultaneous BLSP implementation to date and required significant time investment from office staff. A "Building Champion" from each participating building acted as point person and motivator for his or her colleagues and attended biweekly meetings to touch base on progress. The Office installed nearly 100 timers and over 200 Smart Strips, coordinated occupant-requested delamping with the electrical shop, and launched a pilot office composting program, further detailed in the Snapshots section. The electricity savings contributed to LBRE's overall Energy Conservation Incentive Program (ECIP) performance.

Members of LBRE participated in the BLSP "Caretakers Go Green" campaign.

The Annual Recyclemania campaign encourages campus community members to reduce their waste stream through recycling and composting.

Susan Vargas, manager of Facilities Energy Efficiency, promotes energy savings for the annual winter closure campaign.

Cardinal Green Campaigns

Campuswide "Cardinal Green" conservation campaigns continue to increase institutional awareness of programs to reduce resource consumption. Behavior-based conservation programs with pertinent messaging, attractive incentives, and attainable goals have the potential to yield impressive results. Each campaign focuses on a single topic area and invites active community participation through educational webinars, online pledges, and results-based incentives. The two campaigns presented for the second time during the 2011–12 academic year exceeded their prior year's performance and gained momentum through targeted promotion to the most relevant campus audiences. For the first time, Sustainable Stanford developed an Earth Day campaign that incorporated pledges to complete sustainable actions.

Sustainability Campaign Metrics

Sustainability Campaign	Unit	2010/11	2011/12
Winter Closure			
Utility Costs Avoided	$	202,000	266,000
Participant Buildings		160	168
RecycleMania			
Per Capita Landfilled Waste	lbs/person	115.04	111.52

Heather Benz, sustainability analyst in the Office of Sustainability, demonstrates installation of a Smart Strip.

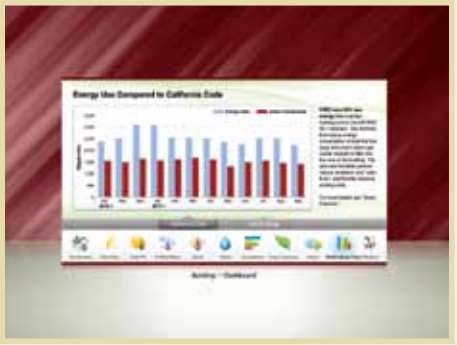
The Tree's Pocket Guide to a Sustainable Stanford is a resource for simple conservation tips and their savings potential.

Other Behavioral Programs

- A behavior-based survey was sent to a small number of randomly selected faculty, staff, and students to obtain baseline information on current individual practices. The results helped define a road map for program development targeting specific individual conservation actions.
- "The Tree's Pocket Guide to a Sustainable Stanford" was created to highlight the many everyday sustainability choices available to the Stanford community, as well as the projected savings if everyone on campus completed these actions. An annual pledge drive will incorporate these key actions and seek to resolve barriers identified through the survey.
- Sustainable Stanford partnered with University Human Resources to implement a green move for the department.
- BeWell, Stanford's comprehensive health and wellness initiative, featured Sustainable Stanford on its website and at campus events to promote the connections between wellness and sustainability.

Academic Integration

There is a strong synergy of behavior-based conservation programs with academic efforts. For example, the office collaborated with Woods prior to the launch of BLSP as a platform for Stanford's schools and departments to educate occupants and implement sustainability practices at the building level. The CEE/ES 109 class provides a conduit for student interns to join the Office and help support BLSP implementation. This practical application of academic knowledge creates a two-way flow of information that is vital for future program development.



UMBRS will add further information to existing building energy dashboards campuswide.

As the Cardinal Green campaign series continues to evolve, the office will incorporate findings from the latest research and best practices in promoting behavior change, drawing on the work currently happening across campus from PIE, Precourt Energy Efficiency Center, d.school, and the GSB.

Looking Ahead

During the creation and implementation of behavior-based programs, it was observed that sustainability metrics do not yet fully influence the strategic decisions made by schools and departments. Stanford's ECIP provides an electricity allocation and financial incentive for conservation, but no holistic mechanism provides a diagnosis or solution package across many parameters. The Office of Sustainability is planning to proactively deliver schools and departments an annual performance report card on a wide variety of sustainability topics, from energy use to behavior-based program participation. The goal is to influence both institutional decision making and individual behavior, working towards greater understanding and adoption of initiatives and conservation programs. A key component of the report card will be the Existing Building Rating System discussed previously.

The report card will be provided as both a PDF and a component of the sustainability dashboard. This dashboard is a key deliverable of the Utilities, Metering, Billing, Reporting & Sustainability (UMBRS) initiative started in Sustainability and Energy Management (SEM) in 2012 and expected to come online in academic year 2014–15. As the university approaches an era of heightened awareness of and interest in the efficient use of resources, SEM will require an enterprise-level business information system that keeps pace with the self-serve reporting and analytic needs of a broad group of stakeholders.

The UMBRS project will address immediate and long-term information system needs. It will also report comparative sustainability metrics and performance information at a school or building level via an easily understandable and navigable reporting and display mechanism.

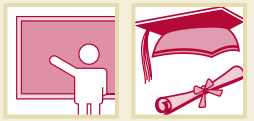
Related Snapshot Stories

More Information:

http://sustainable.stanford.edu/be_cardinal_green

http://sustainable.stanford.edu/building_level_sustainability

Communications & Publications



Background

A campus culture of sustainability cannot be created without widespread awareness of Stanford's sustainability plans, programs, and achievements. The Office of Sustainability works to promote existing sustainability programs and to publicize campuswide sustainability actions through a variety of communication and publication channels.

Results

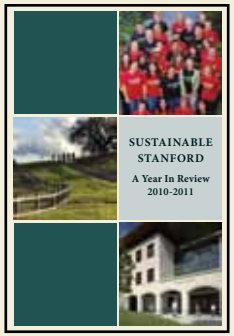
The Sustainable Stanford website provides a single source of information on sustainability work across campus. The website includes extensive information on campus metrics, trends, and initiatives, as well as details on how individuals can get involved.

Since 2008, the Office of Sustainability has published this annual document highlighting sustainability achievements from the past year. The document is released online and printed each fall for limited distribution to key stakeholders and at signature events. In 2010–11 the office expanded the annual report to include campus sustainability metrics and trends. The report continues to be the office's flagship publication. In addition, *Cardinal Green*, the Sustainable Stanford quarterly newsletter, provides an ongoing forum for sustainability teams and topics, and promotes sustainability activities throughout the community.

The department has engaged in on- and off-campus community outreach and university-wide academic and administrative programs and events related to sustainability. This year, for example, Sustainable Stanford:

- Was featured on ESPN.com, as further detailed in the Snapshots section.
- Served on the steering committee for and presented at the Sustainable Corporations Summit, the Society for College and University Planning (SCUP) Pacific Regional Conference, and the California Higher Education Sustainability Conference.

- Presented on various sustainability topics at the 2011 AASHE Conference.
- Met with representatives from other universities to share knowledge. In October 2011, the Office for a Sustainable Campus at Japan's Hokkaido University invited representatives from Stanford and several other PAC-12 schools to present at the International Symposium on Creation of Sustainable Campuses.
- Hosted student town hall meetings to discuss campuswide sustainability initiatives and offered weekly office hours to support students interested in sustainability.
- Presented at numerous faculty- and student-led classes related to the environment and sustainability.
- Offered sustainability tours at the annual Reunion/Homecoming and Parents' Weekend events.
- Provided information to community members at the Parents' Weekend Resource Fair, the Wellness Fair, Healthy Taste of Stanford, and other fairs.
- Maintained a strong presence during New Student Orientation by staffing tables at a variety of events, including the resource fair during Residential Advisor training, the New Student-Athlete Orientation dinner, and the Engineering Student Services Fair.



The annual Year in Review publication provides detailed information about sustainability achievements across the university.

Representatives of Stanford University visited Hokkaido University for the International Symposium on Creation of Sustainable Campuses.

Academic Integration

All campus communications and publications on sustainability are heavily influenced by and consciously integrated with the Office of Sustainability's academic partners in the School of Earth Sciences, Stanford Woods Institute for the Environment (Woods), the Precourt Institute for Energy (PIE), the Haas Center for Public Service, and their affiliates. Highlights from the 2011–12 academic year include the following:

- In May 2012, the Office of Sustainability hosted Celebrating Sustainability, the first campus sustainability event jointly sponsored by academic and operational entities. Achievements of the past as well as an outlook for the future were shared during the event, which served as the culmination of Sustainability 3.0, the recent collaborative planning effort undertaken to identify a shared and actionable vision for sustainability in the coming years. The program included a welcome by School of Earth Sciences Dean Pamela Matson and LBRE Vice President Bob Reidy; a keynote address by Stanford trustee Thomas Steyer; a "Transformative Research, Curriculum, and Action" panel discussion; and a presentation on the next steps in leading sustainability by action. Closing remarks were presented by Provost and Acting President John Etchemendy and were followed by a zero-waste reception in Rehnquist Courtyard.
- Keys to Sustainability at Stanford served as an opportunity to educate students about the variety of sustainability offerings in research, academics, and extracurricular activities. Now an annual event, it was offered for the first time in October 2011 and attracted 200 students. It was cosponsored by the Office of Sustainability, Woods, the School of Earth Sciences, and PIE.

Members of the Office of Sustainability staff informational tables at a variety of events.

Thomas Steyer, Stanford trustee, spoke at May's Celebrating Sustainability event.

Looking Ahead

The office expects to continue all of its communications and publications, as they are fundamental to its campus presence. Future communications will look to strengthen existing engagement campaigns through programs, incentives, and promotion. Also, the office expects to launch a formal sustainability awards program to highlight individual and team achievement, presenting the awards each year during the spring sustainability event.

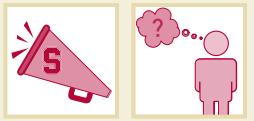
In response to the popularity of the campus sustainability tour, currently offered during select major events, a virtual, self-guided version of the tour is in development for campuswide distribution. This tour will be available online and on mobile devices and will include audio, text, links, and photos for each of its many stops. This enhancement will allow far more people to learn about sustainability on campus.

Related Snapshot Stories

More Information:

http://sustainable.stanford.edu/publications_and_reports

Sustainability Training



Background

Students are the most important stakeholders on campus. Their learning experience and direct engagement in sustainability are crucial to creating a culture of sustainability at Stanford. The Office interacts with faculty and students to design and implement training and engagement opportunities so hand-on experience in sustainability is integrated into the students' overall learning experience at Stanford. This is accomplished through projects, events, classes, and student internships. The training and education programs strive to incorporate academic rigor into them and complement lessons learned in the classroom.

Results

In academic year 2011–12, formal educational internships and weekly office hours continued to provide a steady communication platform for various student groups and allowed sustainability staff to offer strategic guidance to students. Additional academic integration activities included the following:

- Sustainable Stanford updated the "Student's Guide to Sustainable Living at Stanford" and distributed it electronically to the incoming class of 2015. A special note from the dean of freshmen encouraged the class to adopt sustainable lifestyles in accordance with Stanford's goal to achieve a culture of campus sustainability. The Office of Sustainability has been offering resources and information to incoming students since 2008 and continues to value making connections with the newest members of the Stanford community.
- The Office of Sustainability and the Stanford Woods Institute cosponsored Civil and Environmental Engineering / Earth Systems 109 for the third time during the winter quarter of the 2011–12 academic year. The first overarching local sustainability course offered by Stanford, CEE/ES 109 aims to engage students in employing practical sustainability within an institution. It features numerous Stanford faculty and staff who lecture

CEE/ES 109 provides a hands-on approach to building energy efficiency.

In CEE/ES 109, students carry out their own plug-load and water audit.

on topics that include energy efficiency, water use, waste management, sustainable food, and transportation systems. In 2011, the class was listed in the Environmental Protection Agency's "Green Careers Curriculum Manual." Each year the class examines one building on campus as a case study. This year the John A. Blume Center for Earthquake Engineering was selected. Based on class lectures and on-site sustainability audits, students gave final presentations to the building manager on ways to reduce energy use, water use, and waste in the building. The Blume Center has implemented many of the student recommendations to make its operations more sustainable.

- Having completed its fourth year, the Student Green Fund continues to foster student engagement by encouraging leadership in sustainable improvement projects on campus. The fund awarded almost $30,000 in grants to projects addressing location-based landscape water conservation, solar panels on student housing, a student-led building dashboard, green events, and rainwater harvesting. Past projects also continue to benefit campus sustainability. Examples include the Campus Garden Initiative, which continues to install and maintain vegetable gardens at many student houses; the Campus Outdoor Recycling Project, which developed new, easy-to-understand labels that can now be found on all recycling, composting, and waste bins on campus; and Union Underground, a student-run thrift store to encourage reuse and repurposing of clothing and other items.

2011–12 Green Fund Projects

A final report detailing all 2011–12 projects is publicly available online. Reports from each year provide a database of previous projects to inspire students to build upon past successes and enable them to learn from their predecessors. This year's projects reached across the university to tackle sustainability in a variety of forms, as described below:

Sustainability and Energy Dashboard Initiative

A building dashboard that provides interactive, real-time energy monitoring and visualization was installed at Tresidder Memorial Union. The dashboard monitors and displays the energy consumption of individual vendors in Tresidder at three separate video kiosks, increasing the visibility and awareness of on-campus energy consumption and providing feedback to spur reductions.

Conservation Cup Water Wars

Florence Moore Hall, an undergraduate student residence, was equipped with Aquacue's hourly water consumption tracking technology. The Green Living Council used the technology as a tool to reduce water consumption through a competition between dormitories in the residence. During the competition, dorms lowered water consumption by 7,300 gallons.

Storey House Real-Time Energy and Water Metering

Now equipped with real-time monitoring of water and electricity usage, Storey House has become one of the greenest dorms at Stanford. In 2008 the Green Fund supported the installation of electricity-monitoring equipment in combination with a dashboard to display the data. Four years later, this system has been upgraded to include water. A new touch screen dashboard on display in the residence complements the online dashboard.

Green Events Consulting

A previous recipient of a Green Fund grant, Green Events Consulting advises student groups on how to make events more environmentally friendly. In 2011–12 the group received additional funding to continue its work and advised 14 separate events, including A Taste of Palo Alto and Relay for Life. The group also developed a new express consulting division.

Final results of the Water Wars competition.

Students installed a real-time energy monitoring and visualization system at Tresidder Memorial Union.

Water Mobile App

Students designed and developed an iPhone app to report irrigation leaks on campus. Reporting categories include misaligned or broken sprinklers and broken pipes. The app is in the final stages of development necessary before its official rollout. Eventually, it may be expanded to serve as a resource for reporting other maintenance needs across campus, such as downed tree branches or overflowing waste bins.

Farm to Fork Dinner Series

A dinner and workshop series brought together students and faculty to foster an open dialogue on the future of food and agriculture and educate the Stanford community about the environmental, social, and health concerns tied to the food system. Events included local-food potlucks, cooking demonstrations by Stanford chefs, and dinner discussions with agricultural activists.

Synergy Rainwater Harvesting System

Based on the successful installation of a rainwater catchment system at Columbae's garden last year, students are working to install a similar system to irrigate Synergy's vegetable garden, which provides food for the house. The project is currently in progress as Synergy undergoes a renovation.

Sustainability 3.0 Student Focus Groups

In conjunction with the Sustainability 3.0 strategic planning process, students developed a survey to gauge student opinions on campus sustainability. Through extensive outreach, the survey received over 900 responses and provided a valuable data set of student priorities and expectations. Survey results informed the Sustainability 3.0 planning process.

The Farm to Fork series brought a variety of speakers to campus to provide interactive workshops on food topics.

Members of the 2011–12 Green Fund with Office of Sustainability staff.

Looking Ahead

Working together with academic entities, the Office of Sustainability looks forward to providing additional opportunities for practical training and education to the Stanford community. Examples of future plans include designing staff, faculty, and student online training modules on sustainability programs and behavior-based engagement. Plans are in place to pilot practical training options through HR for all employees and students on simple energy, water, and waste audits. Training will highlight where to find tools and information, and completion of training will be tied to incentive and award programs.

The office will modify the Student Green Fund and its offerings over the coming year. Four years of data show that students, when given the proper resources, can develop strong and meaningful projects. To provide more support and resources for student success, the fund will be redeveloped to include an academic component and a strengthened advising and support system for awardees.

Related Snapshot Stories

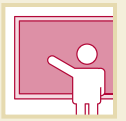
New Course Explores Water in the West 99
Fourth Year of Student Green Fund Grants 116
DC Bootcamp Trains Graduate Students to Influence Environmental Policy 150
Green Living Council Improves Dorm Sustainability 164

More Information:

http://sustainable.stanford.edu/green_fund

http://sustainable.stanford.edu/be_cardinal_green

Collaborative Governance at the Core



Background

Forging relationships with other administrative departments, faculty, and students and engaging in community outreach to advance sustainability in support of the university's mission of education, research, and outreach are guiding principles of Stanford's sustainability program. Pervasive values like sustainability thrive through collaborative governance, especially in a large institution like Stanford. Following are the key dimensions of this governance, which enables hundreds of faculty and staff to support the university's sustainability mission.

Sustainability Working Group (2006)

The SWG prepares policy and program recommendations to advance and implement sustainability practices on campus. Chaired by the director of the Office of Sustainability and comprising representatives from all parts of the university, the SWG meets monthly. Its mission is to:

- Continuously improve Stanford's leadership in demonstrating environmental sustainability in campus operations.
- Incorporate faculty, staff, and student expertise in the evolving field of sustainability to enhance program development.
- Advance opportunities for hands-on sustainability-related learning and service in the campus community.

Sustainability Working Teams (2008)

The Sustainability Working Teams (SWTs) assembled in 2008 to develop program recommendations, assess progress, and help implement policy recommendations in major operational areas related to sustainability. The teams are composed of campus subject matter experts, representatives from key Stanford community groups, and individuals with authority to take action in the relevant operational areas. Each team activates when a specific initiative is under way and may be dormant once a project has been implemented.

At the Celebrating Sustainability event, panelists discussed incorporating sustainability into campus research and teaching (left) and campus life and operations (right)

Academic Integration

Collaborative governance naturally aligns with academic integration. Through diverse and interdisciplinary forums such as the SWG and SWTs, where faculty actually engage, as well as projects such as the greenhouse gas task force, conferences, events, and regular sharing of information, Sustainable Stanford increases its collaboration with academia.

Results

In academic year 2011–12, the SWG met nine times, exchanging ideas and conducting major programmatic reviews. Frequent topics included sustainability assessment programs, behavioral initiatives, the status of the SESI program, and various new initiatives that thrive on interdepartmental coordination and support. All agenda topics are available online

Another example of collaborative governance occurred during the 2012 Society for College and University Planning (SCUP) Pacific Regional Conference, "Leadership for the 21st-Century Campus," held at the Stanford University Medical Center. The sold-out conference organized by the School of Medicine, university architect's office, and various entities, was the largest regional SCUP conference ever, with close to 500 participants. Sustainability topics were featured throughout the program, including sessions on transportation, energy, housing, building systems, and landscape, as well as an array of campus tours.

Dean Pamela Matson (center) convened the Sustainability 3.0 steering committee in June 2011.

Provost and acting President John Etchemendy commented on the Sustainability 3.0 plan in his closing remarks at the Celebrating Sustainability event.

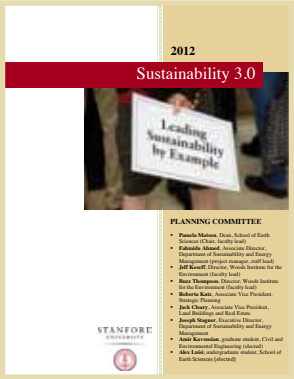
Sustainability 3.0: Leading Sustainability by Example

Starting in 2011, a consortium of senior faculty, operations staff, and student leaders in campus sustainability worked to develop Sustainability 3.0, a strategic plan to expand and enhance that sustainability over the next five to ten years. The goal was to outline a shared and actionable vision for making sustainability a core value through teaching, research, and action. The committee met with stakeholders across the university to examine its sustainability successes and identify opportunities for enhancement.

The result was a blueprint for the future of sustainability at Stanford. Major goals include leading sustainability by example through on- and off-campus actions, and maintaining a global influence through sustainability in research, education, and operations. To achieve these goals, the committee unveiled four key strategies:

- Ensure that sustainability is a top and lasting priority for Stanford in research, teaching, and action.
- Establish clear policies for implementing, monitoring, and achieving sustainability in every part of campus.
- Educate and train the Stanford community to work towards sustainability goals and build a fully committed and engaged community.
- Reach beyond Stanford to influence sustainability research, education, and action elsewhere.

Descriptions of specific actions under each strategy are available to members of the Stanford community.



Sustainability 3.0 provides a comprehensive plan for the next steps in campus sustainability.

The committee shared the Sustainability 3.0 planning outcomes with the university community at the Celebrating Sustainability event held on May 7, 2012, unveiling the goals, strategies, and actions that will guide sustainability at Stanford in future years.

Looking Ahead

Sustainability 3.0 is now in the implementation phase. An executive committee of deans, institute leads, and senior campus leadership, the Provost's Committee on Sustainability, will formally convene starting in the 2012–13 academic year. The committee will facilitate collaboration across schools, institutes, the Office of Sustainability, and students; exert leadership across campus; and implement leadership recommendations. All of the best practices in the current sustainability curriculum and programs will continue and be enhanced as the campus moves forward with a renewed sense of purpose on sustainability and its lasting impacts.

Related Snapshot Stories

University Planning Conference Promotes Sustainability 142
Stanford Celebrates Sustainability Achievements and Unveils Future Plans 163
Trustees Enact Energy Efficiency Proxy Voting Guidelines 179

More Information:

http://sustainablestanford.stanford.edu/governance

http://sustainable.stanford.edu/celebrate

http://sustainable.stanford.edu/swg_agendas

Sustainability at Stanford
A Year in Review
2011–12

Recognition & Awards

Recognition & Awards

Stanford's long history of sustainability-focused operations and academic research has been recognized by regional, national, and international organizations. The spectrum of Stanford's awards and commendations highlights the multifaceted nature of sustainability and spans a wide range of topics. Presented below are selections of the most significant campus sustainability initiatives to receive formal recognition.

Third-Party Evaluations of Sustainable Stanford

Gold Rating, Sustainability Tracking, Assessment, and Rating System, the highest overall campus sustainability rating level awarded to date by the Association for the Advancement of Sustainability in Higher Education (2012)

***Sierra* Magazine "Cool Schools**," third place (2012); fifth place (2010 and 2011); A- grade and 26th place (2009)

Sustainable Endowments Institute, top-tier ranking as an Overall College Sustainability Leader on College Sustainability Report Card (2007, 2009, 2010, and 2011)

***Newsweek* Magazine's Greenest Schools**, second place in a composite of Sustainable Endowments Institute, *Sierra* magazine, and other rankings (2011)

U.S. Green Building Council and Princeton Review's Guide to Green Colleges, ranking among the best of more than 700 colleges and universities surveyed (2010, 2011, and 2012)

Sustainability Champion Best Practice Award, for Fahmida Ahmed, Office of Sustainability Director, California Higher Education Sustainability Conference (2012)

Buildings

First Place, ASHRAE Technology Award, for the Environment and Energy Building (Y2E2) in the new institutional building category (2011)

Design Award of Excellence, for Stanford Law School, William H. Neukom Building, Society of American Registered Architects (2011)

Green Project of the Year, for Graduate School of Business, Knight Management Center, Silicon Valley Business Journal (2010)

Top Ten Green Projects, for Carnegie Institution's Global Ecology Research Center, American Institute of Architects Committee on the Environment (2007)

Best Green Building in the Bay Area, for Y2E2, San Francisco Business Times (2008)

Leadership in Applying Green Building Design, for Stanford Dining, PG&E (2006)

Top Ten Green Projects, for Leslie Shao-Ming Sun Field Station at Jasper Ridge Biological Preserve, American Institute of Architects Committee on the Environment (2005)

Energy & Sustainability Award, for Jasper Ridge Field Station, American Institute of Architects, San Francisco Chapter (2005)

Energy

Project Awards

Honorable Mention, ASHRAE Technology Award, for Stauffer Building I laboratory variable air volume (VAV) conversion in the existing institutional building category (2010)

Honorable Mention, Flex Your Power Awards (2005)

Project Rebates from PG&E

Knight Management Center, $192,339 rebate (2012)

Nanoscale Science and Engineering, $17,588 rebate (2012)

Huang Engineering Center, $30,092 rebate (2012)

Green Library Bing Wing HVAC Retrofit, $181,518 rebate (2011)

Beckman Center Laboratory VAV Conversion, $632,505 rebate (2011)

Gilbert Biology Laboratory VAV Conversion, $709,808 rebate (2011)

Psychiatry Academic & Clinic Building Lighting Retrofit, $10,786 rebate (2011)

Cantor Art Center Retrofit, $122,000 rebate (2011)

Alumni Center Window Film Installation, $11,000 rebate (2011)

Parking Structures 2 and 6 Lighting Retrofit, $13,000 rebate (2010)

Y2E2 Photovoltaic Installation, $38,000 rebate (2009)

Avery Aquatic Center Pump Retrofit, $110,000 rebate (2009)

Business Continuity Data Center, $48,000 rebate (2009)

School of Medicine Server Virtualization, $8,988 rebate (2009)

Stauffer Building II Laboratory VAV Conversion, $110,000 rebate (2008)

Desktop Power Management, $55,000 rebate (2008)

Stauffer Building I Laboratory VAV Conversion, $180,000 rebate (2007)

Reservoir 2 Photovoltaic Installation, $135,000 rebate (2004)

Food

Second Place Sustainability Award for Education and Outreach, for Stanford Dining, National Association of College & University Food Services (2012)

Distinguished Guests, Sustainable Food Showcase, Cooking for Solutions, Matthew Rothe, Sustainable Food Program coordinator, and Andrew Mayne, Stanford Catering Executive Chef, Monterey Bay Aquarium (2011 and 2012)

Judge, Acterra Sustainability Awards, Matthew Rothe, Sustainable Food Program Manager (2011 and 2012) and Eric Montell, Executive Director of Stanford Dining (2008–2010)

Finalist, Real Food Challenge Administrator or Faculty Member of the Year Award, Matthew Rothe, Sustainable Food Program Manager (2011)

Sourcing Sustainable Seafood Panelist, National Restaurant Association, Eric Montell, Executive Director of Stanford Dining (2011)

Business Environmental Award, for Stanford Dining, Acterra (2007)

Special Congressional Recognition, for Stanford Dining, Congresswoman Anna Eshoo (2007)

Green Business Certification, Stanford Dining, one of the first such certifications for a university food service operation in the United States, Santa Clara County (2004)

Land, Landscape, and Grounds

Certificate of Recognition, for the student group SEEDS and its work to protect the fragile environment around Lagunita, Ecological Society of America (2012)

Merit Award, with Boora Architects, for the Science and Engineering Quad, Planning for a District or Campus Component, Society for College and University Planning (2010)

Preservation Design Award, for Stanford Arizona Garden, California Preservation Foundation (2008)

Governor's Historic Preservation Award, for faculty houses, historic houses project category, State of California (2007)

Community Partnership Award, for oak tree planting for the second hundred years, California State Senate (2006)

Special Recognition, for oak reforestation project partnership, U.S. Congress (2006)

Seismic Strengthening & Historic Restoration Award, National Trust for Historic Preservation (2001)

Design Award, for stabilization and preservation of the Frank Lloyd Wright–designed Hanna House, California Preservation Foundation (2001)

Merit Award, for the Department of Athletics, Physical Education, and Recreation Plan, American Society of Landscape Architects (1999)

Merit Award, for Palm Drive restoration, American Society of Landscape Architects (1995)

Research (Stanford Woods Institute Faculty Awards)

Barbara Block wins award for marine monitoring: Stanford Woods Institute Senior Fellow Barbara Block, the Charles & Elizabeth Prothro Professor in Marine Sciences at Stanford, received a Rolex Award for Enterprise for her plan to monitor large predators off the coast of California. (June 2012)

Steven Gorelick elected to National Academy of Engineering: Steven Gorelick, the Cyrus F. Tolman Professor in Environmental Earth System Science and senior fellow at Stanford Woods Institute, was one of 66 new members elected to the National Academy of Engineering. (February 2012)

Gretchen Daily wins Prince Albert II Biodiversity Award: Gretchen Daily, the Bing Professor in Environmental Science and senior fellow at the Stanford Woods Institute received the biodiversity award given annually by the Prince Albert II of Monaco Foundation. (October 2011)

Faculty receive grant to study solar plants: Stanford Woods Institute Fellows Chris Field, Noah Diffenbaugh, and David Lobell received a grant from the TomKat Center for Sustainable Energy and the Precourt Institute for Energy at Stanford to study the effects of large solar plants on land and water resources in the American Southwest. (September 2011)

Transportation

Platinum-Level Bicycle Friendly University, League of American Bicyclists (2011–2015)

Best Workplaces for Commuters, U.S. Environmental Protection Agency/ Center for Urban Transportation Research at the University of Florida (2002–2012)

Gold Prize, Race to Excellence, U.S. Environmental Protection Agency/Center for Urban Transportation Research at the University of Florida (2006, 2009, 2010, and 2011)

Best of Universities and Colleges, Race to Excellence, U.S. Environmental Protection Agency/Center for Urban Transportation Research at the University of Florida (2006 and 2011)

Innovative Transportation Solutions Award, Women's Transportation Seminar, San Francisco Bay Area Chapter (2009)

Excellence in Motion, Award of Merit, Metropolitan Transportation Commission (2008)

Gold-Level Bicycle Friendly Community, League of American Bicyclists (2008–2012)

Bicycle Friendly Community, League of American Bicyclists (2003–2007)

Green Business Award, for Stanford Fleet Garage, recognizing commitment to environmentally responsible operations, County of Santa Clara (2004–2007)

Leadership Award, for nonelected individual or private organization, Association for Commuter Transportation (2006)

Top 50 Award, for regional transportation, employer category, Bay Area Council (2004)

Certificate of Special Congressional Recognition, for alternative transportation (1997, 2004)

Commendation, for alternative transportation, County of Santa Clara (1997, 2004)

Business Environmental Award, Acterra (2004)

Clean Air Award, Breathe California, formerly American Lung Association of the Bay Area (2003)

Certificate of Appreciation, Bay Area Air Quality Management District (2002)

Founding Member, U.S. Environmental Protection Agency/Department of Transportation Commuter Choice Leadership Initiative (2001)

Waste

RecycleMania Results

2012: top 30 in six of the eight categories: per capita (28); gorilla (9); paper (16); cardboard (14); bottles and cans (19); and food waste (14)

2011: top 20 in six of the eight categories: per capita (16); gorilla (2); paper (11); cardboard (12); bottles and cans (16); and food waste (17)

2010: top 25 in six of the eight categories: per capita (21); gorilla (3); paper (11); cardboard (20); bottles and cans (23); and food waste (6)

2009: top 20 in five of the eight categories: per capita (16); gorilla (3); paper (9); cardboard (17); and food waste (6)

2008: top 10 in six of the eight categories: per capita (7); gorilla (1); paper (5); cardboard (8); bottles and cans (10); and food waste (8)

2007: top 20 in six of the eight categories: per capita (14); gorilla (2); paper (3); cardboard (9); bottles and cans (18); and food waste (13)

Program Awards

College/University Recycling Award, American Forest and Paper Association (2009)

Environmental Achievement Award, for Environmental Health and Safety battery recycling and mercury thermometer replacement program, Environmental Protection Agency (2002)

Outstanding School Program Award, National Recycling Coalition (2002)

Water

Silicon Valley Water Conservation Award, large organization category (2009)

Clean Bay Business Award, for Stanford Golf Course Maintenance Shop and Stanford Fleet Garage and Service Station, Palo Alto Regional Water Quality Control Plant (2001–2012)

Leadership Recognition, for eliminating use of antibacterial soaps, Palo Alto Regional Water Quality Control Plant (2007)

Santa Clara Valley Urban Runoff Pollution Prevention Program Award, for site design for storm water pollution prevention at Stanford Stadium (2007)

Sustainability at Stanford
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A Chronological Snapshot

The chronological snapshot stories that follow not only provide details on many of the featured topics, they also underscore the steady pulse of sustainability on campus. Some initiatives are bold and ambitious, while others are grassroots. Some programs are intended for long-term implementation, while others concluded this year. However, all are strategic and collaborative parts of Stanford's integrated and flourishing culture of sustainability.

New Course Explores Water in the West

Twelve Stanford students had the opportunity to learn about the complexity of water rights in the West in a unique format—a two-week rafting trip down the Colorado River. Offered through Stanford's Sophomore College, the course immersed students in the environmental, political, and social issues surrounding water use and distribution in the western United States. Lectures were given on rafts, in canyons, and under the stars as the group made its way over 225 miles of river through the Grand Canyon. Students examined a variety of case studies illustrating the results of conflicting interests in water, such as tensions between the United States and Mexico, legal disputes between the U.S. government and the Hualapai tribe, and ecological damage from extensive damming. Students uniformly loved the course, cosponsored by the Stanford Woods Institute for the Environment and the Bill Lane Center for the American West. Both the Water in the West program and the new class are examples of Stanford's nontraditional approach to engaging students in the greater world and represent the type of opportunity that will proliferate as Stanford's environmental curriculum continues to grow.

Related Topic: Training and Education

More Information:

http://alumni.stanford.edu/get/page/magazine/article/?article_id=46405

http://waterinthewest.stanford.edu

http://west.stanford.edu/students/sophomore_college

First Comprehensive Energy Summit for Incoming Graduate Students

More than 120 incoming Stanford graduate students were able to jump-start their Stanford careers at the inaugural Energy@Stanford & SLAC summer conference, held September 12–16. Students learned about the broad range of energy research on campus, met energy faculty, discovered research opportunities, and networked with other graduate students interested in energy technology and policy. The conference highlighted Stanford's interdisciplinary connections through more than 30 presentations on energy topics. "Our goals are to show both incoming and current grad students the breadth of research going on at Stanford and SLAC and to help these students develop an interdisciplinary network of colleagues who are also interested in energy," said Zhi-Xun Shen, SLAC chief scientist. Students came away from the event with new ideas about how to make the most of their time at Stanford. "In just a week, I got a taste of all the opportunities available in energy research across all fields—be it pure science, engineering, economics, or policy. I would not have figured all this out on my own in a full year of taking courses," said one. Because of the success of this event, it is now an annual offering.

Related Topic: Interdisciplinary Research

More Information:

http://pie.stanford.edu/EnergyClassFall2011.html

Sustainable Stanford Educates New Students about Sustainability

Sustainable Stanford maintained its strong presence during New Student Orientation by staffing tables at a variety of events, including the resource fair during Residential Advisor training, the New Student-Athlete Orientation dinner, and the Engineering Student Services Fair. For the first time, staff presented Stanford's sustainability story during an open-invite event that concluded New Graduate Student Orientation. Staff distributed copies of "A Student's Guide to Sustainable Living at Stanford," which provides practical sustainability tips for students as well as information about other resources specific to student life. Online copies of the guide were emailed to all incoming freshmen over the summer with a special note from the dean of freshmen encouraging the new class to adopt sustainable lifestyles in accordance with Stanford's goal to encourage a culture of campus sustainability. The Office of Sustainability has been offering resources and information to incoming students since 2008.

Related Topic: Communications and Outreach

More Information:

http://sustainable.stanford.edu/students

New Dust Collector Improves Building Efficiency

Stanford's operations staff take every opportunity to improve building efficiency and help the campus run more smoothly. Zone Management staff needed to replace the dust collector in the Mechanical Engineering building after a fire severely damaged the old equipment. Taking advantage of the situation, the team added energy efficiency measures to the renewal project. Campus staff installed premium-efficiency motors and a Smart Flow control system for demand-based dust collection. Individual gates were installed to operate the dust collection based on load at each tool work station, thereby increasing ventilation system capacity while reducing energy use. This efficiency project will save 11,280 kWh annually. Stanford's Energy Retrofit Program supports projects like this one to improve building efficiency across campus. Since 2002, the program has saved over 176 million kWh, enough to power campus for eight months. Stanford continues to look for new efficiency projects that in combination have a substantial campus impact.

Related Topic: Energy Efficiency

More Information:

http://sustainable.stanford.edu/energy_initiatives

Leading Research: NSF Launches Stanford-Led Water Center

Addressing America's looming urban water crisis, the National Science Foundation (NSF) has established a new Engineering Research Center dedicated to reimagining the nation's urban water infrastructure. As summarized in the Stanford Report, the Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt) is led by Stanford University and includes researchers trained in environmental engineering, earth sciences, hydrology, ecology, urban studies, economics, and law from Stanford, the University of California–Berkeley, the Colorado School of Mines, and New Mexico State University. "Urban water represents a monumental challenge for the United States, and it deserves concerted research and thinking on the grandest scale," said project leader Richard Luthy, a professor of civil and environmental engineering and senior fellow at the Stanford Woods Institute for the Environment. "We'll be developing new strategies for replacing crumbling infrastructure, new technologies for water management and treatment, new ways to recover energy and water, and more—much of it yet to be determined." The multifaceted research center represents a critical initial step in responding to America's water challenges.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2011/july/urban-water-infrastructure-072011.html

http://urbanwatererc.org/

Best Performance in Sustainable Demolition

Construction and demolition debris recycling has been a common practice at Stanford since 2008 and has contributed to Stanford's 64% waste diversion rate. The university demonstrated its commitment to reducing construction waste most recently through the sustainable demolition of the Frederick E. Terman Engineering Center. Completed in 1978, the Terman building incorporated many leading-edge sustainability features for the time, making it only fitting that its useful life end with leading-edge recycling, reclamation, and reuse efforts. Stanford used a balanced approach to evaluate material salvage opportunities, weighing the feasibility and likelihood of reuse of various building elements against recovery cost, schedule, and impacts to the surrounding community. Material unfit for salvage was recycled, on site where feasible. These efforts diverted 99.6% of the demolished building from the landfill. After the demolition, an amphitheater-like park and recreation space was developed on the site, incorporating lawn seating, accessible pedestrian ramps, and terraces. Conscientious building demolition underscores Stanford's commitment to sustainability and demonstrates responsible management through the end of a building's life.

Related Topic: Waste Minimization

More Information:

http://sustainable.stanford.edu/sustainable_demolition

Stanford MBA Program Ranks #1 for Corporate Responsibility and Sustainability

Stanford's Graduate School of Business (GSB) continues to be recognized as a leader in business education. In September, the Aspen Institute awarded Stanford's MBA program a first-place ranking for corporate responsibility and sustainability. Stanford received high marks for the number of courses it offers with social and environmental content, as well as for offering courses that explicitly address the role of mainstream business in improving social and environmental conditions. It was also recognized for creating an environment in which faculty feel free to explore social and environmental topics in their research. The GSB modified its curriculum in 2009 to involve more experiential learning and hands-on, service-learning courses with real-world impact. The new program pushes students to think more deeply about their responsibility to improve the world.

Related Topic: Assessment and Evaluations

More Information:

http://www.beyondgreypinstripes.org/school/stanford-graduate-school-business

http://www.businessweek.com/bschools/blogs/mba_admissions/archives/2011/09/stanford_tops_green_mba_ranking.html

Reunion Weekend Sustainability Tour Continues to Attract Capacity Crowds

Stanford's Sustainability on the Farm tour continues to be a popular attraction for returning alumni. In its third year, the Reunion Homecoming Weekend tour aboard one of Stanford's diesel-electric hybrid Marguerite shuttles was filled to capacity. Tour participants visited the new Science and Engineering Quad, the Arrillaga Family Dining Commons (AFDC), and the Stanford Recycling Center. Along the route, staff from various departments provided information on sustainability initiatives such as landscaping, transportation, energy efficiency, water conservation, and waste reduction. Alumni of all ages were impressed with Stanford's commitment to sustainability. The tour's continued popularity has made it a staple of major campus events, and a self-guided version is currently in development.

Related Topic: Communications and Outreach

More Information:

http://sustainable.stanford.edu/events

New Dining Commons Features Sustainability

Stanford students celebrated the opening of the award-winning Arrillaga Family Dining Commons (AFDC), the first new campus dining hall in nearly two decades. Besides winning first place in the Montague Suite Dreams Design Challenge, the state-of-the-art dining hall is on the cutting edge of culinary education, with initiatives such as Performance Dining and a gluten-free pilot program. The dining hall features a special learning kitchen designed to bring students closer to their food through cooking demonstrations and a newly developed curriculum. Sustainability is a centerpiece of the dining commons; features include an advanced building envelope to reduce heating and cooling needs, energy- and water-efficient equipment, and large windows that let in natural daylight. The grounds of the dining hall are planted with native and drought-tolerant plants, and bioswales control runoff. The dining commons also features an experimental garden that is maintained with biodynamic techniques. AFDC quickly became the most popular dining hall on campus, with demand far exceeding expectations. The new dining facility is a perfect example of how Stanford Dining strives to foster a culture of sustainability.

Related Topic: Food and Housing

More Information:

http://news.stanford.edu/news/2011/december/arrillaga-dining-commons-120211.html

Policy Forum Explores Best Practices in Groundwater Management

The Stanford Woods Institute for the Environment works to bring together scientists and policymakers to facilitate the sharing of knowledge for the greater good. Its Comparative Groundwater Law and Policy Workshop explored best practices for integrated groundwater management in the United States and Australia. The event brought together a small, select group of groundwater managers and experts from both nations to share experiences and practical lessons in integrated groundwater management. Through presentations and discussions, participants explored new scientific methods of mapping groundwater, discussed policy implications, and proposed topics for further exploration. The workshop was part of the broader Comparative Groundwater Law and Policy Program offered in conjunction with the Bill Lane Center for the American West at Stanford University and the United States Studies Centre at the University of Sydney. Over the next three years, the program will produce a series of reports and recommendations on laws and policies for integrated groundwater management. Through this program and others, Stanford is reaching beyond campus to effect lasting and positive change.

Related Topic: Interdisciplinary Research

More Information:

http://www.stanford.edu/group/waterinthewest/cgi-bin/web/content/comparative-groundwater-law-and-policy-workshop

"Keys to Sustainability at Stanford" Showcases Sustainability Options for Incoming Students

Hundreds of students gathered in the Jerry Yang and Akiko Yamazaki Environment and Energy Building (Y2E2) courtyard on October 17 to learn about sustainability-related majors and departments, sustainability student groups, and sustainability grants, internships, and research opportunities. The goal of this new event, designed by the Office of Sustainability and the Stanford Woods Institute for the Environment, was to "unlock the mystery" of sustainability on campus and introduce students to the multitude of ways to pursue environmental interests. The event featured speakers, raffle prizes, giveaway items, music, and eco-friendly, local food. Attendees were able to visit booths about each of Stanford's many sustainability-focused student groups, as well as booths providing information about sustainability-focused majors in the School of Earth Sciences and programming and research funding available to students through the Stanford Woods Institute for the Environment and the Office of Sustainability. The event is now an annual educational opportunity for incoming students.

Related Topic: Communications and Outreach

More Information:

http://sustainability.stanford.edu/events

Sustainable Stanford Joins Founder's Circle for Billion Dollar Green Challenge

Sustainable Stanford joined 32 other institutions to launch the Billion Dollar Green Challenge. The goal is to invest a total of one billion dollars in self-managed green revolving funds that finance energy efficiency upgrades on campus. The challenge was inspired by the exceptional 32% annual return on investment of existing green revolving funds, as documented by "Greening the Bottom Line," a report published by the Sustainable Endowments Institute. "We're transforming energy efficiency upgrades from perceived expenses to high-return investment opportunities," said Mark Orlowski, executive director of the Sustainable Endowments Institute, which is coordinating the challenge along with 13 partner organizations. "Stanford University should be commended for rising to the Challenge and investing in energy efficiency improvements on campus." The Billion Dollar Green Challenge was launched publicly this fall at the Association for the Advancement of Sustainability in Higher Education's annual conference in Pittsburgh.

Related Topic: Assessment and Evaluations

More Information:

http://www.greenbillion.org

GCEP Symposium Brings Together Academic and Industry Leaders

More than 500 scholars, businesspeople, government officials, and investors attended the seventh annual Global Climate and Energy Project (GCEP) Research Symposium in October 2011. The two-day event featured special talks by key U.S. energy thought leaders on topics such as rapid and scalable deployment of renewable energy resources, the importance of natural gas, perspectives on nuclear energy, and the impact of climate change on national security. The symposium showcased the latest technological innovations from GCEP researchers in solar energy, bioenergy, carbon-based energy systems, and advanced energy transformations and storage. In addition, students from around the world participated in a major poster session outlining the results of GCEP research collaborations. A highlight of the symposium was a series of lively tutorials conducted by four leading researchers on solar energy, the electric grid, carbon capture, and shale gas. The event led to new knowledge, new collaborations, and new optimism about transforming our energy systems.

Related Topic: Interdisciplinary Research

More Information:

http://gcep.stanford.edu/events/symposium2011/index.html

School of Medicine Hosts Second Annual Food Summit

Stanford's second annual food summit built on last year's success to produce an even more engaging event in 2011. This year's summit consisted of morning panel sessions and an evening public forum and keynote speech. Summit organizers aimed to develop further links between Stanford's resources and community food groups and provide a forum for building a learning community to improve America's food system. The morning panelists presented case studies of how Stanford is working to improve the food system within the university and in the surrounding community, including integration of local farm produce into school lunches, use of Stanford Dining as a living laboratory for improved food services, and redefinition of food at hospitals. The evening's public forum was designed to engage the local community and featured a panel of local food activists. The keynote was delivered by celebrated food advocate Frances Moore Lappe, who discussed lessons learned from 40 years of the sustainable food movement. The event succeeded in highlighting many important issues America's food system faces and outlining a more sustainable food future.

Related Topic: Interdisciplinary Research

More Information:

http://foodsummit.stanford.edu/

Stanford Featured on ESPN Eco-Challenge

As part of the ESPN Eco-Challenge, the College GameDay Goes Green Crew visited Stanford during the Stanford vs. Oregon football game and featured Stanford's sustainability efforts on ESPN.com. The crew travels with the ESPN GameDay show, explores sustainability features of the selected universities, and trades fans ESPN gear for used bottles and cans. The crew learned about Green Fund student project winners as well as Stanford's guidelines for sustainable buildings, plans for an innovative energy supply system with heat recovery, hybrid and electric vehicle fleet, waste audits, food and water systems, and energy conservation programs. The group also enjoyed a tour of Y2E2, including a display of the building's state-of-the-art energy and water dashboard. Crew members were especially impressed with Stanford's commitment to leading by example through campus operations.

Related Topic: Communications and Outreach

More Information:

http://proxy.espn.go.com/ncf/feature/video/_/id/6961544/cgd-eco-challenge

Sustainability in Space Management and Planning

Stanford continues to explore ways to increase space efficiency to reduce the need for new construction. A recent space utilization analysis for the School of Engineering resulted in the renovation of more than 250,000 square feet along Panama Mall in buildings such as Peterson Lab, Durand, and Mitchell. The study prompted plan changes that reduced the total square footage proposed for the Science and Engineering Quad by more than 20%, avoiding the need for approximately 100,000 square feet of new construction. In addition, planning under way for the Stanford Law School will transform 30,000 square feet from 41 offices and library stacks into a flexible, open office environment that will encourage collaboration among multiple disciplines. The new plan will increase work space density and provide 96 work spaces. Both plans are responses to university-wide space guidelines developed by Stanford's Land, Buildings & Real Estate (LBRE) Department. LBRE focuses on improving the efficiency and use of existing buildings to minimize the need for extensive new building. The space guidelines provide for more efficient use of office space and require schools to pay a charge for under-utilized office space. By following these space guidelines, Stanford can continue on a more sustainable path to growth.

Related Topic: New Buildings and Renovations

More Information:

http://lbre.stanford.edu/architect/space_management

Interactive Campus Water Conservation Project Map Launches

Stanford's water conservation program unveiled an interactive map that details water conservation retrofit projects from 2002 to the present. A variety of sorting parameters allow users to quickly search more than 300 indoor and outdoor projects linked to the map. Clicking on the map's icons reveals details on the water-efficient equipment installed during each retrofit project, as well as estimated water savings, where available. The map also incorporates water profiles for new buildings opened since 2007, including additional data on efficient fixtures installed. Stanford continues to be a leader in water conservation programs, having reduced its domestic water consumption 21% since 2000. The interactive map illustrates the university's extensive efforts to conserve this precious resource.

Related Topic: Water Conservation

More Information:

http://lbre-apps.stanford.edu/wc_map/index.cfm.

Fourth Year of Student Green Fund Grants

The Stanford Student Green Fund provides grants for innovative student-driven projects designed to create a more sustainable campus. A total of $30,000 per academic year is available to fund projects. This year's winners were selected for their potential to create a positive example on campus and lead to broader implementation. The Sustainability & Energy Dashboard Initiatives (SEDI) aimed to increase visibility and awareness of on-campus energy consumption. Storey House Water Metering provided information that informed and inspired water conservation among Storey House residents. Synergy Rainwater Harvesting installed a rain catchment container that will in turn feed water to house gardens and composting bins. The Farm to Fork Dinner Series hosted dinners, workshops, and speaking events to build awareness of environmental, social, and health concerns tied to the nation's current food system. The Green Roof Project continued its investigation into the feasibility of green roofs on the Stanford campus, and the Sustainability 3.0 Focus Group collected and quantified student opinions on campus sustainability issues. Members of the Green Fund Grant Committee are already planning for the 2012–13 application cycle.

Related Topic: Training and Education

More Information:

http://sustainable.stanford.edu/green_fund

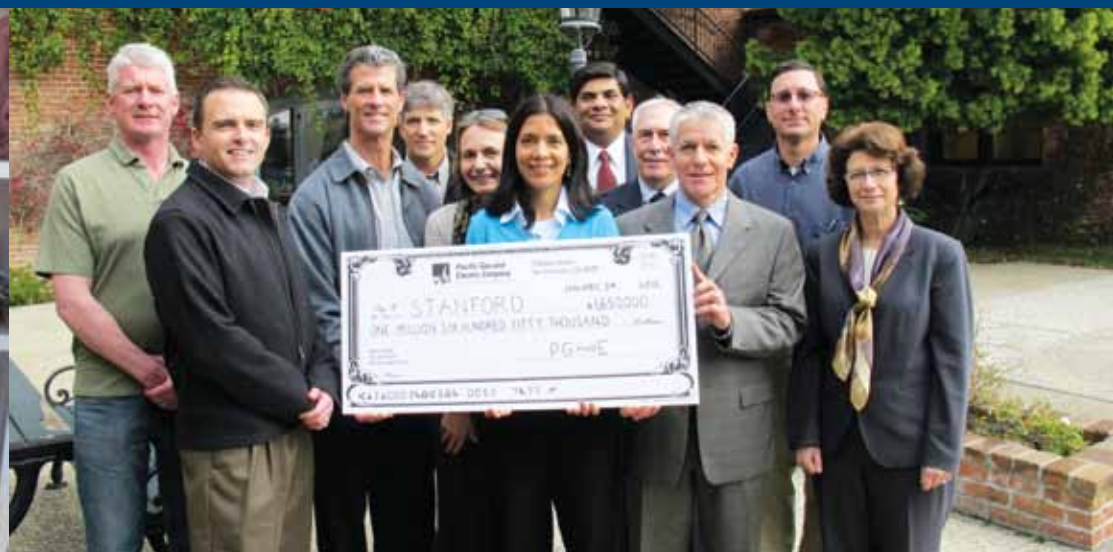
Retrofit Projects Earn a $1.64 Million Rebate from PG&E

After retrofitting four campus buildings to achieve greater energy efficiency, Stanford University has earned a $1.64 million rebate from PG&E. Upgrades to heating, cooling, ventilation, electrical, and water systems were implemented over a two-year period. These improvements are expected to save more than $1.8 million annually in energy costs. Since 1990, Stanford has earned nearly $4 million through PG&E's energy efficiency incentive programs. The retrofitted buildings are the Beckman Center for Genetic and Molecular Medicine, the Gilbert Biological Sciences Building, the Cantor Arts Center, and Green Library West (also known as the Bing Wing). The projects were funded through Stanford's Whole Building Energy Retrofit Program, which targets system-level, large-scale retrofits in the most energy-intensive buildings on campus to reduce the university's overall energy consumption. Successes like these demonstrate why demand-side energy efficiency continues to be a sustainability cornerstone in Stanford's energy solutions portfolio and a major component of the university's long-range energy and climate plan.

Related Topic: Energy Efficiency

More Information:

http://sustainable.stanford.edu/energy_initiatives



Stanford Football Embraces Sustainability

Stanford's football team had another great season, and so did stadium sustainability initiatives. At this year's games, volunteers from the Silicon Valley Bicycle Coalition oversaw valet parking for more than 5,500 bikes. The volunteers also looked after more than 230 strollers and other items, such as skateboards and scooters. This valuable service, which will return for the 2012 season, encourages the Stanford community and game day visitors to use alternative transportation.

Stanford Athletics also increased its commitment to reducing waste. In partnership with CalRecycle, the organization produced a video encouraging recycling at the Stanford Stadium. The video is now shown during all home games. The Stanford Stadium recycles cardboard, paper, plastic, metal, and glass containers. Stanford continues to develop further partnerships with the stadium to expand its zero-waste programs.

Related Topic: Waste Minimization

More Information:

http://bgm.stanford.edu/pssi_stadium_recycling

Department-Level Waste Reduction Programs Launched in LBRE

Land, Buildings & Real Estate (LBRE), the parent department of the Office of Sustainability, continues to be a role model for the university. In addition to installing Smart Strips and timers on electronics and carrying out voluntary delamping of overhead office lights, the department turned its attention to waste reduction. In a new pilot program, office composting bins were deployed in 24 kitchens across Bonair Siding. Bonair Siding is now diverting more than 750 pounds of food waste per month. This has inspired other campus departments to join the fee-for-service program.

LBRE also served as a test site for a new deskside recycling program, which provides a paper recycling bin for each desk, along with a much smaller waste bin. The small trash can indicates the quantity of trash each person should produce in a week, encourages individuals to reevaluate what they are sending to the landfill, and invites them to consider recycling or composting instead. These programs promise to reduce LBRE's waste stream, and they show how the department embodies its "Caretakers of a Legacy" motto.

Related Topic: Behavior-Based Programs

More Information:

http://recycling.stanford.edu

Leading Research: Solar-Powered Irrigation Improves African Village Life

Since 2007, Stanford researchers from the Center on Food Security and the Environment, in partnership with the Stanford Woods Institute for the Environment and the Solar Electrification Light Fund (SELF), have been examining the impact of installing solar-powered drip irrigation systems in sub-Saharan villages of West Africa. In December, researcher Jennifer Burney presented the latest project update at the American Geophysical Union meeting. The researchers have found that installing small-scale irrigation systems improves standards of living, increases nutrition, and provides greater opportunities for women. Burney suggested the systems can become "a ladder out of poverty" and will help villages adapt to climate change. Stanford researchers' next step toward improving water access in the Sudano-Sahel region is to prioritize hydrologic mapping to find sources of groundwater that communities can tap into. Researchers are also hoping to install solar-powered systems in more villages and to create a regional market and learning center for technology and farm products that can be replicated in other areas of West Africa. With research like this, Stanford is reaching beyond the Farm to positively affect global communities.

Related Topic: Interdisciplinary Research

More Information:

http://www.stanford.edu/group/solarbenin/

ERP Expands to Include Rebates for Server Virtualization

Founded in 1993, Stanford's highly successful Energy Retrofit Program (ERP) continues to save vast amounts of electricity through projects that improve building efficiency. ERP has expanded its offerings to include rebates for server virtualization. Stanford recently initiated a three-year enterprise license agreement with VMware, which offers server virtualization services. Virtualizing data servers lets Stanford save electricity by avoiding running both the servers and the extensive climate control they require. In addition to making virtualization software available to campus, ERP has been customized to make it easier for groups on campus to apply for funds to remove hardware and virtualize environments. The rebate program provides approximately $650 for each server removed over a two-year period. Within six months of its creation, the program had distributed over $4 million in software. The online ERP application and more information can be found on the new VMware @ Stanford website. Stanford's program is the result of collaboration among six campus organizations: the School of Medicine, IT Services, Administrative Systems, Land, Buildings & Real Estate, Stanford University Libraries and Academic Information Services (SULAIR), and HighWire.

Related Topic: Energy Efficiency

More Information:

http://sustainable.stanford.edu/vmware

http://sustainableit.stanford.edu

Leading Research: Engineers Investigate Carbon Storage Options

By exposing rocks to high temperatures and pressures, earth scientists led by Sally Benson obtained critical new data about permanent underground storage of greenhouse gases (GHGs). The Stanford researchers injected CO_2 and water into stressed rock samples and analyzed the results in microscopic detail. The goal is to predict how minute grains and pores in various kinds of rock will affect the flow of vast quantities of CO_2 pumped thousands of feet below the surface. "We want to see where the CO_2 moves, how fast, how much gets dissolved, and how much gets trapped," said Benson, director of Stanford's Global Climate and Energy Project. Using X-ray CT scans, researchers developed a new imaging technique that generates detailed three-dimensional maps showing the real-time movement of CO_2 between individual grains of rock. Previously, scientists could only estimate the average properties of a rock. The new technique can be used to analyze precisely a potential site for sequestration. And, in a breakthrough finding, the team demonstrated that eventual leakage of CO_2 from storage is not nearly as big of a risk as some experts feared.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2011/december/benson-climate-change-120611.html

Stanford Board of Trustees Approves Innovative Campus Energy Program

At its winter meeting, Stanford's Board of Trustees gave concept approval to the Stanford Energy System Innovations (SESI) program, which is designed to meet the university's energy demand through 2050. The Department of Project Management (DPM) is leading the $438 million project for hot-water pipe installation and the construction of the Replacement Central Energy Facility with heat recovery technology. More than 20 miles of hot-water pipes will be installed, and changes will be made to the mechanical rooms of 155 buildings. Since the board gave its approval, DPM has engaged in a comprehensive outreach effort, discussing the work ahead with schools and departments and soliciting scheduling feedback so that implementation can be carefully sequenced to minimize disruption to campus life. SESI program implementation began in June 2012. When completed, it will reduce campus GHG emissions by 50% and use of potable water by 18%, open up the energy supply platform to future technologies, enable the campus to better manage its power portfolio, and produce significant utilities savings through 2050.

Related Topic: Climate and Energy

More Information:

http://sesi.stanford.edu

Stanford ENERGY SYSTEM INNOVATIONS

Winter Closure Campaign Tops Prior Performance

The 2011–12 winter curtailment and "Turn Off for Break" campaign came to a close with great results, far exceeding the goal of a 10% increase in savings over the prior year. The campaign avoided $266,000 in utility costs, a 32% increase from 2010 (all other factors being about the same). In all, 168 buildings participated fully or partially in the curtailment. They saved 1.6 million kWh of electricity (a 12% increase per day from 2010), 5.7 million pounds of steam (a 41% increase per day from 2010), and 1,033 metric tons of CO_2 emissions (a 25% increase from 2010). The Office of Sustainability infused the existing program with more incentives by offering $2,500 in participation prizes for buildings and individuals making exceptional efforts for winter closure. The Juniper Building, home to Computer and Information Systems for Human Resources, won the General Participation prize. The Braun Music Center won the Performance Improvement prize. Scott Hofflander, trades and crafts supervisor in the HVAC shop, was awarded the Outstanding Individual Contributor prize—he was nominated by his peers from Zones and Building Managers. The Office of Sustainability will build upon the success of this year's campaign to achieve even greater savings in the future.

Related Topic: Behavior-Based Programs

More Information:

http://sustainable.stanford.edu/be_cardinal_green_winter_closure

Commute Club Celebrates Tenth Anniversary

Stanford Commute Club, a program that rewards commuters who do not drive alone, has come a long way in the past ten years. In 2002, the Commute Club had 3,600 members. Today, it has 8,000. In 2002, the drive-alone rate for university employees was 72%. By 2012, just 47% of university employees were driving alone, with more than half using alternative transportation for their primary commute. Over the years, the Commute Club has expanded to include clean air cash and carpool credits, up to 12 free hourly car rental vouchers per year, up to $96 per year in free Zipcar driving credits, a $50 Refer-a-Friend and $100 permit-return program, part-time pledge incentives, free daily parking scratchers and reserved parking for carpools, a $200 per month subsidy for each Stanford vanpool, free vanpool parking, one-week free folding bike rental, and a $100 subsidy toward the purchase of selected folding bikes. Stanford also offers pre-tax payroll deductions for transit purchases, free transit passes for eligible employees, an emergency ride home program, free commute planning, free ride matching, and the free Marguerite shuttle system.

Related Topic: Transportation

More Information:

http://commuteclub.stanford.edu

Student Housing Launches New Sustainable Living Program

Student Housing, a division of Residential and Dining Enterprises, invested in a full-time staff member dedicated to managing its new Sustainability and Conservation Program Office. The goal of the office is to reduce Student Housing's environmental footprint and provide a foundation for generations of students to live sustainably in campus residences and in their own homes after they graduate. The long-term plan includes large initiatives such as a new high-performance residence, an overhaul of utilities management, and more infrastructure that supports sustainable behaviors across residences, such as recycling and composting. The plan also includes smaller-scale initiatives, including sustainable living workshops, a more interactive website, student internship programs, and an enhanced "green move-out" program at the end of the academic year.

Related Topic: Food and Housing

More Information:

http://www.stanford.edu/dept/rde/cgi-bin/drupal/housing/living/living-green-and-sustainability

Student Workshop Series Promotes Sustainability in Everyday Life

What do bees have in common with bicycles? Both were subjects of SustainaSkills workshops organized by Students for a Sustainable Stanford's (SSS's) outreach team. These workshops convey practical sustainability knowledge and skills to the larger student population, often through collaboration with SSS partners. In the 2011–12 academic year, participants learned how to conduct their own building audit to help them live more sustainably, properly maintain and repair bicycles, and make fresh, Ratatouille-worthy bread. Through these workshops, SSS has raised the profile of sustainability and illustrated the links between sustainability and a wide range of other activities and campus organizations. The group looks forward to organizing more memorable and exciting SustainaSkills workshops next year.

Related Topic: Student Leadership and Activities

More Information:

http://sustainability.stanford.edu

Engineers for a Sustainable World Wins First Place in Social Entrepreneurship Challenge

Engineers for a Sustainable World's Dhaka Water Initiative team at Stanford University spent the year developing an in-line chlorinator for low-income urban neighborhoods that rely on shared drinking water points. The team, which is advised by Professor Jenna Davis and Dr. Steve Luby, won first place and a $20,000 prize at the Social Entrepreneurship Challenge sponsored by the Business Association of Stanford Entrepreneurial Students. The team also won a P3 (People, Prosperity, and the Planet) award from The U.S. Environmental Protection Agency (EPA) to further its work. This summer, the team is field testing its prototype in the slums of Dhaka, Bangladesh, in collaboration with the International Centre for Diarrheal Disease Research, Bangladesh. This new technology has the potential to benefit not only the 10 million slum dwellers of Dhaka, but the half a billion urban residents worldwide whose piped networks deliver water rendered unsafe by biological contamination.

Related Topic: Student Leadership and Activities

More Information:

http://stanforddhakawater.wordpress.com/

Record Participation During Second Annual Bike Safety Dorm Challenge

Students in 42 undergraduate residences participated in the second annual Bike Safety Dorm Challenge, sponsored by Parking & Transportation Services (P&TS) throughout the fall quarter. The challenge promoted bike safety by encouraging undergraduates to pledge to follow the rules of the road and to wear a bike helmet for every ride, even short trips. Three dorms—Jerry, Muwekma-Tah-Ruk, and ZAP—posted 100% participation and were tied for first place. Muwekma-Tah-Ruk, the Native American theme dorm, won a drawing that broke the tie and took away the grand prize: a free charter bus to Lake Tahoe. Jerry and ZAP did not leave empty-handed: each received a $500 credit toward a future charter bus to Tahoe. P&TS is excited about the building momentum for bike safety among Stanford undergraduates. Participation by 926 students and 42 of Stanford's 78 undergraduate dorms this year represents a significant increase from the 666 students and 40 dorms that participated in 2010, when the challenge first launched. "Everyone who participated is a winner in our eyes," P&TS director Brodie Hamilton said. "Bike safety is a way to save lives and lobes—and what brighter 'lobes' to save than those at Stanford?"

Related Topic: Transportation

More Information:

http://bike.stanford.edu

Fifth Annual Campus Greenhouse Gas Emissions Inventory Verified

For the fifth consecutive year, Stanford received third-party verification of its greenhouse gas (GHG) emissions inventory. Stanford's 2010 emissions were verified through the Climate Registry. The university's carbon dioxide–equivalent GHG emissions for Scope I and Scope II from the main campus totaled approximately 195,800 metric tons. The campus also prepared unofficial inventories of its Scope III emissions and those attributed to steam and chilled-water deliveries to Stanford Hospital and Clinics. In 2010 emissions increased, a reflection of campus growth and increased research building intensity. Electricity consumption data included for the first time from Falk and the GALE buildings (Grant, Always, Lane, and Edwards) also contributed to the increase in the university's emissions. Stanford has completed an emissions inventory each year since 2006, and it continues to be a valuable tool for Stanford's climate action planning.

Related Topic: Climate and Energy

More Information:

http://sustainable.stanford.edu/emissions_inventory

Farm to Fork Program Connects Students with Sustainable Food

With support from the Stanford Student Green Fund and Stanford Dining's Sustainable Food Program, the Stanford Farm Project kicked off "Farm to Fork". This series of 14 dinners, workshops, and events attracted an overwhelming amount of student interest, giving organizers a chance to expose a diverse group of undergraduate and graduate students to the sustainable food movement. The series centered on education and outreach to help students become more aware of the environmental, social, and health concerns tied to the nation's food system. Cooking workshops—such as those with San Francisco chef Salomon Bornstein and Hodo Soy Beanery founder Minh Tsai—met a long-standing campus demand. The Farm to Fork series facilitated discussions of water, resource use, soil, chemical runoff, food justice, and hunger. Following the success of its inaugural year, students are lining up events for next year's Farm to Fork series.

Related Topic: Food and Housing

More Information:

http://stanfordfarmproject.wordpress.com/

Leading Research: Wireless Charging on the Highway

A new technology could untether electric vehicles. Led by Shanhui Fan, Stanford electrical engineers are designing a system that transmits power from just below the road to cars passing above it. Their long-term goal is to develop an all-electric highway that wirelessly charges cars and trucks as they cruise along. A series of coils connected to an electric current would be embedded in the highway, and receiving coils attached to the bottom of each automobile would resonate as the vehicle sped along, creating magnetic fields that continuously transferred electricity to charge the battery. This innovation could overcome one of the biggest barriers to the transition to electric vehicles: their range is limited, and they need to be plugged in and recharged for hours. "You could potentially drive for an unlimited amount of time without having to recharge," said Richard Sassoon, who coauthored a paper on the research that appeared in Applied Physics Letters in April. "You could actually have more energy stored in your battery at the end of your trip than when you started."

More Information:

Related Topic: Interdisciplinary Research

http://news.stanford.edu/news/2012/february/wireless-vehicle-charge-020112.html

Public Utilities Commission Decision on PG&E Fees Gives Major Boost to SESI

The Stanford Energy System Improvements (SESI) program received a $40 million boost in February when the Public Utilities Commission (PUC) agreed that Stanford does not have to pay "exit fees" to move from PG&E power to direct access (DA). Gaining access to competitive electricity markets and removing the burden of exit fees will ensure Stanford can achieve affordable clean energy for decades to come. Exit fees are imposed on customers exiting the PG&E system as a 30-year recovery of PG&E costs from the 2001 energy crisis. The university believed it was not liable for the fees because it used on-site cogeneration, and in February PUC Decision 12-02-024 directed PG&E to eliminate exit fees from Stanford's future DA electricity purchases and refund any fees collected from the university since its switch to DA in April 2011. In July the university received a $228,000 refund of fees for small first-year DA purchases. It expects to save $40 million over the next few decades, after cogeneration is retired and all campus electricity is purchased from the grid.

More Information:

Related Topic: Climate and Energy

http://sesi.stanford.edu

GSB Hosts International Sustainable Development Summit

The Graduate School of Business' Center for Social Innovation and the U.S. Department of State hosted a variety of local, national, and international leaders at a novel event called USRio+2.0: Bridging Connection Technologies and Sustainable Development. The event was a precursor to June's United Nations Rio+20 meeting, which addressed sustainable development. At USRio+2.0, policymakers, practitioners, and innovators discussed using simple and widely available connection technologies (such as SMS, mobile, Web, and social media) to advance sustainable development solutions in health care, the environment, agriculture, and sustainable economic growth. The event was interactive, with talks and panels but also opportunities for audience participation through breakout sessions, and a final "unconference" session designed to lead to dynamic new ideas. Many Silicon Valley entrepreneurs met to discuss innovative new technologies that have great potential to save lives and improve living standards. EPA administrator Lisa Jackson spoke about both the challenges and the opportunities of the widespread availability of technology. The event's success led to improved outcomes at June's UNRio+20 meeting.

Related Topic: Interdisciplinary Research

More Information:

http://csi.gsb.stanford.edu/rio20-conference

DOE Selects Stanford's Solar Decathlon Team for National Competition

The Department of Energy (DOE) recently selected a team of Stanford students to compete in the prestigious national Solar Decathlon competition in late 2013. Teams from 20 universities will receive seed money to design, build, and operate a solar-powered, net-zero home. The teams will have two years to complete the project, which will include fundraising, identifying corporate partnerships, and marketing. During the week-long competition, which attracts hundreds of thousands of spectators, the homes will be judged on their market appeal, realistic feasibility, presentation, and performance. Six team members will live in the home for 10 days, performing everyday living activities using 100% solar energy produced on-site. The Solar Decathlon team is the first group from Stanford to participate in this competition, which garners international applications and media attention. The team hopes that its success in 2013 will lead to Stanford becoming a perennial participant in the biannual competition.

Related Topic: Student Leadership and Activities

More Information:

http://solardecathlon.stanford.edu

Scientists and Policy Makers Solve Environmental Problems at Uncommon Dialogues

The Stanford Woods Institute for the Environment continued to host its Uncommon Dialogues series, designed to bring scientists and policymakers together in a neutral setting to share ideas and knowledge. The dialogues develop solutions to environmental problems while providing a two-way flow of information that informs Stanford's research. In February, the Stanford Woods Institute hosted two Uncommon Dialogues: "Applied Conservation Science" and "Commercial Outfitting and the Wilderness Act." The first promoted collaboration between land managers and academic researchers interested in ecosystem management in the complex landscapes of the San Francisco Bay Area, and the second brought together a mix of stakeholders to discuss the legal, scientific, and policy challenges of commercial outfitting in wilderness areas. In April, the group hosted an Uncommon Dialogue focused on forging partnerships between groundwater managers and scientists to develop practical solutions using the latest in groundwater technology. These dialogues extend Stanford's influence beyond campus, enabling the university to be a global leader in developing sustainable solutions.

Related Topic: Interdisciplinary Research

More Information:

http://woods.stanford.edu/ideas/applied-conservation-science.html

Stanford Again Designated as Best Workplace for Commuters

For the tenth year in a row, the National Center for Transit Research designated Stanford University as one of the Best Workplaces for Commuters. It also honored Stanford with the "Best Of" award, the top prize in the 2011 Race to Excellence, and a Gold award in the university category. The Race to Excellence award recognized the following aspects of Stanford's efforts to encourage alternative transportation:

- Seasonal incentives and promotions;
- An 879-person increase in users of Zipcar car sharing from 3,372 in January 2011 to 4,251 in October 2011;
- A 510-person increase in users of Zimride ride matching, from 3,737 in January 2011 to 4,247 in October 2011;
- A new wide-scale transit pass distribution reaching 1,664 employees at six convenient locations around campus;
- Major Marguerite shuttle route changes that reduced emissions by eliminating 100,000 miles traveled annually;
- Installation of new electric vehicle charging stations and new bicycle safety repair stands.

Related Topic: Transportation

More Information:

http://www.bestworkplaces.org

RecycleMania Campaign Generates Record Number of Pledges

RecycleMania, a national competition and benchmarking tool for higher education recycling programs, kicked off in early February. This was Stanford's sixth year in the competition. Over the eight-week campaign, Stanford collected more than 1,100 pledges. For each week, students, faculty, and staff were asked to visit the RecycleMania webpage and pledge to keep recyclables out of the landfill/trash bins. This year, the Office of Sustainability enhanced the campaign by offering $1,500 in participation prizes. At the conclusion of the campaign Stanford scored "personal bests" in three categories: waste minimization, bottles and cans, and food waste. More than 200 colleges and universities across the United States compete in RecycleMania. Stanford led the PAC-12 schools in all categories except waste minimization (landfilled waste per person). Stanford now has six years of data that can help improve its zero-waste program.

Related Topic: Behavior-Based Programs

More Information:

http://sustainable.stanford.edu/recyclemania

Students Compete for Savings in "Water Wars"

More than 450 Florence Moore residents participated in the 2012 Stanford Water Wars, an inter-dorm competition to see which residence hall could conserve the most water over the course of a month. Stanford's Green Living Council (GLC) teamed up with Student Housing to host the competition. Aquacue Barnacle water meters provided live streams of water consumption data that were compared to baseline numbers recorded before the competition and posted on a website for competitors to see. GLC focused on teaching participants how to save water and the significance of water conservation on campus and in the region. Flyers were posted in residences and timers were installed in every shower. GLC provided consultation resources, went door to door with competition reminders, hosted film screenings, and invited Stanford faculty to speak to residents about water resources and the importance of conservation. During the competition, the residences saved 7,300 gallons, reducing water use 2% from the lowest baseline. Most importantly, Water Wars helped competitors discover small ways to conserve one of our most fundamental resources.

Related Topic: Student Leadership and Activities

More Information:

http://glc.stanford.edu/node/541

http://aquacue.com/

Sustainability Practices Survey Reveals Savings Potential of Individual Actions

The Office of Sustainability surveyed a very small and randomly selected sample of Stanford students, faculty, and staff about their sustainability habits. The survey sought to identify baseline levels of environmental sustainability awareness and everyday practice on campus. Survey participants were asked about habits and barriers related to office and room lighting, computers, monitors, printer use, personal air conditioners and heaters, refrigerators, reusable products, water, recycling and composting, food choices, and the influence of others. The Haas Center for Public Service, the Stanford Woods Institute for the Environment, the Precourt Institute for Energy, Stanford's Health Improvement Program, Stanford Dining, Students for a Sustainable Stanford, Green Living Council, and the Associated Students of Stanford University contributed to the design of the survey. The survey results highlighted areas of success (90% of respondents turn off the lights when they leave an area) as well as opportunities for improvement (only 56% compost regularly). The Office of Sustainability is using survey data to inform future campaigns and program design.

Related Topic: Behavior-Based Programs

More Information:

http://news.stanford.edu/thedish/?p=17607

Human Resources Completes a Lean, Green Move

University Human Resources (UHR) has embraced sustainability, implementing its first-ever "green move." When more than 95 staff members relocated from campus modular offices to new offices at Porter Drive, UHR partnered with groups such as the Office of Sustainability and Peninsula Sanitary Service, Inc. (PSSI) to provide presentations at a series of planning meetings on best practices when moving and setting up new office spaces. The presentations included information and resources on recycling, surplus equipment disposal, purchasing, and installation of energy-efficient equipment like Smart Strips and equipment/appliance timers. During the move, UHR recycled 3,264 gallons (15 cubic yards) of paper. In setting up the new work spaces at Porter Drive, staff consolidated printers, installed Smart Strips on all workstations, and aimed to have four zero-waste kitchens, redeploying all kitchen utensils from the modular offices. UHR's continued support of sustainability in the workplace has helped to cultivate the culture of sustainability on Stanford's campus.

Related Topic: Behavior-Based Programs

More Information:

http://sustainable.stanford.edu

University Planning Conference Promotes Sustainability

Stanford hosted the Society for College and University Planning's (SCUP's) 2012 Pacific Regional Conference, "Leadership for the 21st-Century Campus," at the Li Ka Shing Center. It was the largest regional SCUP conference ever, with close to 500 participants. The program featured sessions on transportation, energy, housing, building systems, and landscape, as well as an array of campus tours. An opening plenary talk by Martha J. Kanter, undersecretary of education, was followed by speakers from around the world sharing their thoughts on leadership. For the first time, the Pacific Regional Conference connected via live feed to the Higher Education Planning in Asia Forum, allowing speakers to share their perspectives on leadership across continents. Participants included many campuses of the western United States; Peking University School of Transnational Law and NYU Shanghai; the Campus for Research Excellence and Technological Enterprise in Singapore; the Singapore University of Technology and Design's partnership with MIT; the Okinawa Institute of Science and Technology; and the Hong Kong University of Science and Technology partnership with Northwestern University's Kellogg School of Management.

Related Topic: Collaborative Governance

More Information:

http://lbre.stanford.edu/architect/

Green Screens Showcases Environmental Documentary Created by Stanford Graduates

Green Living Council's Green Screens Film Series, hosted throughout the year during late night dining at Lagunita and Arrillaga Family Dining Commons, was a great success. On March 16, a particularly memorable Green Screens featured an award-winning docu-comedy called *YERT: Your Environmental Road Trip*. The story of three friends traveling across all 50 states in the course of one wild year was followed by a session with the filmmakers. Mark Dixon and Ben Evans, both Stanford and Fleet Street alumni, enthusiastically answered questions from the audience and displayed by-products of their road trip. The cross-country adventure was an exploration of approaches to environmental sustainability with the goal of creating less than one shoebox of garbage each month. This special Green Screens evening captured the attention of Stanford alumni and students—it was fun, enjoyable, and inspirational. Seeing the paths that alumni have taken to promote sustainability spurs Stanford community members to make sustainable choices of their own.

Related Topic: Student Leadership and Activities

More Information:

http://glc.stanford.edu/node/545

http://www.yert.com

Knight Management Center Earns LEED-NC Platinum Rating

The Knight Management Center, an eight-building complex at the Graduate School of Business, has earned a LEED-New Construction Platinum® rating from the U.S. Green Building Council—the organization's highest certification level. The buildings received 60 points, far above the 52-point threshold for the Platinum rating. The buildings contain a variety of energy efficiency features, including:

- Rooftop photovoltaic (PV) panels that generate 12.5% of Knight Management Center's electricity needs;
- Extensive use of natural daylight and automatic light sensors to reduce artificial lighting when not necessary;
- Rainwater capture, storage, and reuse for on-site irrigation;
- Chilled beams and night flushing that provide efficient cooling;
- Recycled content in 25% of building materials and diversion from landfill of more than 98% of waste from building construction.

The Stanford Graduate School of Business's Knight Management Center underscores Stanford's commitment to high-performance design and construction practices.

Related Topic: New Buildings and Renovations

More Information:

http://gsb.stanford.edu/about/knightcenter/leed/leed-platinum.html

Stanford Energy Club Becomes Hub for Energy Community

The Stanford Energy Club (SEC) is one of Stanford's newest environmental student groups, a fact belied by its extensive offerings. The club serves as the go-to resource for all things related to energy. Listings of environmental student groups; energy-related courses, majors, and campus organizations; local energy events; and energy jobs are just some of the resources SEC offers the Stanford community. The club has also launched the Stanford Energy Journal, published online biannually and featuring in-depth articles, with each issue focused on a single theme. Authors are drawn from a combination of students representing the depth and breadth of disciplines at Stanford and the world's foremost thought leaders in science and technology, business, law, and policy. In addition, the SEC partners with Berkeley students to hold the annual Berkeley-Stanford Cleantech Conference. This year's conference, hosted at Stanford, addressed cleantech in emerging markets and featured renowned venture capitalist Vinod Khosla as the keynote speaker.

Related Topic: Student Leadership and Activities

More Information:

http://energyclub.stanford.edu/

New Course Empowers Students to Make Sustainable Food Choices

Undergraduates Jenny Rempel ('12) and Amanda Martinez ('14) collaborated with Patrick Archie, farm educator in the School of Earth Sciences, and Matt Rothe, manager of Stanford Dining's Sustainable Food Program, to offer a student-initiated course (EARTHSYS 11si) in spring quarter titled "Grow It, Cook It, Eat It: Personal Empowerment in Interdisciplinary Food Systems." Students were introduced to many facets of the food system, from "the very local to the extremely global," and were provided a framework for analyzing the food system through the lenses of educators, practitioners, and professionals. The course comprised lectures that covered everything from the Farm Bill to food justice, as well as a series of practicums on how to grow and cook food. Culinary classes were led by Stanford Dining director of operations Gary Arthur, who taught the students everything from basic knife skills to how to cook a vegan dish in any cuisine. This marks the beginning of a series of courses sponsored by Stanford Dining's Sustainable Food Program in which students will explore food systems study and discourse in unique hands-on environments.

Related Topic: Food and Housing

More Information:

http://sustainable.stanford.edu/food

GCEP Awards $8.4 million to Climate Research

Stanford's Global Climate and Energy Project (GCEP), an independent research institute reporting to the dean of research, has awarded $8.4 million to seven Stanford research teams for the development of new technologies that could significantly lower greenhouse gas emissions. As stated in the Stanford Report, this brings the total number of GCEP-supported research programs to 93, with total funding of approximately $113 million since the project's launch in 2002. These awards support fundamental research on a broad range of potentially game-changing energy technologies—from an all-carbon solar cell to a soot-free diesel combustion process. This year's projects address topics such as improved solar energy conversion, sootless diesel, hydrogen production from glucose, high-power batteries for the electric grid, methane from microbes, new materials for energy conversion applications, and carbon solar cells. These projects exemplify the cutting-edge research occurring at Stanford that will revolutionize the world's energy future.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/march/gcep-energy-grants-032912.html

Innovative Transportation Program Rewards Commuters for Driving Outside Peak Hours

Strategies to mitigate traffic congestion could reduce CO_2 emissions by 7 to 30%, according to the UC Transportation Center, but policymakers have traditionally paid relatively little attention to this issue. An innovative Stanford-led traffic research project may change this. Stanford launched a pilot program offering incentives to commuters to reduce rush-hour traffic around campus. The Congestion and Parking Relief Incentives (Capri) program uses radio-frequency identification readers to track the exact time that participating commuters enter and exit the campus and rewards those who drive during off-peak periods. The opt-in program aims to reduce both traffic and emissions, and also to help Stanford meet the goals of its General Use Permit. Participants who commute during off-peak hours receive credits in a game offering multiple opportunities to win prizes of varying dollar values. Balaji Prabhakar, Stanford professor of electrical engineering and computer science, leads the project. His research team is collaborating with Stanford Parking & Transportation Services and has secured a grant from the U.S. Department of Transportation.

Related Topic: Transportation

More Information:

http://capri.stanford.edu

Pilot Elevator Retrofit Lights the Way for Campus

Campus operations staff continue to explore ways to increase Stanford's energy efficiency, even in unlikely places. Buildings & Grounds Maintenance (BGM) recently implemented an efficiency project in Keck Science Building's elevator cabs that produced significant savings in both maintenance and electricity costs. Keck's elevator contained 40 halogen bulbs, which often burned out and drew a formidable 1,000 watts at any given time. Due to their location, the elevator lights are required to run continuously. BGM found LED lights that could serve the same function as the existing bulbs. The lighting now requires just eight fixtures, and the LEDs use only 3.3 watts each—considerably less than the original 25-watt bulbs. The longer service life of the LED bulbs—25 times greater than the original lighting—leads to a payback period of only 2.5 years, including the reduction in bulb maintenance costs. The success of this retrofit project has led to plans to roll out similar lighting upgrades in elevators across campus.

Related Topic: Energy Efficiency

More Information:

http://lbre.stanford.edu/sem/energy_retrofit_program

Before

After

DC Bootcamp Trains Graduate Students to Influence Environmental Policy

Each year, the Stanford Woods Institute for the Environment sends a select group of graduate students to the nation's capital for hands-on training in turning environmental research into policy. Hosted through the Rising Environmental Leaders Program at the Woods Institute, the "bootcamp" helps students hone their leadership and communications skills to maximize the impact of their research. As stated in the *Stanford Report*, 24 PhD students and postdoctoral scholars from a range of disciplines traded sandals for suits and books for bills. They listened to speakers from various agencies and organizations, sat in on hearings, and navigated the city to meet with movers and shakers in their research fields. The students came away having garnered firsthand knowledge of national policy development, partnership building, public service, and how to use their leadership and communication skills to widen the impact of their research. In 2013, the Stanford Woods Institute plans to open a Washington, DC office to help scientists translate their research into policy.

Related Topic: Training and Education

More Information:

http://news.stanford.edu/news/2012/april/dc-boot-camp-040612.html

Two Local Sustainability Programs Receive Community Partnership Awards

Stanford's annual Community Partnership Awards honor local organizations that tackle real-world problems and advance the public good in neighboring communities. As described in the Stanford Report, this year's winners included two environmentally minded groups: Canopy, which is devoted to planting and preserving trees; and the Stanford Project on Hunger, a student group that collects, saves, and prepares unused leftover food on campus for distribution to the hungry. Canopy is dedicated to protecting and expanding the urban forest in Palo Alto. Its Healthy Trees, Healthy Kids! Program, a multiyear initiative to plant 1,000 shade trees and fruit trees, engages children and volunteers in educational activities, including the planting of hundreds of trees on school grounds. The Stanford Project on Hunger collects food that would otherwise be wasted from campus dining halls, row houses, eating clubs, and special events. The food is delivered to the Opportunity Center in Palo Alto, which turns it into meals throughout the week. Both projects result in better collaboration and understanding between Stanford and communities on the mid-Peninsula and will have positive environmental impacts for years to come.

Related Topic: Student Leadership and Activities

More Information:

http://news.stanford.edu/news/2012/april/community-partnership-awards-041712.html

Haas Center for Public Service Develops Transportation Challenge for Employees

Stanford's Haas Center for Public Service is leading the way in implementing green behavior change. The Sustainable Haas committee, a group of Haas staff members committed to sustainable behavior, designed and implemented its own sustainable transportation challenge. During spring quarter, participating Haas Center staff were encouraged to use alternative transportation and track their progress. Those who did not have the option of public transportation could submit an "alternative carbon reduction plan"—for example, committing to reduce meat consumption or avoid seafood listed as "red" on the Seafood Watch list. Nearly 60% of Haas employees participated in the challenge, leading to many sustainability-related watercooler discussions. Alternative carbon reduction plans included eliminating disposable serviceware; eating seasonal, local, and organic food; increasing bulk purchases to reduce packaging; and using reusable shopping bags. Through this project, Haas employees exemplified Stanford's tradition of leading by example. The Office of Sustainability uses Haas's positive example to encourage other departments to make sustainable choices everyday occurrences.

Related Topic: Behavior-Based Programs

More Information:

http://sustainable.stanford.edu/building_level_sustainability

Leading Research: Biofuels Play a Critical Role in Food Security

In the first decade of the 21st century, global production of ethanol and biodiesel increased nearly tenfold. If that trend continues, according to Rosamond Naylor, director of the Center on Food Security and the Environment, national biofuel policies will have increasingly powerful impacts on food prices, food security, energy security, and rural incomes in the developing world. During an April symposium, Naylor addressed the role of biofuels in global food price volatility and the implications of biofuel development in rural Africa and Asia. Although she acknowledged that global income and population growth have contributed to increased demand for biofuels, Naylor also emphasized "the unbelievable dominance of policy" in driving current trends. For example, policies that fix demand for corn from the ethanol market have a destabilizing effect on corn prices, especially in the face of supply shortages.

Related Topic: Interdisciplinary Research

More Information:

http://foodsecurity.stanford.edu/news/biofuels_have_mixed_impacts_on_food_security_20120419/

Leading Research: Stanford Researchers Work with Hawaii's Largest Landholder to Plan an Ecological Future

Researchers from Stanford's Natural Capital Project partnered with the Kamehameha Schools Trust to determine the best use for a 40-square mile tract of land on Oahu, Hawaii. As summarized in the Stanford Report, the abandoned farmland needed to be repurposed after a century of sugar cultivation. Stanford researchers worked closely with the trust for two years to determine the fate of the farm, with the goal of providing ecological models for decision makers. Kamehameha Schools ultimately decided to reinvest in irrigation and use the land for diversified agriculture, including cacao, bananas, and papaya. This partnership was a critical test of the Natural Capital Project, which aims to facilitate better land- and water-use decisions with resources like its free InVEST software, which helps resource managers quantify the full range of benefits and services provided by oceans and natural landscapes.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/april/hawaii-land-management-042412.html

http://www.naturalcapitalproject.org/

Stanford Hosts Art & Science of Sustainability Colloquium

Stanford Residential Education and the Program in Writing and Rhetoric hosted their first Art & Science of Sustainability Colloquium. This event brought together artists, writers, and scientists whose work involves sustainability. Featured participants included Wes Jackson, author and president of the Land Institute; Scott Sanders, author of more than 20 fiction and nonfiction books; Krista Detor, singer and songwriter; and Mark Feldman, director of Stanford University Sustainability Scholars. One of the colloquium's central goals was to engage students to the greatest extent possible. Toward that end, the events steered away from the conventional presentation format and instead provided opportunities for student participation. The first day featured a roundtable discussion in which participants shared some thoughts about how they think about sustainability and how they became interested in these issues. On the second day, small workshops enabled students to work directly with featured participants. The weekend events concluded with a concert by Krista Detor. The colloquium helped students explore their sustainability interests and find ways to turn their sustainability visions into reality.

Related Topic: Interdisciplinary Research

More Information:

http://www.stanford.edu/group/suss/cgi-bin/main/?page_id=179

Sustainable Stanford Offers Inaugural Earth Day Campaign

As part of the Cardinal Green campaign series, Sustainable Stanford launched "Make Every Day Earth Day," a campaign to encourage the campus community to incorporate into everyday life simple sustainable actions that can have a huge impact when compounded. Several small actions, such as turning off the lights, were carefully chosen based upon the results of February's Sustainable Practices Survey; they are detailed the new "Tree's Pocket Guide to a Sustainable Stanford."
The Earth Day campaign received a lot attention via social media channels and was featured and promoted on both Facebook and Twitter. The Office of Sustainability plans to make the campaign into an annual pledge drive to gauge and track campus engagement over time.

Related Topic: Behavior-Based Programs

More Information:
http://sustainable.stanford.edu/earthday

Green Living Council Hosts Earth Day Festivities

What better day to celebrate sustainability at Stanford than Earth Day? To remind the Stanford community about this important day, the Green Living Council (GLC) held an Earth Day Celebration Fair, with activity tables hosted by the group and its partners that highlighted fun strategies for sustainable living. GLC brought back the popular smoothie bike and offered a notebook-making activity, helping people make their own notebooks from cereal boxes and scrap paper. Two other booths hosted by GLC urged students to show their support for sustainability at Stanford by committing to one green living practice as part of the Do One Thing (DOT) project or signing a "Stanford for a Greener Future" banner. Engineers for a Sustainable World brought out its solar oven to demonstrate the power of solar energy, serving sunbaked s'mores and cookies. Across White Plaza, Students for a Sustainable Stanford held a waste audit in collaboration with the Stanford Recycling Center. By the end of the fair, more than a hundred students had a better understanding of how incorporating green living into daily life can be fun and enjoyable. The event was praised by many participants and will surely return next year!

Related Topic: Student Leadership and Activities

More Information:
http://glc.stanford.edu/earthday

New Student Podcast Explores 21st-Century Environmental Issues

In a new podcast series, Stanford faculty and staff explore what it means to live in the Anthropocene era, defined as the period in which humans have had the most dramatic impact on the planet, and its implications for 21st-century environmental issues. As summarized in the Stanford Report, doctoral students Mike Osborne and Miles Traer wanted to delve deeper into the topic to educate themselves, other students, and a wider audience. Together with Thomas Hayden, lecturer in the Emmett Interdisciplinary Program in Environment and Resources, they offered a winter-quarter class through Earth Systems entitled "Podcasting the Anthropocene." Students set up interviews with a broad range of experts, from anthropologists to agricultural ecologists, and recorded the conversations at Stanford's radio station, KZSU. In the weeks since the Generation Anthropocene website went live, it has received thousands of hits and coverage from media outlets such as *Scientific American* and the environmental website Grist. With generous support from the School of Earth Sciences, Osborne, Traer, and Hayden plan to continue the project this summer, beginning with interviews of fellows in the Leopold Leadership Program, an academic leadership education initiative of the Stanford Woods Institute for the Environment.

Related Topic: Student Leadership and Activities

More Information:

http://www.stanford.edu/group/anthropocene/cgi-bin/wordpress/

"Smart Grid" Must Juggle Diverse Resources While Cutting Costs and Carbon

The electricity transmission and distribution system of the future will need to cost-effectively manage intermittent renewable supplies, millions of price-responsive customers, huge batteries, and other widely distributed resources—while limiting fossil fuel–based generation. This may seem overwhelming, but participants in a "smart grid" workshop in April discussed a variety of new technologies and innovations that promise to enable deployment of such a system while driving down costs. "This is a very exciting time. In the next few years, I think we will be able to realize a lot of the potential," said Amit Narayan, who cochaired the TomKat Center for Sustainable Energy's workshop. Researchers, utility executives, investors, and technology start-up managers outlined a vision for transforming our current dilapidated electrical system into a smart grid. Reaching this goal will require overcoming high costs and significant barriers. "That's why a conference like this, which gathers leaders from across the energy spectrum, is important. No one area of expertise can solve all this," commented Stacey Bent, director of the TomKat Center. With such partnerships of academics and industry leaders, a nationwide smart grid may be on the horizon.

Related Topic: Interdisciplinary Research

More Information:

http://tomkat/activities/smartgrid-workshop-article-april2012.php

Faculty Explore Environmental Intersections at "Connecting the Dots" Symposium

How do we manage new energy technologies that require much cropland in a world short of food? How can agriculture be developed in countries already facing major water constraints? "The Water, Food, Energy, and Climate Nexus" was the topic of this year's Connecting the Dots, an annual symposium hosted by the TomKat Center for Sustainable Energy. Stanford experts from a range of disciplines discussed the interconnections and interactions among humanity's use of water, food, energy, and the environment. Drawing on their own research, speakers illustrated and evaluated some of the ways in which decisions in one resource area can lead to trade-offs or benefits in others. They examined sustainable freshwater resources and uses with a focus on Africa, Asia, and the western United States. Symposium attendees participated in breakout discussions led by Stanford graduate students and a postdoctoral scholar on a range of challenges associated with sustainable freshwater. By collaborating among disciplines, Stanford researchers have a greater potential to develop holistic solutions to global energy, climate, water, and food challenges.

Related Topic: Interdisciplinary Research

More Information:

http://connectingthedots.stanford.edu/

Bing Nursery School Goes Green with Water Conservation Measures

Bing Nursery School recently partnered with Zone C and the Grounds Department to improve the efficiency of its irrigation system, reducing its landscape water usage by 15%. The opportunities for improvement became apparent when Grounds staff noticed that the site's annual water consumption was unusually high. The Grounds Department conducted a site survey and found that irrigation was manually controlled instead of using the weather-based controllers common elsewhere on campus. In addition, site topography and a variety of different irrigation nozzles were leading to large disparities in the amount of water received by different portions of the site. Several modifications were implemented to conserve domestic water used for irrigation. These included turning over irrigation control to a weather-based system, adding more irrigation valves, and altering rotor spray nozzles to make watering more even. The joint effort of these campus groups produced changes that are expected to result in water savings of at least 15%, with a project payback of less than three years.

Related Topic: Water Conservation

More Information:

http://lbre.stanford.edu/sem/water_conservation

Tree's Pocket Guide Makes Its Way into Campus Wallets

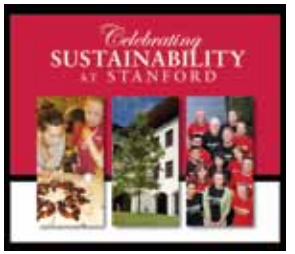
Did you know that if everyone on campus turned off office or dorm lights when they are not in use, Stanford could save over six million kWh per year? The new "Tree's Pocket Guide to a Sustainable Stanford" showcases this and other simple actions that can lead to significant campus savings. Designed to fit in a wallet or purse, the pocket guide features the Stanford Tree demonstrating the numerous sustainable choices individuals can make every day. The guide was based on the results of February's Sustainable Practices Survey, with savings calculated based upon the percentage of survey respondents reporting that they currently carried out each listed action. The Stanford Tree generously agreed to partner with the office to pose for fun and engaging photos. The Tree's Pocket Guide represents the first step in a new partnership between the Office of Sustainability and the Stanford Tree to highlight Stanford's commitment to sustainability.

Related Topic: Communications and Outreach

More Information:

http://earthday.stanford.edu

Stanford Celebrates Sustainability Achievements and Unveils Future Plans



Members of the Stanford community came together on May 7 to celebrate Stanford's sustainability successes while looking toward the future. "Celebrating Sustainability at Stanford" was hosted by the Office of Sustainability and featured speakers discussing sustainability achievements in academics, research, operations, and student life. The event lauded academic programs such as the Emmett Interdisciplinary Program in Environment and Resources, as well as the efforts of the Stanford Woods Institute for the Environment and the Precourt Institute for Energy to promote environmental and energy research. Also celebrated were Stanford's operational achievements, including the university's sustainable food and transportation programs, its leadership in green buildings, and the new Stanford Energy System Innovations (SESI) program. Campus leadership unveiled a new five-year strategic plan for campus sustainability, carefully developed by a consortium of faculty, staff, and students to provide a shared and actionable vision for making sustainability a core value on campus through leadership in teaching, research, and action.

Related Topic: Collaborative Governance

More Information:

http://sustainable.stanford.edu/celebrate

Green Living Council Improves Dorm Sustainability

The Green Living Council's mission is to teach and encourage the Stanford community to reduce waste and conserve energy and water by making easy lifestyle choices. From January through May, GLC coordinators launched a series of "Spreading Everyday Environmentalism in Dorms" (SEED) projects, outfitting ten Stanford residences with compost bins, shower timers, and reusable hand towels to promote environmentally friendly dorm living. These efforts were hugely successful. Measurements taken by GLC coordinators showed that during the five-month initiative, residents made composting, shower timing, and reusable hand towel use part of their routines. Students gave appreciative feedback, saying they used the new tools in their residences every day to compost their organic waste, monitor the length of their showers, and save paper towels. The GLC plans to expand the project next year and make small, environmentally-friendly actions the norm for all Stanford students.

Related Topic: Training and Education

More Information:

http://glc.stanford.edu/

Stanford GRID Alternatives Participates in National Energy Efficiency Workday

For six Stanford students, May 12, 2012, was not a typical Saturday. Sure, they had fun under the California sun as they ventured across the Bay Area, but along the way, they helped low-income families save an estimated $1,015 a year in energy and water bills. These students, members of GRID Alternatives: Stanford Campus Chapter (Stanford GRID), volunteered with Rebuilding Together Peninsula (RTP) to help with the annual Energy Efficiency Workday. RTP started this event in 2000, and Stanford has participated since 2005. The volunteers visited low-income-family homes and performed simple retrofits, including replacing incandescent bulbs with CFLs, cleaning refrigerator coils, and installing insulation around water pipes and doorways. Not only did the volunteers help the families save energy and money, but they gained invaluable hands-on experience that they can take back and share with their own communities. Stanford GRID hopes to continue this partnership with RTP while engaging more of the Stanford community by demonstrating how simple actions can make a world of difference both on and off campus.

Related Topic: Student Leadership and Activities

More Information:

http://www.rebuildingtogetherpeninsula.org/

Bike to Work Day Encourages Pedal Power

For more than 10 years, Stanford has participated in the annual Bike to Work Day, which encourages commuters to pedal their way to work. This year, Stanford hosted nine energizer stations, which recorded a total of 1,240 bike commuters, an increase of 10% from 2011. Bike commuters reported riding from as far away as San Francisco and Fremont. There were 227 Stanford commuters who reported their bike commute mileage: a total of 2,330 miles and an average of 10.3 miles per round-trip. The vehicle miles avoided on Bike to Work Day spared 2,213 pounds of CO_2 emissions. Stanford's Bicycle Program offered classes and promotions focusing on bike safety, including free how-to-fix-a-flat and bike skills classes in partnership with Stanford's Health Improvement Program. Participants in Stanford's Bike Safety Pledge—riders who pledged to follow the rules of the road and wear a helmet—were entered into a drawing to win a Fuji Crosstown 4.0 bike. The Campus Bike Shop also offered a bike tune-up special, resulting in 168 discounted bike tune-ups.

Related Topic: Transportation

More Information:

http://transportation.stanford.edu/btwd

SLAC Rolls Out Bottled Water Reduction Campaign

When SLAC National Accelerator Laboratory (SLAC) discovered that sitewide usage of bottled water was on the rise in 2009, it began working toward a more sustainable alternative. After evaluating many options and carrying out extensive sampling of the existing drinking fountain infrastructure, in October 2011 SLAC contracted with an outside vendor to install and maintain bottleless water filter units. The units are plumbed into tap water lines and equipped with a filtration system. As of May 2012, more than three-quarters of the new units were installed, replacing existing bottled water units. Work groups with staff deployed in the field, who were significant consumers of single-use bottled water, were given reusable bottles as a replacement. Overall, SLAC's bottled water usage has decreased by 72% from the November 2009 baseline. SLAC has lowered its usage of disposable water bottles by 85% and will continue to reduce that usage.

Related Topic: Waste Minimization

More Information:

http://www-group.slac.stanford.edu/esh/groups/ep/

BeWell Links Sustainability and Wellness

BeWell @ Stanford, the university's health and wellness initiative, promotes the synergies between sustainability and health. In May, for the third year in a row, Stanford Hospitality and Auxiliaries partnered with BeWell to host "A Healthy Taste of Stanford." The event showcased healthy, organic, local, and sustainable food options available at campus cafes and markets. The Office of Sustainability was on hand to provide education about compostable serviceware options on campus and encourage individuals to start office composting programs for food waste. BeWell and Office of Sustainability representatives also discussed the intersection of wellness and sustainability. The conversation touched on why sustainability matters, how personal wellness and sustainability intersect, and what individuals can do to make a difference in their personal lives and on campus. Just as personal wellness promotes long life for the individual, sustainability promotes long life for the human species. Wellness requires a healthy natural environment, and sustainability can help provide that. Thus, the two are linked both philosophically and in practice. Sustainable Stanford and BeWell will continue to partner to offer healthy and sustainable events and educational opportunities.

Related Topic: Behavior-Based Campaigns

More Information:

http://bewell.stanford.edu/sustainability

Efficient Research Computing Facility Opens in Forsythe

As part of the Sustainable IT initiative, IT Services recently renovated part of Forsythe Hall to provide a high-efficiency, high-performance computing environment. Server rooms demand some of the highest amounts of energy per square foot on campus and require both large amounts of electricity and significant cooling power. A specialized, central location for server room storage can realize significant energy savings. During the renovation, IT Services installed a significant number of detailed thermal sensors across the new space to provide more accurate temperature measurements. The redesigned building uses outside air for cooling whenever possible, such as at night and on cool days. The server racks have been reoriented to properly direct airflow and maximize cooling. The retrofit has led to a significant drop in operating costs and, as a result, Sustainable IT has gained design approval to invest more than $40 million to build the Stanford Research Computing Facility, an even more efficient space designed to accommodate additional high-density computing.

Related Topic: Energy Efficiency

More Information:

http://sustainableit.stanford.edu

Stanford Medical Center Recognized for Green Operations

Stanford University Medical Center (SUMC) received multiple commendations for green initiatives from Practice Greenhealth, the health care industry's nationally recognized leader in environmentally responsible operations. SUMC was designated as a Partner for Change with Distinction, an honor given to "health care facilities that have established environmental programs and continuously improve and expand upon these programs on the path to sustainability." SUMC was among 44 health care facilities nationwide to win the award this year. Practice Greenhealth also awarded a video about Stanford Hospital's green operating rooms an honorable mention in its first-ever video competition. SUMC has a long tradition of resource conservation: SUMC's recycling program has processed paper, beverage containers, and cardboard for more than 30 years, and in recent years SUMC has altered many basic procedures as a result of tracking resources more closely. SUMC has also taken steps to reduce overall energy and water use. Krisanne Hanson, the medical center's sustainability director, states, "Everything has the opportunity to come full circle if we pay attention to it and make smart decisions. We're caring for the environment within the environment of care."

Related Topic: Assessment and Evaluations

More Information:

http://stanfordhospital.org/newsEvents/newsReleases/2012/greening-the-or.html

Princeton Review's *Guide to Green Colleges* Includes Stanford for Third Consecutive Year

The Office of Sustainability completes major third-party sustainability evaluations and surveys throughout the spring and summer. The first organization to publish its 2012 results, the Princeton Review, in partnership with the U.S. Green Building Council, included Stanford in its annual *Guide to Green Colleges* for the third year in a row. Stanford was one of 322 schools (out of 768) that scored 80/100 points or more on a 50-question sustainability survey. The half-page profile highlights Stanford's investment in operational sustainability, its transportation demand management program, and the opportunities available for students to learn about and practice sustainability on campus. The *Guide to Green Colleges* is free and available to the public.

Related Topic: Assessment and Evaluations

More Information:

http://www.princetonreview.com/green-guide.aspx

Leading Research: New Academic–Industry Group Awards $7.5 Million to Lower Solar Costs

The Bay Area Photovoltaic Consortium (BAPVC), led by Stanford and the University of California–Berkeley, granted its first research dollars aimed at reducing the cost of solar power. The consortium, with funding from the U.S. Department of Energy, is providing $7.5 million to 18 teams of researchers at organizations including the Lawrence Berkeley National Laboratory, the National Renewable Energy Laboratory, Stanford, and UC Berkeley. The first round of grants is to be used to develop new technologies that can slash the costs of utility-sized solar power plants by 2020. Industry members of the consortium include GE, DuPont, and Corning. They help establish research priorities, contribute annually to support the work, and provide an inside track for commercializing successful results. Said BAPVC codirector Yi Cui, an associate professor of materials science and engineering at Stanford, "We have created an environment where universities and industry from across the country can communicate. It's really a national consortium."

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/may/bapvc-solar-grants-051712.html

Waste Minimization Continues with Hands-On Education

On a sunny Friday morning, a group of Stanford students and staff gathered to tour Newby Island Compost Facility to learn how Stanford's food waste begins a second life as compost. The experience, led by Julie Muir from Peninsula Sanitary Service, Inc., proved both fun and enlightening, leaving the visitors with a renewed appreciation for and dedication to composting efforts at Stanford. After a warm welcome to Newby Island (which receives all of Stanford's compostable and landfilled material), the visitors were shown to the grinding and chipping area, where compostable materials are ground up at a rate of 100 tons per hour. The material is then allowed to break down naturally for 80 to 90 days. Finished compost is sold to landscapers, farms, and land alteration projects. Stanford even back-hauls a certain amount of compost for use on campus. At Stanford's most recent landfill waste audit, 28% of the trash (by weight) was organic material and another 25% was recyclable material. The message seemed clear: the university is heading in the right direction but still has some way to go before it reaches a zero-waste goal.

Related Topic: Waste Minimization

More Information:

http://bgm.stanford.edu/pssi_food_composting

Leading Research: "Unzipped" Carbon Nanotubes Could Be Breakthrough for Fuel Cells

The platinum catalysts typically used in fuel cells are too expensive for large-scale production. A new technique could make carbon nanotubes a low-cost alternative and usher in wider use of fuel cells to generate clean energy. A carbon nanotube is a rolled-up, one-atom-thick sheet of pure carbon. Carbon tubes conduct electricity very well and are relatively inexpensive to make, but on their own they do not enhance the chemical reactions in a fuel cell nearly as well as platinum tubes. Stanford researchers discovered that shredding the outer walls of the carbon tubes and adding some iron and nitrogen impurities while leaving the inner walls intact enhances catalytic activity without degrading conductivity. A Stanford study published in May explains that the unzipped tubes could also replace precious metals as the catalyst in metal-air batteries, which have an energy density at least 10 times more than today's best lithium ion batteries. According to Hongjie Dai, a professor of chemistry and coauthor of the study, "developing a low-cost alternative to platinum has been a major research goal for several decades."

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/may/unzipped-carbon-nanotubes-052712.html

Stanford HVAC Shop Pilots Improved Filtration Media Solutions

Delivering high-quality air with low particulate counts to Stanford researchers is a priority for the university's HVAC shop. When the shop discovered vulnerabilities in the connections between traditional filter rack installations, including a lack of proper sealing, blow-by potential, and moisture-driven degradation of filtration media, it embarked on a pilot project to find a solution. The shop identified a custom-designed, powder-coated, double-gasketed, rigid filter rack with a knife edge for better sealing. Coupled with installation of a gasketed and water-resistant plastic and polypropylene filtration medium, this new solution reduced particulate counts dramatically. The improved filtration medium, a 12-inch V-bank style installed everywhere space allows, has a low pressure drop, resulting in significant fan energy savings. In a pilot installation at the Clark Center, annual calculated savings totaled more than $26,000, and comparable savings are expected in buildings across campus. Maintenance costs and the inconvenience of equipment shutdowns are also minimized, since the new filters require replacement annually instead of quarterly. The shop has also installed the new filtration solution at Forsythe, Gilbert, and Durand, and plans to continue similar replacements throughout the entire campus in the coming years.

Related Topic: Energy Efficiency

More Information:

http://bgm.stanford.edu/groups/build_maint/build_eng_trades

Students and Housing Partner to Reduce Waste during Move Out

The end of the school year is a time for celebration, but it can also be a time of overflowing dumpsters and needless waste, as students rush to clear accumulated belongings from their rooms before leaving campus. This year, Student Housing worked to prevent waste by expanding the Green Move Out program. A wide range of dorms on campus were provided with charity bins to collect gently used clothing, books, and other items. Peninsula Sanitary Service, Inc./Stanford Recycling Center provided information on recycling odd items such as sneakers, electronics and small appliances, and hazardous household waste. The Green Living Council held its third annual "Green Free Store" event on two separate days, inviting all members of the campus community to drop off reusables they no longer wanted and/or pick up items donated by others. The event encouraged students to think twice before tossing items in the trash and helped contribute to the goal of a zero-waste Stanford.

Related Topic: Food and Housing

More Information:

https://www.stanford.edu/dept/rde/cgi-bin/drupal/housing/move/greenmoveout

Stanford Woods Institute Awards 2012 Environmental Venture Project Grants

The Stanford Woods Institute for the Environment awarded five new Environmental Venture Projects (EVP) grants for interdisciplinary research aimed at finding practical solutions to major environmental and sustainability challenges. The projects received two-year grants totaling $833,000 to tackle a broad range of challenges, bringing the total amount awarded since the program began in 2004 to more than $7.2 million.

The five projects selected this year embody the EVP mission to harness interdisciplinary research to promote global sustainability. The projects are Recovery of Entropic Energy at Wastewater Treatment Plants Discharging to Saline Environments; Determining the Drivers and Consequences of Hypoxia in Nearshore Marine Ecosystems: An Integrative Engineering and Ecophysiological Approach; Is Corporate Environmentalism Profitable? Experimental Investigations of the Effects of Environmental Corporate Social Responsibility on Consumption, Employment and Political Activity; Trace Organics in Recycled Water: Analysis of Plant Uptake and Processing; and Rapid Detection of Water-Borne Pathogens and Pathogen Indicators by Digitization and Concentration of Report Enzyme Fluorescence in Microfluidic Picoliter Droplets.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/june/woods-evp-awards-062112.html

Hollywood Connections Sharpen Clean Energy Vision

Stanford scientists often develop groundbreaking technologies, but getting those technologies adopted can be a challenge. In 2009, Professor Mark Jacobson, a senior fellow with the Stanford Woods Institute for the Environment and the Precourt Institute for Energy, published a comprehensive plan to power the entire world with renewables by 2030. The plan received much press, and Professor Jacobson has been partnering with fellow scientists, businesspeople, and even celebrities to galvanize action. Mark Ruffalo, the actor who plays scientist Bruce Banner (aka "The Hulk") in the blockbuster film *The Avengers*, visited campus for an informal discussion with students about the need for renewable energy and the importance of Professor Jacobson's plan. Ruffalo has been speaking out to social media followers and the blogosphere and cowrote an op-ed about the plan with Jacobson in the Huffington Post in early June. Professor Jacobson's plan is a "grand vision" involving science, economics, policy, finance, multimedia, and activism. His next step is to focus on engaging policymakers.

Related Topic: Interdisciplinary Research

More Information:

http://www.huffingtonpost.com/mark-ruffalo/clean-electricity-energy_b_1588265.html

http://woods.stanford.edu/focal.php?name=clean-energy-ruffalo

http://www.scientificamerican.com/article.cfm?id=a-path-to-sustainable-energy-by-2030

Trustees Enact Energy Efficiency Proxy Voting Guidelines

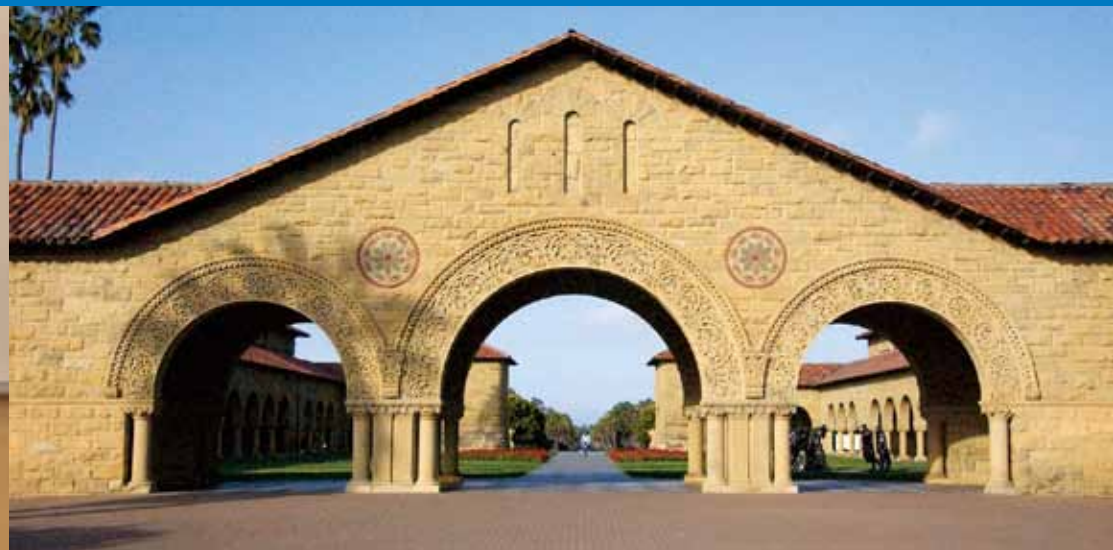
Stanford's endowment is the backbone of the university, and the trustees take the integrity of Stanford's investments very seriously. In June, the Board of Trustees issued a new energy efficiency proxy voting guideline. The guideline, as stated in the *Stanford Report*, is that "Stanford University votes 'yes' on reasonable resolutions requesting that companies set goals, monitor and report on progress to increase the energy efficiency of operations and products. Stanford University votes 'no' on shareholder resolutions...which are clearly inconsistent with these principles in whole or in part." The new guideline was recommended by Stanford's Advisory Panel on Investment Responsibility and Licensing, which advises the Board of Trustees and the university president on ethical concerns about potential endowment-held securities whose business policies and practices could cause "substantial social injury." Board of Trustees chair Leslie Hume said the new guideline is "very tangible evidence of Stanford's commitment to sustainability and energy efficiency."

Related Topic: Collaborative Governance

More Information:

http://news.stanford.edu/news/2012/june/trustees-projects-initiatives-061912.html

http://apir.stanford.edu/documents



Stanford Sends Team to National Clean Energy Competition

A Stanford team with a novel idea finished in the top six at the U.S. Department of Energy's (DOE's) National University Clean Energy Business Challenge. The Stanford team's project beat out more than 60 other university teams to win the competition's western regional segment in May, earning it a $100,000 prize and a trip to Washington to compete in the finals. Stanford's team presented a new low-cost technology that removes nitrogen from wastewater while generating energy. The technology is an important part of a larger effort at Stanford to develop economical and energy-efficient ways of recovering clean water and other valuable products from wastewater. Current wastewater treatment in the United States is energy intensive and not focused on resource recovery. "Being selected as a clean-tech finalist by the DOE is a tremendous honor," team member Yaniv Scherson said. "It shows the promise and opportunity in water technologies. We are very grateful for the recognition."

Related Topic: Interdisciplinary Research

More Information:

http://techportal.eere.energy.gov/commercialization/natlbizplan.html

http://news.stanford.edu/thedish/?p=19969

2012 California Higher Education Sustainability Conference Recognizes Stanford Staff

Stanford made a strong showing at the annual California Higher Education Sustainability Conference, held in Davis, California. University staff gave presentations at 10 separate sessions on topics such as climate action, sustainability governance, transportation, energy efficiency, food systems, and creating a culture of sustainability.

In addition, Fahmida Ahmed, director of Stanford's Office of Sustainability (photo right), earned a Sustainability Champion award, which recognizes "an individual who has been a role model to their peers around the state; has promoted sustainability throughout their campus and beyond; achieved results; and who truly embodies the term 'leader.'" Since joining Stanford's staff in 2008, Ms. Ahmed has made numerous contributions to Stanford's campus sustainability and beyond. Most recently, she forged a partnership between the UC system and the Ivy Plus consortium to influence national sustainability evaluations. She now holds the distinction of being the inaugural recipient of the Private College Sustainability Champion Award.

Related Topic: Assessment and Evaluations

More Information:

http://www.cahigheredusustainability.org/awards/2012Winners.aspx

Annual Energy Summit Delves into Sustainable Business Practices

At the Precourt Energy Efficiency Center's annual conference, hundreds of facilities managers, researchers, green tech investors, and government officials explored "workable ideas for sustainable business." The Silicon Valley Energy Summit covered the best practices, technological advances, and policy developments related to more sustainable energy use. Topics included the role of start-ups and social media in fostering energy efficiency, the innovations needed to get electric cars into the mainstream, the implications of low-cost, abundant natural gas, and the pros and cons of certification systems such as LEED and Energy Star. Major addresses focused on energy policy from both a federal and a state perspective. The summit succeeded in sharing energy successes while providing an overview of the remaining hurdles to be overcome in creatining a carbon-neutral economy.

Related Topic: Interdisciplinary Research

More Information:

http://peec.stanford.edu/events/2012/sves/

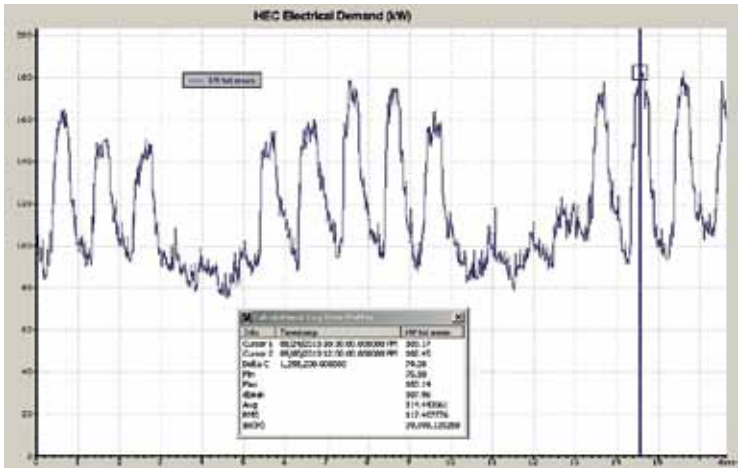
Stanford Staff Model and Verify Green Building Performance

Green buildings are increasingly popular in the United States, but they sometimes consume far more energy than predicted by original design models. Building on more than a century of sustainable building practices, Stanford is leading the way in monitoring actual building performance to ensure that buildings meet design goals. After spending several years piloting performance monitoring, Stanford recently formalized its modeling methodology with the Lokey Stem Cell Research Laboratory (SIM1) project. Campus engineers reexamined the building after a year of occupancy and compared actual to predicted trends. They found that some original demand estimates—for example, the plug load for lab space—varied considerably from actual use. In fact, the building was using 50% less electricity than had been projected. By recalibrating its energy model for actual conditions, engineers were able to analyze whether the building has met energy and water performance goals. The data will also help engineers create more accurate occupancy and energy use predictions for future campus building projects.

Related Topic: Energy Efficiency

More Information:

http://sustainable.stanford.edu/green_buildings



Stanford Earns Gold Rating

Stanford's overall sustainability performance has earned a gold rating from the Association for the Advancement of Sustainability in Higher Education (AASHE). Data from campus operations, academic, and institutional programs representing over 30 departments and organizations were collated and submitted to AASHE's Sustainability, Tracking, Assessment, and Rating System (STARS). The full assessment is available online. Highlights of Stanford's submission include a perfect score in the Coordination and Planning section, strong performance in the Research section, and the attainment of all possible Innovation credits. Out of AASHE's 1,000-plus members, Stanford became one of just 35 to earn a gold STARS rating, the highest level awarded to date. As a charter participant in STARS, Stanford engaged in substantive dialogue with AASHE to influence the maturation of the rating system, which is now the main data source for all third-party sustainability evaluations.

Related Topic: Assessment and Evaluations

More Information:

https://stars.aashe.org/

https://stars.aashe.org/institutions/stanford-university-ca/report/2012-06-29/

http://news.stanford.edu/thedish/?p=20095

Students Assess Stanford's Solar Resource

Stanford's students frequently partner with the university administration to effect sustainable operations. Most recently, Stanford Solar and Wind Energy Project (SWEP) partnered with the department of Sustainability and Energy Management (SEM) to gather information about the campus's available solar resource. The students studied the potential to install solar PV panels on campus and researched the current state of the solar market to determine the feasibility of such a technology in the context of an educational institution. This research included identifying federal and state incentives while taking into account the political climate and its effect on solar feasibility. The students also conducted site surveys and modeled a solar system for use on some student row houses. Their work has helped inform Stanford's Energy and Climate Plan, which proposes to incorporate solar PVs into the campus' future energy supply. SWEP continues to be an invaluable resource for SEM and has shown that students are enthusiastic, dedicated, and willing to assist the university administration in implementing sustainability best practices.

Related Topic: Energy Efficiency

More Information:

http://sustainable.stanford.edu/green_buildings

Leading Research: Microbes Make Methane Gas by Pulling CO_2 Out of the Air

Microbes that convert electricity and CO_2 into natural gas could make solar power available at night. Stanford scientists are raising colonies of microorganisms known as "methanogens" that have the remarkable ability to turn electric power into pure methane, the main form of natural gas. Ideally, the organisms would get their electricity from emissions-free power sources like solar cells and wind turbines. Currently, when the sun sets or the wind dies, renewable power is replaced by power from gas–fired generators. Natural gas–generated methane produces greenhouse gases by burning hydrocarbons trapped underground for eons. The methane produced by the microbes is carbon neutral, because their carbon source is CO_2 in the atmosphere. Professor Alfred Spormann, the project's lead researcher, explains: "Microbial methane is much more ecofriendly than ethanol and other biofuels. Corn ethanol, for example, requires acres of cropland, as well as fertilizers, pesticides, irrigation and fermentation. Methanogens metabolize methane in just a few quick steps." He continues: "If we can engineer methanogens to produce methane at scale, it will be a game changer."

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/july/microbes-clean-methane-072412.html

SLAC Cultivates Strategy for Zero-Waste

Over the years, the SLAC National Accelerator Laboratory has taken large strides in the diversion of municipal nonhazardous solid waste. In 2011 it went one step further by developing a Municipal Waste Reduction Plan (MWRP) that implements zero-waste principles. Previous waste characterization studies at SLAC indicated that as much as 77% of material going into the landfill bins could be diverted through composting or recycling. Under SLAC's new zero-waste pilot program, building occupants are responsible for sorting their own trash, recycling, and depositing compostables such as food waste in collection areas across the building. Lone or stranded trash containers are replaced by co-located recycling and trash containers in common areas such as conference rooms and lobbies. SLAC is in the process of testing this new model, and thus far the results have been positive. The MWRP will continue to serve as a roadmap for SLAC as the testing phase is completed and implementation is expanded.

Related Topic: Waste Minimization

More Information:

http://www-group.slac.stanford.edu/esh/groups/ep/

Panama Mall Renovation Enhances Campus Sustainability

Stanford has been gradually returning to the original 1890 Olmsted campus plan by placing new construction along the original central campus axis. The multiphase restoration of Panama Mall converts a service-oriented back street into a main boulevard for the buildings along it. It provides clearer, safer bike and pedestrian travel routes while accommodating service functions. Seating areas offer opportunities for outdoor academic programs and social interaction. Sustainable features include deciduous trees to provide shading and cooling for the southern building faces, a greater amount of permeable surface for groundwater recharge, and the salvage and reuse of entry plaza pavers from past Stanford projects. All phases incorporate bike parking, and Phase 4 converts the two-way service road into a one-way road for vehicles only, in order to reduce traffic and accommodate sidewalks on the south side of the street. Through projects like this one, Stanford continues to create an environmentally sustainable, beautiful, and inviting campus.

Related Topic: New Buildings and Renovations

More Information:

http://lbre.stanford.edu/architect/sip

Stanford Expert Testifies Before Congress on Climate Change

Stanford Professor Chris Field testified before the Senate Committee on Environment and Public Works about the pressing need to address climate change. Field, a professor of biology and environmental earth system science, founding director of the Carnegie Institution's Department of Global Ecology, senior fellow at the Stanford Woods Institute for the Environment, and faculty director of Stanford's Jasper Ridge Biological Preserve, has led research for nearly two decades on the responses of California grasslands to climate change, and is a leading member of the Intergovernmental Panel on Climate Change.

The contentious committee hearing was intended to update lawmakers on the latest climate change science. Field's testimony emphasized how climate change will influence local weather extremes such as heat waves, heavy rains, and droughts. Field's testimony and extensive research on the subject aim to inform policymakers and help them to develop plans that mitigate damage from climate change. Field's Senate testimony exemplifies the profound impact of sustainability research at Stanford.

Related Topic: Interdisciplinary Research

More Information:

http://news.stanford.edu/news/2012/august/field-capitol-hill-080112.html

Stanford Earns Third Place Ranking in *Sierra* Magazine's "Cool Schools" Survey

For the third consecutive year, Stanford was recognized in *Sierra* magazine's "Cool Schools" sustainability ranking, which solutes U.S. colleges and universities that are helping solve climate problems and are making significant efforts to operate sustainably. This year Stanford earned third place, its best "Cool Schools" ranking to date. Published in the September/October 2012 issue of *Sierra*, the feature story on the rankings highlights Stanford's organic gardens, which grow fruit, vegetables, and even wheat and barley used for bread and beer-making classes. Stanford continues to pursue excellence in the practice of sustainability in teaching, research, and action, and values its national leadership role.

Related Topic: Assessment and Evaluations

More Information:

http://www.sierraclub.com/coolschools

Sustainability at Stanford
A Year in Review
2011–12

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Peninsula Sanitary Services Inc

Precourt Energy Efficiency Center

Precourt Institute for Energy

Residential & Dining Enterprises

School of Earth Sciences

School of Engineering

School of Medicine

SLAC National Accelerator Laboratory

Stanford Alumni Association

Stanford Farm Project

Stanford Law School

Stanford Solar and Wind Energy Project

Stanford University Medical Center

Stanford Woods Institute for the Environment

Students for a Sustainable Stanford

Sustainability and Energy Management

Undergraduate Advising and Research

University Architect / Campus Planning and Design

University Communications

University Human Resources

Vice Provost for Graduate Education

Vice Provost for Undergraduate Education

Zone Management

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We have a very simply stated but audacious goal: that Stanford should be the leader in sustainability in everything we do, and that we will lead by example. In order to do this we will ensure that sustainability is a top and lasting priority for the university as a whole in research, teaching, operations, and other actions.

— Pamela Matson
Chester Naramore Dean of Earth Sciences
Stanford University

Over the past decade rapid awareness of the challenges our planet faces has emerged. Here at Stanford, this raised awareness has led to many accomplishments. We have made great progress, and look forward to continuing our work together.

— Robert Reidy
Vice President, Land, Buildings, and Real Estate
Stanford University

"Setting an example is not the main means of influencing others; it is the only means"

— Albert Einstein

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