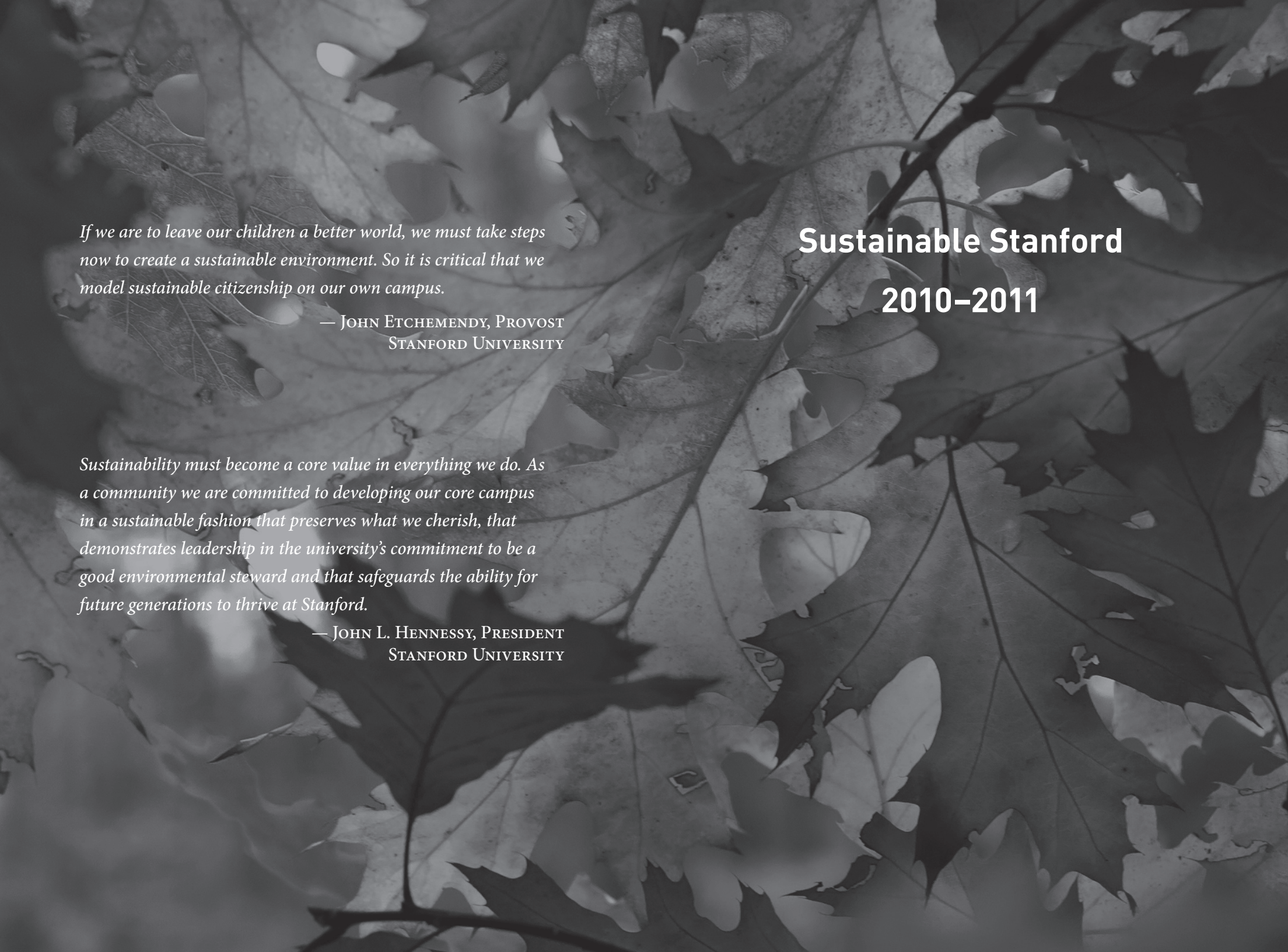
SUSTAINABLE STANFORD

A Year In Review 2010-2011



Sustainable Stanford

2010–2011

If we are to leave our children a better world, we must take steps now to create a sustainable environment. So it is critical that we model sustainable citizenship on our own campus.

— John Etchemendy, Provost
Stanford University

Sustainability must become a core value in everything we do. As a community we are committed to developing our core campus in a sustainable fashion that preserves what we cherish, that demonstrates leadership in the university's commitment to be a good environmental steward and that safeguards the ability for future generations to thrive at Stanford.

— John L. Hennessy, President
Stanford University

WELCOME MESSAGE

Greetings from Stanford's Office of Sustainability! We are pleased to present the 2010–2011 edition of ***Sustainable Stanford—A Year in Review***, which showcases the strides forward to integrate sustainability at Stanford. Our university has been a leader in environmental sustainability for decades. Although this has been acknowledged on campus for some time, recent third-party evaluations affirm that national standing. Stanford earned second place in *Newsweek*'s 2011 composite ranking of the nation's greenest colleges. It once again ranked fifth among Sierra magazine's Cool Schools. Stanford also received a top-tier ranking on the Sustainable Endowments Institute's Green Report Card in 2009 and 2010 and received the top grade in all operational areas.

Stanford's dedication to sustainability is palpable. The remarkable decrease in resource use despite significant campus growth underscores Stanford University's vision, commitment, and implementation experience in the realm of environmental sustainability. In recent years, Stanford has multiplied its efforts. We have not only made key advances in the concept, design, construction, and operation of the campus, we have also started to lay the foundations for a culture of sustainability. It is no longer just a metric for efficiency or a special interest for some departments and groups on campus. Integrated into academics, operations, communications, and events, sustainability as a **core value** is transcending academic and infrastructural achievements, showcasing its value-add to environmental footprint, resources savings and community engagement. Sustainability is now observable in the campus culture.

This publication summarizes operational and programmatic milestones, presents metrics and trends, and provides a chronological snapshot of various noteworthy initiatives and accomplishments by academic and operational departments. Some initiatives are mature, others new. Some programs are intended for long-term implementation, while others concluded this year. All are strategic and collaborative parts of the integrated design and flourishing culture of sustainability at Stanford.

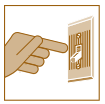
As you consider the milestones, trends, and stories presented in the pages that follow, you will see how many of them already balance the economic, environmental, and societal aspects of sustainability. Our office's work will continue to support each initiative so it can achieve its full potential and expand the value of sustainability at Stanford.

As a preamble to the next publication, we wish to share with you the 2011-2012 campus-wide strategic planning initiative currently called Sustainability 2.0. This effort will convene faculty, staff, and students across campus under a planning framework to answer key strategic questions around academic and operational sustainability. This unprecedented and collaborative planning will identify a shared vision and yield a roadmap to be unveiled at a celebratory event in spring 2012. We hope to celebrate our accomplishments and ongoing journey with all of you, our reason and inspiration for success at Stanford.

Sincerely,

Fahmida Ahmed
Office of Sustainability

TOPIC AREA GUIDE


Behavior


Buildings


Climate Action


Community Outreach


Energy


Events


Food


Investments


Land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Research


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Sustainable IT


Transportation


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LEADERSHIP IN SUSTAINABILITY

Sustainability and Energy Management (SEM), a department within Land, Buildings & Real Estate (LBRE), leads initiatives in campus infrastructure and programs in energy and climate, water, transportation, green buildings, and sustainable information technology, as well as various special initiatives. The **Office of Sustainability** connects campus organizations and entities and works collaboratively with them to steer sustainability initiatives to fulfill President Hennessy's vision that sustainability will become a core value in everything we do. The office focuses on strategic planning, evaluations and reporting, communication and outreach, academic integration, conservation campaigns, and campus outreach.

Major support for these efforts is provided by various operational units within LBRE, Residential & Dining Enterprises (R&DE), Stanford Recycling Center (run by Peninsula Sanitary Service, Inc., PSSI), University Communications, Government and Community Relations, Woods Institute for the Environment, Precourt Institute for Energy, School of Medicine, Graduate School of Business, School of Earth Sciences, Alumni Association, and numerous student organizations.

From utilities to food systems, hundreds of professionals throughout the Stanford community are involved with sustainability projects in their daily work. The full-time sustainability professionals are listed below, organized by group name.

Department of Sustainability and Energy Management

Joseph Stagner
Executive Director, SEM
jstagner@stanford.edu
Joe leads the Sustainability and Energy Management Department, which includes over ninety staff members in Utilities, Parking & Transportation, Business Services, and the Office of Sustainability. He cochairs the Sustainability Working Group and leads the university's long-range sustainability infrastructure planning and implementation.

Sustainability Office

Fahmida Ahmed
Associate Director, Office of Sustainability, SEM
fahmida@stanford.edu
Fahmida directs the Office of Sustainability and the campus program Sustainable Stanford. She cochairs the Sustainability Working Group, connects the Sustainability Working Teams, coordinates implementation of sustainability projects, supports Stanford's long-term resource infrastructure planning, and manages the office's communications and evaluation programs.

Jiffy Vermylen
Sustainability Coordinator, Office of Sustainability, SEM
jiffy.vermylen@stanford.edu
Jiffy supports further development and implementation of the campus-wide Sustainable Stanford initiative. Her portfolio includes rollouts of the department/building-level conservation programs, related communications with and training for the campus community, and overall program evaluation standards and criteria, especially for the built environment.

Heather Benz
Student Associate, Office of Sustainability, SEM
hbenz@stanford.edu
Heather supports the Office of Sustainability's programs and services. She manages the production of the Student's Guide to Sustainable Living at Stanford, supports the Student Green Fund, and provides equipment support for building-level resources. She also represents Sustainable Stanford at events and assists with event coordination.

Energy Management

Energy Services

Robert Reid
Associate Director, Energy Services, SEM
Robert.Reid@stanford.edu
Robert manages energy services at Stanford, which entails the production of electricity, steam, and chilled-water supplies on campus. His role includes oversight of the procurement and production of those commodities as well as mechanical operations of the Central Energy Facility.

Power Systems

Rich Bitting
Associate Director, Power Systems, SEM
rbitting@stanford.edu
Rich directs the Power Systems department, which includes responsibility for the campus electrical distribution system and streetlights. Within the department, a staff of engineers, supervisors, and technicians ensures that the campus has an efficient and reliable supply of electricity.

Thermal Energy Distribution

Dean Murray
Associate Director, Steam Systems, SEM
deanm@bonair.stanford.edu
Dean manages the steam, hot-water, and chilled-water underground piping system distribution. His department includes steamfitters, the Steam Shop supervisor, and engineers for the distribution piping systems. Dean ensures delivery of heating and cooling services to academic buildings, housing and dining facilities, athletic facilities, and the Stanford Medical Center.

Facilities Energy Management

Gerry Hamilton
Associate Director, Facilities Energy Management, SEM
gerryh@stanford.edu
Gerry directs the activities of Stanford's Facilities Energy Management program, including the operation of campus building energy management systems, oversight of the university's Sustainable IT program, and supervision of building energy retrofit projects. The program ensures that buildings and associated processes are operated efficiently and that new facilities incorporate best practices for energy use.

Joyce Dickerson
Director, Sustainable IT, SEM
jdickerson@stanford.edu
Joyce leads Sustainable IT, the university-wide effort to reduce carbon emissions associated with computing infrastructure. Her focus includes personal, administrative, and high-performance computing, and targets equipment from desktops to data centers. Joyce functions as a liaison between LBRE and IT Services to develop integrated solutions for energy efficiency challenges. She also works with departments campus-wide to identify and implement Sustainable IT programs.

Scott Gould
Senior Energy Engineer, Building Energy Systems Commissioning, SEM
scottg@bonair.stanford.edu
Scott works closely with campus stakeholders to identify energy efficiency opportunities in new construction projects and to ensure the design teams of architects and engineers understand energy and water goals established for new projects. He also leads renewable energy projects on campus, including a study of the total potential for solar energy on campus and installation of several photovoltaics systems, including the 30kW system at Reservoir 2 in the Stanford foothills and the 40kW system at the Hoover House.

Marc Epstein
Manager, Facilities Energy Systems Operations, SEM
epsteinm@stanford.edu
Marc supervises the university's controls engineers and technicians. He leads ongoing support of the centralized Energy Management and Controls System and various Building Management Systems. Marc oversees multiple programs aimed at improving controls integration, enhancing real-time performance monitoring, and ensuring high-quality building commissioning.

Susan Vargas
Manager, Demand-Side Energy, SEM
susank@stanford.edu
Susan works to improve the energy performance of the university's 15 million square feet of existing buildings. Susan administers the Energy Conservation Incentive Program to promote conservation and sustainable procurement. She oversees both a $1 million program and a $15 million capital program to identify, coordinate, and fund efficiency retrofit projects.

Leslie Kramer
Senior Energy Engineer, Facilities Energy Management, SEM
lfkramer@stanford.edu
Leslie focuses on improving the energy efficiency of the largest energy-consuming buildings on campus through the Whole Building Retrofit Program. She works with stakeholders within Facilities Energy Management, Zone Management, and operational entities to identify and implement projects that save energy and money while maintaining or improving overall building performance. She also helps track the persistence of energy savings from these projects over time.

Shalini Singh
Energy Engineer, Facilities Energy Management, SEM
singhsha@stanford.edu
Shalini supports the conservation and technology efficiency projects across Stanford's existing building portfolio. She supports implementation of the Energy Retrofit Program and the Whole Building Retrofit Program. Shalini works across groups in Zone Management, Building Energy Systems, and Operations to align energy efficiency goals.

Water Services and Civil Infrastructure

Tom Zigterman
Associate Director, Water Services & Civil Infrastructure, SEM
twz@stanford.edu
Tom manages a group of engineers, scientists, and water technicians who are responsible for operation of Stanford's water supplies, including domestic water, surface water, wastewater, and storm drainage systems, as well as other civil infrastructure, including dams, bridges, and roads. He also chairs the Water Sustainability Working Team, which is currently planning the long-term sustainable management of Stanford's water supply and demand.

Marty Laporte
Associate Director, Environmental Quality & Water Conservation, SEM
martyl@bonair.stanford.edu
Marty manages Stanford's Environmental Quality and Compliance Program for campus waters, wastewater, soils, Facilities and Utilities hazardous materials, and underground storage tanks. She also manages Stanford's Water Conservation Program, which tests new technology, including high-efficiency fixtures, and oversees the implementation of campus-wide upgrades and new building water efficiency standards.

Parking and Transportation

Brodie Hamilton
Director, Parking & Transportation Services, SEM
brodie.hamilton@stanford.edu
Brodie leads Stanford's transportation programs, which include parking and retail operations, an award-winning transportation demand management program, a bicycle program, the Marguerite shuttle service, charter services, transportation program planning and development, and marketing communications. He is a member of Stanford's Sustainability Working Group.

Lisa Kwiatkowski
Manager, Transportation Demand Management and Outreach, SEM
lisakwi@stanford.edu
Lisa leads the marketing and communications efforts for Stanford's Parking & Transportation Services department, with a focus on promoting alternative transportation through Stanford's Commute Club and other incentive programs. These efforts helped reduce the university's employee drive-alone rate from 72% in 2002 to 46% in 2011.

Rachel Maiss
Transportation Demand Management Coordinator, SEM
rmaiss@stanford.edu
Rachel supports the university's transportation demand management program and coordinates alternative transportation promotion efforts at Stanford Research Park. She also helps members of the Stanford community understand the many alternative travel options available.

Ariadne Scott
Bicycle Program Coordinator, Parking & Transportation Services, SEM
adscott@stanford.edu
Ariadne leads the bicycle program for Stanford's 8,000-acre campus, which is designated a Platinum-Level Bicycle Friendly University by the League of American Bicyclists (LAB). She is LAB Road 1 certified, coteaches bike safety classes, lives "car free," and supports and encourages student bicyclists and the 21.7% of employees who bike-commute to and from Stanford.

Purchasing & Payable Services

Stefani Fukushima
Manager, Purchasing Operations
stefanif@stanford.edu
Stefani leads sustainability efforts for Stanford's Purchasing & Payable Services Department, with a focus on campus-wide environmentally preferred purchasing strategies. Her work includes programs that support resource conservation, order consolidation, purchase of reusable goods, and identification of sustainable alternative products and services. Stefani works closely with university departments and other central offices to negotiate supplier and service provider contracts that support the university's sustainability initiatives.

Residential & Dining Enterprises

Matt Rothe
Sustainability Manager, Stanford Dining Services
mrothe@stanford.edu
Matt works closely with other employees of Stanford Dining on sustainable food procurement, waste reduction, on-campus food production, and creation of awareness through events and educational opportunities. He also manages student gardeners and interns, assists faculty with classes related to food and agriculture, and coordinates with other staff to promote sustainable initiatives.

Campus Planning and Design

Catherine Deino Blake
Associate Director, University Architect/ Campus Planning & Design
cathyb@stanford.edu
Cathy directs landscape design and site furnishings at Stanford, including the preparation of campus plans, design guidelines, and campus standards. She provides input into and reviews all major capital project designs and develops conceptual designs for campus projects, including landscape plantings, malls, courtyards, and plazas; vehicular, bike, and pedestrian travel; and parking.

Eva Rose Leavitt
Campus Planner, University Architect/ Campus Planning & Design
eval@stanford.edu
Eva supports the development of site and design guidelines for new buildings, landscape plans for small projects, implementation of campus furnishing and paving systems, and advocacy of responsible stewardship of the land through sustainable design. She works with the Campus Landscape Architect to implement outdoor infrastructure programs.

Peninsula Sanitary Service, Inc.

Julie Muir

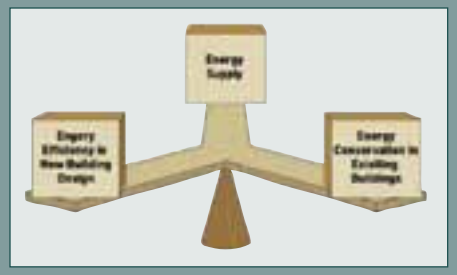
Community Relations Manager, PSSI / Stanford Recycling Center
juliem@pssi.stanford.edu
Julie leads the construction and demolition waste diversion program and the food waste collection and composting program. She also continues to expand campus recycling services. She advocates for a zero-waste campus through a comprehensive program of waste reduction, reuse, recycling, composting, and sustainable purchasing. Julie has led over 20 audits of campus trash to provide the Stanford community with meaningful data to improve targeted waste reduction.

Sustainable Stanford 2010-2011

Feature

Developments and Highlights

Sustainable Infrastructure—Stanford's Energy and Climate Plan



A balance among high-efficiency standards for new construction, continued efficiency programs for existing buildings, and a cutting-edge energy supply will facilitate significant emissions reductions.

Cooling towers expel waste heat at Stanford's current Central Energy Facility.

Stanford's first regional heat exchange station went online in August 2010.

A Growing University to Support Its Academic Mission

Situated on 8,080 acres, Stanford requires a significant amount of energy to support its academic mission and the research functions housed within more than 1,000 campus buildings. Efficiently managing energy supply and demand, as well as the corresponding greenhouse gas (GHG) emissions, is therefore critical to the university's future operations.

Stanford joined the California Climate Action Registry (CCAR) in 2006 and has prepared third-party-verified inventories of Scope I and II GHG emissions for the main campus each year since. In 2010 the university transitioned to the Climate Registry, an international North American emissions registry. In addition to the official inventories, Stanford prepares unofficial inventories of its Scope III emissions as well as those attributed to steam and chilled-water deliveries to Stanford Hospital and Clinics from the Central Energy Facility (CEF). At present, Stanford's total emissions exceed 260,000 metric tons of carbon-dioxide equivalent, and that number is expected to increase as the university expands its academic offerings.

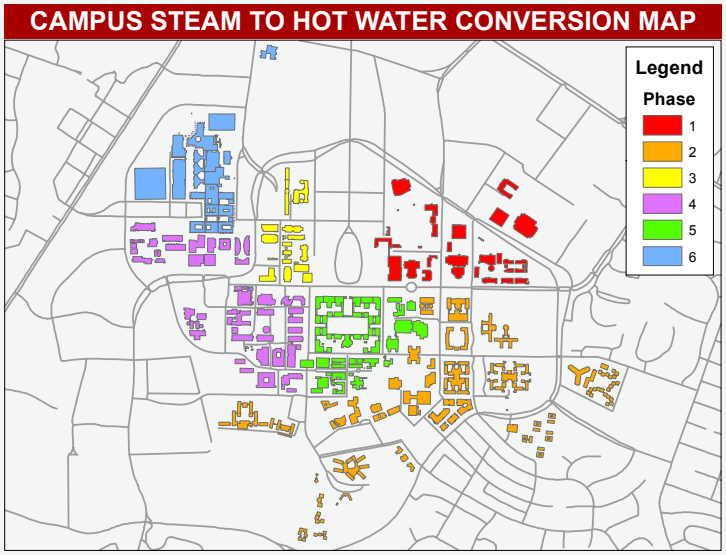
Historic Conservation and Efficient Operations

Since the 1980s, Stanford has employed best practices to minimize the cost and environmental impact of its operations. The campus has employed energy metering in all its facilities, used efficient natural-gas-fired cogeneration for its energy supply, retrofitted buildings with efficient systems, implemented stringent building standards, invested in renewable power, conserved water, and reduced automobile commute emissions to 1990 levels. Now, Stanford accepts the challenge to go beyond these efforts and raise the bar in the use of innovative and renewable energy supplies to further reduce its environmental impact and operational cost.

The Balanced Approach to Climate Action Solutions

Stanford's long-range Energy and Climate Plan, developed collaboratively, peer reviewed, and incorporating both engineering and financial models, presents a three-pronged approach to improve infrastructure and dramatically reduce GHG emissions, despite campus growth and without relying on market carbon instruments. The plan presents an adept balance among high-efficiency standards for new construction, continued efficiency programs and improvements within existing buildings, and a cutting-edge energy supply system.

Given that energy production at the CEF produces 90% of Stanford's GHG emissions and consumes 25% of the campus's potable water supply, changes to Stanford's energy supply are the major focus of the Energy and Climate Plan. As a result of the significant overlap between campus heating and cooling needs, the plan outlines an innovative heat recovery design that is 70% more efficient than existing CEF operations. Waste heat collected from buildings via the chilled-water loop will be captured at the CEF for reuse, eliminating the use of conventional chillers to discharge waste heat out of cooling towers by 70%. Instead, heat recovery chillers will move the waste heat collected from the chilled-water loop to a new hot-water loop scheduled to replace Stanford's aging steam distribution system. In addition to reducing the university's GHG emissions to 20% below 1990 levels by 2020, heat recovery will enable an 18% savings in potable water consumption.



Implementation Under Way

The conversion of over ten miles of steam pipelines covering the entire campus to hot-water piping has already begun on an as-needed basis to support construction of new buildings. Conversion of the remaining parts of campus will proceed in 2012 after the Board of Trustees approves the project. Since most campus buildings are currently configured to receive steam, building-level modifications are also under way. Last fall the first regional heat exchange station went live, serving more than a dozen buildings, including the new Knight Management Center and nearby athletic facilities. Over time, the conversion of buildings and steam distribution pipes to hot water will draw closer to the existing CEF, at which point a full transition to the new Heat Recovery Plant will be complete. To minimize disruption to the university, the conversion process is estimated to last five to seven years.

More Information:

http://sustainable.stanford.edu/climate_action
http://sustainable.stanford.edu/climate_video

Sustainable Choices for Everyone—Cardinal Green Campaigns

Simple energy conservation measures, such as the installation of Smart Strips and appliance timers, provide an opportunity for building occupants to participate in sustainability programs.

Participants in Stanford's Cardinal Green campaigns show their support by wearing t-shirts given to those to take leadership roles or pledge to promote sustainability on campus.

Behavior Matters

Through communication, education, and implementation tools that address the triple bottom line of sustainability—environment, economy, and social equity—Stanford's behavior-based conservation programs showcase the importance of harnessing individual action. During the 2010–2011 academic year, the Office of Sustainability and its partners launched the unprecedented Cardinal Green campaign series. Designed to inspire conservation action by individual members of the community, the campaigns complement efficiency improvement at the infrastructure level and contribute to resource conservation and carbon footprint reduction goals. Through purposeful construction and execution, the campaigns not only engage the campus population in a fun and meaningful way, but also directly impact the university's bottom line.

Six annual campaigns make up the Cardinal Green series and provide an exciting and practical platform for the entire community to become aware of sustainability programs and understand how to take part in the effort. Each

campaign focuses on one key sustainability topic—energy, waste, water, procurement, building-level conservation, and assessment of current practices. Through attractive incentives and attainable goals, the campaigns engage individuals and make sustainability a more tangible part of the Stanford experience.

Measured Campaign Impacts

Impressive results from the first batch of campaign offerings underscore the significant contribution individuals can make towards campus sustainability.

Turn Off For Break!

During the university's two-week winter closure, heating and ventilation systems were shut down in a majority of campus buildings, and employees were asked to take simple actions in their workplaces with the goal of reducing energy consumption. More than $202,000 in operating costs were avoided—a 54% increase from the 2009 winter closure.

We Recycle. Stanford Wins.

Stanford participated in RecycleMania, an annual competition among colleges and universities to promote recycling and waste minimization. Stanford reclaimed second place in the Gorilla Prize for total recycling tonnage, beat Harvard across the board, and scored a personal best in seven of the eight categories.

Tell Your Water Tale.

In preparation for the dry season, Stanford community members were encouraged to identify opportunities for increased landscape irrigation efficiency. Online reports included leaking sprinklers, misdirected sprinklers, soggy lawns, and standing water, vital information for operations crews.

One Less, Save More.

Faculty and staff were challenged to adopt sustainable purchasing habits to minimize negative environmental impact. More than 500 employees pledged to consume less, consolidate orders, and buy reusable or high-recycled-content products. Compared to the same period in 2010, the campaign resulted in 3% fewer orders, a 9.5% reduction in daily order costs, and an increase from 63% to 89% of paper orders with recycled content.

Lasting Partnerships and a Shared Vision

Cardinal Green campaigns rely on campus and community partnerships to achieve success. The Office of Sustainability collaborates with a broad range of campus organizations to develop a win-win solution—communicating the organizations' sustainability-based products and services while simultaneously increasing the visibility of Sustainable Stanford, an inclusive brand that communicates a common purpose and shared responsibility. In the years to come, the campaigns will be fine-tuned for widespread adoption by students, faculty, and staff.

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

New High-Performance Buildings Serve as Hubs for Interdisciplinary Research

Professor Gil Masters stands in front of a solar photovoltaic installation on top of a Knight Management Center building.

The Huang Engineering Center features an outdoor amphitheater and an engineering library filled with daylight.

The flagship Y2E2 building, Stanford's first large-scale high-performance building, continues to achieve significant energy and water savings.

Sustainability in the Built Environment

As stated in the Project Delivery Process (PDP) manual, Stanford is committed to providing a sustainable and inspiring built environment for its students, faculty, staff, and visitors. At Stanford, sustainability refers to ensuring that buildings not only use energy, water, and other natural resources efficiently, but also provide a safe, productive, and educational environment. Stanford recognizes that the building industry has a tremendous impact on the natural environment, both regionally and globally, and the university has the opportunity to take a leadership role in how buildings can be built to conserve resources and inspire users. This requires an integrated process with sustainability as a base criterion in all development stages.

Stanford's PDP manual therefore 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 expected to use 30% less energy than code allows and consume 25% less potable water than comparable campus buildings.

Recent Projects Surpass Existing Guidelines

Many high-performance building projects completed within the last year meet or far exceed energy and water efficiency recommendations outlined in Stanford's guidelines. Across the board, each subsequent high-performance building emphasizes the success of its predecessors and capitalizes on important lessons learned to achieve greater sustainability within the built environment.

- The anchor building of the interdisciplinary **Science and Engineering Quad**, the Yang and Yamazaki Environment and Energy Building (Y2E2), uses 42% less energy than code and 90% less potable water than comparable buildings.
- The Huang Engineering Center and the Center for Nanoscale Science and Engineering, Y2E2's newly occupied counterparts in the Science and Engineering Quad, are expected to achieve 42% and 37% aggregate energy savings, including plug loads, respectively.

The Center for Nanoscale Science and Engineering Building was the third building completed in the new Science and Engineering Quad.

The Lorry I. Lokey Stem Cell Research Building prioritized water conservation within laboratory vivarium areas.

Stanford's recycled water system now serves more than one million square feet of new buildings on campus.

- The **Graduate School of Business's** new Knight Management Center is also expected to use 42% less energy than code, thanks in part to the university's largest solar photovoltaic installation, which provides 12.5% of the center's electricity demand. A portfolio of other high-efficiency sustainability features contributed to the 360,000-square-foot, eight-building complex's impending LEED-NC Platinum certification.
- Both the Lorry I. Lokey Stem Cell Research Building (SIM1) and the Li Ka Shing Center for Learning and Knowledge in the **School of Medicine** prove that highly technical programmatic requirements benefit from high-performance design and construction. SIM1 will save nine million gallons of water annually through the installation of reusable animal cages.
- The **School of Law's** recently opened William H. Neukom Building will use 30% less energy than code.

Core Sustainability Features

In the new high-performance buildings on campus, natural ventilation, sophisticated control systems, and daylight-focused design leverage Stanford's climate and maximize energy-saving opportunities. In addition, Stanford has expanded the service area for its recycled water system, which now sends cooling tower blowdown from the CEF to flush toilets and urinals throughout more than one million square feet of the new high-performance buildings. The gradual proliferation of solar photovoltaic installations deserves special mention as Stanford continues to evaluate the solar potential of the entire campus.

Furthering Stanford's Academic Programs through Sustainable Design and Construction

It is no coincidence that the university's new high-performance buildings house many of Stanford's most cutting-edge, interdisciplinary, and recognized academic programs. In many ways the sustainable design features directly support the mission of these programs. Whether by passive facilitation of collaboration through the inclusion of open space and circulation patterns or by active engagement through its use as a research subject, each new building serves as a teaching tool for the university.

More Information:

http://sustainable.stanford.edu/guidelines

http://sustainable.stanford.edu/green_buildings

http://lbre.stanford.edu/dpm/sites/all/lbre-shared/files/docs_public/PDP_BrochureAugust2010_f.pdf

New Interdisciplinary Research Tackles Sustainability on a Global Scale

Researchers with the Woods Institute for the Environment attached satellite transmitters to leatherback sea turtles in the South Pacific and tracked their movements to better understand the endangered species.

PIE
Precourt Institute for Energy
STANFORD UNIVERSITY

WOODS INSTITUTE
FOR THE ENVIRONMENT
STANFORD UNIVERSITY

A Commitment to Interdisciplinary Research

Stanford's Dean of Research manages several interdisciplinary centers that facilitate collaboration across school boundaries and directly address the Stanford Challenge, including the $250 million Initiative on the Environment and Sustainability. Solutions to the most pressing environmental threats require the integration of scientists, engineers, policy makers, and business and law professionals. Chief among the Stanford organizations working towards interdisciplinary sustainability solutions are the Woods Institute for the Environment and the Precourt Institute for Energy.

Current Leading Research

A review of the major research developments from the past year, presented in more detail through individual stories in subsequent pages, reveals participation by numerous schools and departments, as well as a global focus:

- Obesity and Hunger—India's Dual Health Problem
- Monitoring Groundwater from Space—Using Satellite Data to Monitor Agricultural Groundwater
- Water, Women, and Children's Health

- Program on Food Security and the Environment Launches Food Policy Seminar
- Leatherback Turtles Tell a Story
- BP Oil Spill Commission Adopts Center for Ocean Solutions' Recommendations
- Insights on Aquaculture Pollution
- Reforesting Rural Lands in China Pays Big Dividends
- Stanford Selected to Lead Freshwater Engineering Research Center

Many of the biggest challenges lie in other geographic areas, and those challenges represent some of the most significant opportunities to impact the planet's future. The interdisciplinary nature of Stanford's leading sustainability research moves beyond the environment to address the economic and social equity considerations essential to creating full solutions.

Critical Support

To further research efforts by Stanford faculty, existing grant programs have continued and several new centers have formed to inspire cutting-edge collaboration. In 2010-2011 the Woods Institute for the Environment awarded over $1 million more in Environmental Venture Project grants, bringing the grant total to more than $6.4 million since the program's inception. The TomKat Center for Sustainable Energy awarded $1.2 million to four research groups to explore efficient electricity delivery through "smart grid" systems. A generous gift facilitated creation of the Steyer-Taylor Center for Energy Policy and Finance, which partners Stanford's law and business schools to study and deploy clean energy.

Continued Collaboration and Interaction

Brought together through centers, institutes, and events like the Stanford Food Summit and Connecting the Dots: The Food, Energy, Water, and Climate Nexus, campus researchers continue to embrace interdisciplinary collaboration and remain dedicated to advancing sustainability research. The results are palpable as students across Stanford's schools and departments realize the potency of multidisciplinary solutions to global sustainability challenges.

More Information:

http://woods.stanford.edu

http://pie.stanford.edu

Excellence in Student Projects

Students celebrate the opening of Clothes Loop, a new student-run thrift store in Old Union.

Students demonstrate the Smoothie Bike in White Plaza to promote energy awareness.

Empowering Students to Lead Change

Now entering its fourth year of operation, Stanford's Green Fund continues to prove an invaluable catalyst for student-driven projects to create positive change in campus sustainability. The Green Fund, administered by students with faculty and staff oversight, awards up to $30,000 annually to the student projects best positioned to directly impact Stanford's environmental footprint and serve as test cases for large-scale implementation. Projects must clearly define a measurable outcome, incorporate publicity, education, and outreach, and directly involve students.

Faculty, staff, and students throughout campus have made a strong commitment to sustainability research and implementation. Sustainable Stanford, the campus-wide initiative to steer, connect, support, and streamline all sustainability efforts, fulfills that commitment. Funding student projects through one-time microloans not only is consistent with the university mission of education and research, but also fulfills Sustainable Stanford's vision to lead the university to a more sustainable future through student-led programs and outreach.

Students install rain barrels to harvest rainwater for Columbae.

Students participate in a wind turbine design workshop.

2010-2011 Green Ventures and Results

Final project reports from all prior grant recipients are publicly available online. These reports serve as a database of student efforts and provide interested students the opportunity to expand prior projects to achieve greater results. Requiring grant recipients to catalog both successes and failures has strengthened the applicant pool each year as students learn from their predecessors.

Union Underground: Clothes Loop Thrift Store

Clothes Loop facilitates the exchange of free items within the Stanford community to foster a culture rooted in sustainability, accessibility, and collaboration. Now housed in Union Underground, Clothes Loop operated a free store throughout student move-out to reduce waste and promote reuse.

Green Events Consulting

An initiative of the ASSU Executive housed under the Student Services Division, Green Events Consulting (GEC) encourages voluntary student organizations to make events "green" while educating participants about sustainability. Major GEC-assisted events during spring quarter recorded a combined attendance of more than 3,000, and the team is actively recruiting more consultants.

Columbae Rainwater Harvesting

Following other small-scale rainwater-harvesting projects in student housing, team organizers set out to design and install a larger catchment system at the Columbae row house. A workshop with 25 students successfully installed three 55-gallon drums, which garden managers report work well to supply water to the house's vegetables.

Smoothie Bike

The Smoothie Bike mixes local and organic ingredients into delicious treats via a blender attachment powered by pedaling the bike. The team brings the bike to campus events and local farmers' markets and educates users about energy use, waste, and sustainable food options.

iWater App: Location-Based Water Leakage Reporting Tool

Created to speed response to irrigation malfunctions, the iWater App provides one platform through which Stanford students can report potential problems with a few clicks. A prototype application has been tested on an Internet browser, and transition to smart phones is in progress.

Graduate Student Collective Garden

The Graduate Student Collective Garden renovated and reinvigorated the group's plot at the Stanford Community Farm to form a strong, educational community that provides hands-on gardening experience to graduate students of all experience levels.

Solar Water Heating Installation

The Solar Water Heating Installation Project is responsible for monitoring and analyzing the impact of two solar water heating systems on the rooftops of Adams and Robinson dorms in the Governor's Corner residences. After receiving Green Fund grants in prior years to complete installation and monitoring infrastructure, this year the team created a persuasive dashboard and website display to increase student awareness, educate students about the technology, and change students' energy and water use habits.

Green Roofs at Stanford

Devoted to investigating and quantifying the green roof potential on the Stanford campus, the team researched the design, installation, maintenance, and potential complications of these systems. The team has designed a test roof scheduled for construction and monitoring this fall. Results will help build the case for the feasibility of green roofs on new and existing structures across campus.

A Lasting Impact on Design and Processes

Students have been steadily flexing their implementation muscles through these projects. Many Green Fund projects have established lasting relationships among the students, the Office of Sustainability, and its partner organizations. A number of Green Fund projects each year, such as the Stanford Solar Wind Energy Project and various student garden initiatives, have contributed to large-scale concept design for the entire campus.

From an administrative standpoint, valuable lessons learned from projects over the past three years have shaped the Green Fund committee's preparations for the next round of applications and grant awards. A paid student project manager position was created in 2010–2011 to facilitate student coordination, application assistance, and budget planning. This role helped strengthen measurable project achievements and maintain project momentum throughout the academic year. Based on the lessons from the most successful and impactful projects, the committee will prioritize large-dollar-value projects in 2011–2012, as well as solicit potential project ideas from faculty and staff that interested students could own and execute.

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

Excellence in Teaching and Research

"The faculty and staff in the Woods and Precourt Institutes are dedicated researchers, teachers, and participants in public discourse regarding a sustainable future for both people and the planet. The awards received by this group over the past year bears testament to their great success in not only finding solutions to the major environmental and energy challenges facing us today, but also to their ongoing commitment to training and educating the next generation of leaders in these areas."

Jeff Koseff
William Alden Campbell and Martha Campbell Professor of Civil and Environmental Engineering
Director, Woods Institute for the Environment

In combination, Stanford's seven schools now offer more than 500 environmental and sustainability-related courses. Over 130 faculty members on campus are teaching in this arena, including many of those affiliated with the Woods Institute for the Environment and the Precourt Institute for Energy. Sustainability-related research opportunities abound, and Stanford's faculty consistently achieve top awards, appointments, and recognition for achievement in this field.

Described in more detail in subsequent pages, significant accomplishments by Stanford faculty within the last year include the following:

- **Jeff Koseff** Receives 2011 Eugene L. Grant Award (June 2011)
- **Stephen Palumbi** Receives Benchley Award for Ocean Science (May 2011)
- **Jennifer Burney** Named 2011 National Geographic Emerging Explorer (May 2011)
- **Noah Diffenbaugh, David Lobell,** and **Susanne Moser** Named Google Science Communication Fellows (February 2011)
- **Jon Krosnick** Elected AAAS Fellow (January 2011)

"Energy is the lifeblood of modern societies, and it is a primary way we humans interact with our environment. And just as it is woven into the fabric of our lives, it is deeply entwined in research and teaching at Stanford. Our research ranges from improved photovoltaics, to dramatically more efficient engines, to better batteries, to the behavior changes required to make our energy use more efficient, and much more. Through the Precourt Institute for Energy and the many departments and programs engaged in energy research and teaching, Stanford students and faculty are engaged in inventing the energy systems of the future, and training the leaders who will make those changes happen."

Lynn Orr
Keleen and Carlton Beal Professor in Petroleum Engineering, Energy Resources Engineering Department
Director, Precourt Institute for Energy

- **Scott Rozelle** and Gary **Schoolnik Receive** Global Underdevelopment Action Grants (December 2010)
- **Stephen Palumbi**, Colleagues Receive Grant to Study Effects of Ocean Acidification (November 2010)
- Senior Fellow **Mark Jacobson** Appointed to Federal Energy Advisory Committee (November 2010)
- **Gretchen Daily** and **Terry Root** Named California Academy of Sciences Fellows (October 2010)
- **Terry Root** Receives Science Conservation Award from Defenders of Wildlife (September 2010)
- **Gretchen Daily** Receives 2010 Heinz Award (September 2010)
- **Gretchen Daily** Wins Midori Prize for Biodiversity (September 2010)

Faculty recognition and awards confirm Stanford as a global leader in sustainability research and teaching. National and international accolades position Stanford to guide the future of sustainability in concert with peer organizations, as well as strengthening the university's offerings to students, the next generation of difference makers.

More Information:
http://woods.stanford.edu
http://pie.stanford.edu
http://pangea.stanford.edu/

Sustainable Stanford 2010-2011

Metrics and Trends

OPERATIONAL MILESTONES

The Initiative on the Environment and Sustainability represents a component of the Stanford Challenge, a university-wide campaign and academic commitment to address the world's most challenging problems through interdisciplinary study, research, and collaboration. All seven schools at Stanford now offer a wide range of environmental and sustainability-related courses and research opportunities, and over 130 faculty members on campus are teaching over 500 courses in this arena, including those affiliated with the Woods Institute for the Environment and the Precourt Institute for Energy.

The Department of Sustainability and Energy Management (SEM) houses the operational counterpart to Stanford's academic endeavor. SEM leads initiatives in campus infrastructure and programs in energy and climate, water, green buildings, and transportation, and it partners with Stanford Dining and Peninsula Sanitary Services, Inc. (PSSI), on food and zero-waste programs. Below is a quick summary of the predominant trends in operational sustainability at Stanford. Detailed discussions and metrics for each area are provided in the pages that follow.

Operational Sustainability Metrics Summary	Trend	Baseline Year
Total Energy Use	↑ 10%	2000
Total Energy Intensity	↓ 7%	2000
GHG Emissions	↑ 5%	2007*
Landfilled Waste	↓ 30%	2000
Drive-Alone Rate	↓ 26%	2002*
Domestic Water Use	↓ 22%	2000
Domestic Water Intensity	↓ 34%	2000

*Years other than 2000 denote formal program start dates.

Climate Action

The university's long-range Energy and Climate Plan, released in October 2009, proposes an adept balance among performance standards for new construction projects, existing building efficiency programs, and a modernized energy supply system to reduce Stanford's carbon footprint 20% below 1990 levels by 2020 and 50% below 1990 levels by 2050. Initial implementation is already under way, as evidenced by the following key actions:

- American and European engineering firms with expertise in heat recovery and conversion of steam systems to hot-water systems were hired, and detailed conceptual design for the new energy supply scheme is now 50% complete.
- Stanford developed an in-house Central Energy Facility energy-modeling program to support design of the new heat recovery plant and model its operation in the most economic and energy-efficient manner, with a goal of significantly minimizing impact to the electrical grid.
- Utilities divisions installed and tested a ground-source heat exchange well and prepared an engineering analysis of its potential for inclusion in the new heat recovery scheme.
- Stanford's first regional heat exchange station went online and now serves about a dozen nearby structures. The station converts steam piped from the cogeneration plant to heating hot water and distributes that directly to buildings. As implementation of the Energy and Climate Plan progresses, a network of these stations will open across campus and building-level conversions will continue, setting the stage for the full transition from a steam to a hot-water system.
- In 2009, for the fourth consecutive year, Stanford completed and certified its public inventory of Scope I and Scope II CO_2 emissions through the California Climate Action Registry (CCAR). Each year the campus also prepares inventories of its Scope III emissions and emissions attributed to steam and chilled-water deliveries to Stanford Hospital and Clinics. For the first time in 2009, Stanford reported emissions of the five other greenhouse gases (GHGs) identified in the Kyoto Protocol (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride). Together they comprise one-tenth of one percent of the university's total GHG emissions.
- Stanford transitioned to the Climate Registry (TCR) for its 2010 emissions inventory, and third-party verification under the new protocol is currently in progress.

Energy Efficiency

Organizational changes were made in 2010 to consolidate the energy management programs and staff previously spread among Zone Management, Buildings & Grounds Maintenance, and Utilities into a new, integrated division called Facilities Energy Management (FEM). With a singular focus on skillfully managing building energy demand, FEM ensures operational efficiency in existing facilities and incorporation of best practices into all new buildings. Completion of major capital energy efficiency retrofits to existing buildings, coupled with aggressive energy conservation programs, further increased campus physical plant efficiency and reduced operating costs:

- The Whole Building Retrofit Program continued to address the 24 campus buildings with the largest energy consumption. Eleven projects have been completed, three are in pre-construction, and four are in Phase I or Phase II design. The remaining six will be addressed in 2012.
- The Energy Retrofit Program has delivered an estimated cumulative savings of over 240 million kWh of electricity since it began in 1993, roughly equivalent to 15 months of the university's current use.
- The Sustainable IT program continued to expand and achieve success with data center efficiency programs and end-user computer operation. A desktop power management system, first deployed in 2007 and configured to turn off monitors and put computers to sleep when not in use, is now required for network registration and appears on 10,000 machines, an estimated 65% campus-wide adoption rate.
- Participation in the "Cash for Clunkers" Room Temperature Biological Sample Storage Program exceeded expectations for freezer retirement and led to the coordination of a successful research symposium on the benefits of room-temperature storage.
- The two-week winter break continued to be an opportunity to maximize energy savings and reduce operating expenses. The 2010–2011 curtailment effort allowed Stanford to avoid $202,000 in utility charges. The cumulative net energy cost savings since 2001 total $2.2 million.

Water Conservation

The Energy and Climate Plan's proposed infrastructural changes will reduce the water evaporated via cooling towers by 70%, thereby reducing the university's total domestic water consumption by 18%. In addition, Stanford advanced sustainability in campus water use by improving campus surface water supplies, developing innovative alternative water supplies, and continuing water conservation efforts in campus buildings:

- Stanford reduced domestic water use on campus 22% in FY2011 compared with FY2000, despite adding more than one million gross square feet (GSF) to the building portfolio. The number of water conservation measures has increased from the 14 identified in the 2003 Water Conservation Master Plan to more than 20 being employed today.
- Stanford expanded the service area for its reclaimed-water facility by 870,000 GSF. Cooling tower blowdown at the Central Energy Facility provides water for toilet flushing in the Science and Engineering Quad and GSB complexes, as well as recently opened School of Medicine buildings.
- Water conservation efforts continued through replacement of old bathroom fixtures with modern low-flow units. A new 1/8-liter-per-flush urinal was piloted with great success as an alternative to waterless urinals. Water conservation pilot projects now under way include ultra-low-flow shower heads in athletic facilities, soil moisture sensors at the golf course and in community parks on campus, and ultra-low-flow pre-rinse stations in food service kitchens (all pre-rinse stations already have significantly lower flow rates than the maximum permitted by code).
- Turf reduction programs expanded to include replacement of 100,000 GSF of football practice field with synthetic field turf, elimination of more than 35% of turf in graduate student housing areas, and a rebate program for faculty/staff housing that offered $75–$150 for each 100 square feet of turf eliminated. In addition, more than 80% of the campus landscape now receives irrigation from nonpotable sources.
- The Water Sustainability Working Team is formalizing a long-range sustainability plan that establishes a definition, goals, and strategies for long-term water sustainability at Stanford, setting the course for water resource preservation, water budgeting, water conservation and demand reduction, water supplies and infrastructure master planning, and water management education. These measures are being considered in the broader context of the total sustainability of Stanford's and the region's water and energy resources, and the local hydrologic environment and corresponding ecosystems dependent on those resources.

Green Buildings

Advancements in green building design, construction, and operation continue to assure that Stanford delivers and maintains high-performing new facilities in accordance with its Guidelines for Sustainable Buildings:

- The new GSB Knight Management Center fully opened in April 2011, and a LEED-NC Platinum certification is expected in the fall. The 360,000-square-foot development meets higher energy and water standards than those outlined in Stanford's Guidelines for Sustainable Buildings.
- The second and third buildings in the Science and Engineering Quad complex opened, and both are expected to perform even better than their predecessor, the Jerry Yang and Akiko Yamazaki Environment and Energy Building (Y2E2), which currently uses 42% less energy and consumes 90% less potable water than permitted by code.
- Two recently completed School of Medicine buildings, the Li Ka Shing Center for Learning and Knowledge and the Lorry I. Lokey Stem Cell Research Building, prove that highly technical programmatic requirements can benefit from high-performance design and construction, and serve as national models for successful university laboratories.
- Advanced space utilization programs, including strategic partnerships with vendors of sustainable office equipment, have reclaimed 5% to 10% of previously wasted existing space. Fees are now assessed to departments when space is not wholly utilized per guidelines.
- Design development is nearing completion for the new 1.1 million–GSF Stanford Hospital and Lucile Packard Children's Hospital. The projects are expected to achieve LEED-NC Silver equivalency. Contractors have been selected, initial construction is under way, and integrated project delivery is being employed throughout the remainder of each project.

Transportation

Stanford continued its successful Transportation Demand Management (TDM) program, promoting alternative transportation for those who commute to campus, and gradually transitioning the campus fleet to more sustainable vehicles:

- A draft long-term Sustainable Transportation Master Plan has been prepared and is currently undergoing internal 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 offset programs.
- In 2011, the employee drive-alone rate dropped to 46%, compared to 72% in 2002 at the inception of the formal TDM program. Commute-related emissions are steadily below 1990 levels.
- Marguerite shuttle bus ridership continued to climb. Passenger numbers rose again in 2010, from 1,416,508 to 1,447,616. Major changes to the shuttle routes were implemented to conserve fuel, reduce emissions, and reduce operating costs without sacrificing service.
- Nearly one-third of Stanford's 1,049 fleet vehicles are electric, and the number of hybrid vehicles increases each year. The fleet also includes one experimental solar vehicle. Stanford's Marguerite shuttle fleet includes 2 diesel-electric hybrid buses and 40 biodiesel buses.
- Designated the nation's first and only Platinum-Level Bicycle Friendly University in 2011, Stanford expanded its bike program to accommodate the estimated 13,000 bikes on campus each day. The expansion included the addition of new bicycle safety repair stands that offer free tools to enable bicyclists to make minor repairs and pump up tires, encouraging the campus community to keep bikes in good working condition.

Waste Minimization

Stanford expanded its waste minimization efforts by outfitting additional public trash cans with recycling receptacles, including newly designed multipurpose furnishings and even, in a pilot test, solar-powered recycling compactors. Stanford continued progressing towards the ultimate vision of zero waste:

- All recycling, composting, and trash bins were outfitted with updated instructional signage. Designed with the support of a Green Fund grant, the revamped labels use modern pictures and clear wording to help users identify appropriate content for each receptacle.
- New sustainability guidelines intended to minimize waste at special events such as Commencement and Reunion/Homecoming were developed and disseminated campus-wide. Special efforts to "green" Commencement were made through a collaborative effort by many departments and highlighted on Stanford's main home page.

STANFORD UNIVERSITY SUSTAINABILITY METRICS —

Sustainability Area	Metrics	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
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	206.2
	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	klbs (in millions)	798.7	847.7	860.5	865.4	878.8	904.4	876.1	858.4	883.5	825.7	848.2	848.2
	lbs/usf	90.6	96.9	98.5	99.1	97.9	99.9	96.2	92.8	95.0	85.8	83.3	83.3
Chilled Water	ton-hr (in millions)	48.0	48.0	49.8	54.3	59.9	55.4	53.5	56.6	56.3	56.3	52.8	52.8
	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	5.9
Greenhouse Gas Emissions													
(publicly reported[2])	Metrics tons of CO_2	n/a	n/a	n/a	n/a	n/a	n/a	168,400	182,900	180,700	182,400	191,300 [3]	,300 [3]
Waste minimization													
Total Waste Reduction & Recycling	tons	11,276	11,300	11,587	11,047	13,629	12,668	14,732	13,193	14,686	15,251	14,261	4,261
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	8,104
Total Discards	tons	22,771	21,494	22,016	20,580	22,891	21,762	24,290	22,014	22,866	23,635	22,369	2,369
Diversion Rate		50%	53%	53%	54%	60%	58%	61%	60%	64%	65%	64%	64%
Transportation													
Commuter Drive-Alone Rate (employees only)		n/a	n/a	72%	65%	63%	58%	54%	52%	51%	48%	48%	48%
Commuter Drive-Alone Rate (all off campus commuters)		n/a	n/a	n/a	60%	59%	54%	50%	46%	46%	43%	42%	42%
		2000/01	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**	**2010/11**	**010/11**
Water													
Domestic	gal (in millions)	997.2	862.8	840.1	921.1	843.1	811.8	832.4	841.8	778.6	780.8	774.7	774.7
	gal/usf	96.1	81.5	77.7	85.0	76.6	73.1	74.4	74.8	69.3	67.4	63.8	63.8
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	391.3

Note:

1. In 2010 Stanford transitioned to usable square footage (USF) in lieu of gross square footage (GSF) since tracked campus GSF data now includes attic areas and other spaces not normally used. Thus, USF is a more accurate reflection of service area 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 exclude parking structures.
2. Emissions for 2006 – 2009 verified per the California Climate Action Registry General Reporting Protocol, including de minimus emissions.
3. Emissions for 2010 per the Climate Registry General Reporting Protocol, including simplified estimation (de minimus equivalent) emissions, verification pending.

- In the RecycleMania 2011 contest, Stanford scored in the top 20 in six of the eight categories: per capita (16), total tonnage (2), paper (11), cardboard (12), bottles and cans (16), and food waste (17).
- An expanded composting service now includes all dining halls and half of the campus eateries, as well as many student row houses and offices. Student groups coordinated a zero-waste pilot project at three campus cafés, and new online guides provide step-by-step instructions for any department to establish a voluntary composting program.
- Regular waste audits continued to provide valuable information to the Stanford community. More than 20% of the items Stanford sends to the landfill are recyclable bottles, cans, and paper, a fact that highlights a significant educational opportunity for the campus.

Food & Dining Services

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 continued to create a positive impact via education, collaboration, and the pursuit of culinary excellence:

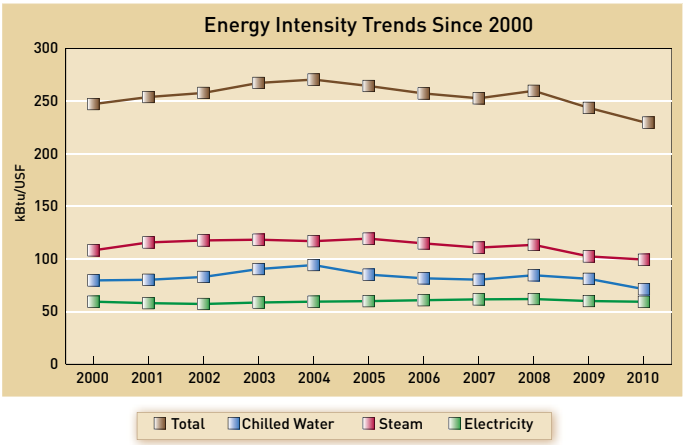
- Stanford Dining and Stanford Hospitality & Auxiliaries published Sustainability: A Way of Life, a report highlighting the Sustainable Food Program's objectives, achievements, and best practices.
- The daylong inaugural Food Summit brought together experts from all seven schools and the local community to address global food-related problems that require interdisciplinary solutions.
- Programs to reduce the waste generated by Stanford's food services continued to thrive. These included expanding Stanford Dining's trayless dining initiative to all dining halls, giving reusable water bottles to every incoming freshman, and expanding post-consumer composting to all Stanford Hospitality cafés. Together with the student-run program SPOON, R&DE diverted over 14,000 pounds of usable food from campus dining halls and cafés to a local shelter.
- Major purchasing accomplishments by Stanford Dining include 100% antibiotic- and hormone-free milk from local dairies, 100% locally raised, grass-fed beef patties, 100% certified Fair Trade coffee, 100% cage-free eggs, and 100% USDA-certified organic nonfat milk.

- In collaboration with students, staff, and faculty, the Sustainable Food Program played a significant role in providing education in sustainable food systems through frequent lectures, class projects, and multidisciplinary research projects.

TRENDS

Since 2000, Stanford has maintained detailed performance records in the key operational areas of energy, GHG emissions, transportation, waste, and water. The trends are evaluated and presented on an intensity basis, and they reveal that in all areas the campus has either maintained or lowered consumption per usable square foot (USF), despite general growth and the addition of nearly one million square feet of high-intensity research laboratory space. Analyzing performance trends allows facilities managers to quantify the impact of conservation programs and tailor future initiatives to meet specific campus needs.

Energy Intensity



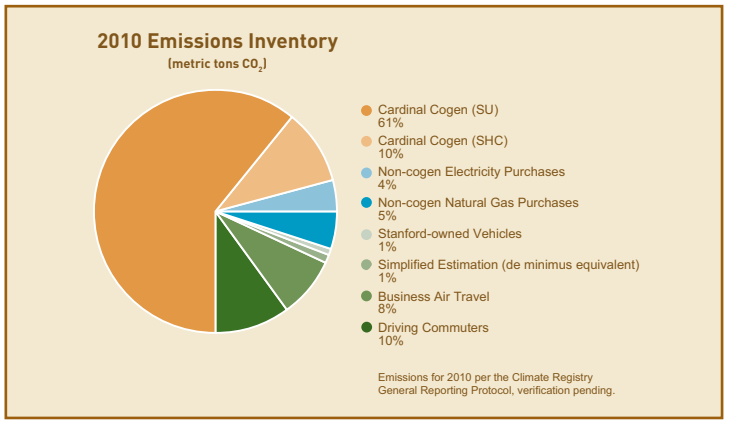
- Overall energy intensity (kBtu/USF) is now less than it was in 2000, despite the addition of nearly one million USF of new energy-intensive laboratories. This suggests the suite of energy-saving programs targeting large-scale building retrofits; small-scale retrofits; heating, ventilation, and air-conditioning (HVAC) controls; and new construction standards are reducing the rate of increase in energy intensity. For example, the Whole Building Retrofit Program, which addresses conservation in the 24 most energy-intensive buildings on campus, is expected to save $4.2 million annually and reduce total energy use in these buildings by 28%.

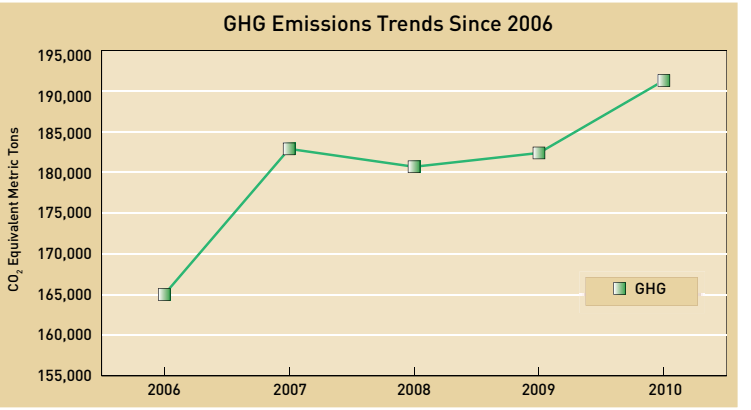
- Electricity consumption per USF has remained relatively constant over time even as energy-intensive research functions and computing needs have grown.
- Steam consumption per USF has remained relatively flat over time, with a notable decrease starting in 2009. The steam system underwent no major upgrades during this time. Typically, increased electricity intensity decreases the need for building heating, and the steam consumption trend can be attributed to that increase and/or weather variations during the last decade.
- Chilled-water consumption per USF increased after 2000 but is now trending downward. Typically, increased electricity intensity adds to building cooling needs and may offset energy retrofit projects, but annual weather variations can significantly affect chilled-water consumption.

Greenhouse Gas Emissions

The CCAR General Reporting Protocol requires filing Scope I and II emissions with independent third-party verification, and encourages filing Scope III emissions. Stanford joined the CCAR in 2006 and used this protocol to prepare and file its GHG emissions inventories through 2009. In 2010 the university transitioned to the Climate Registry and followed TCR General Reporting Protocols.

Stanford's GHG emissions increased from 2006 to 2007 due to maintenance operations at the Central Energy Facility but dropped slightly in 2008, with emissions within specific categories remaining largely the same. Emissions in 2009 were similar to those in 2007, excluding other Kyoto protocol gases, suggesting that energy conservation programs helped stabilize emissions.

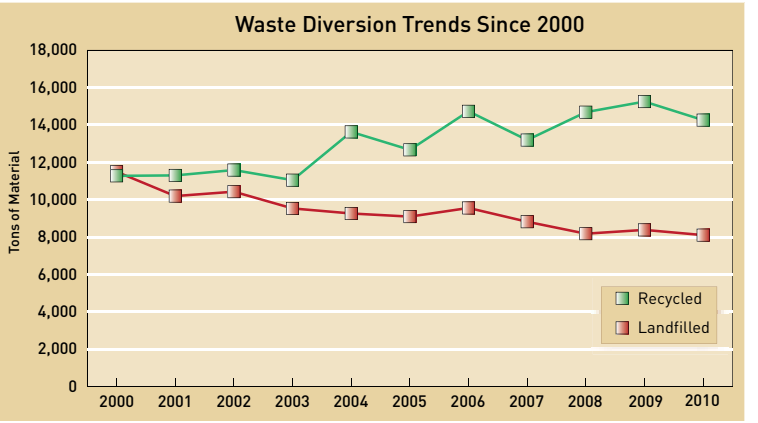




In 2010 emissions increased, a reflection of campus growth with increased research building intensity. Differences between CCAR and TCR protocols with respect to emissions from leased spaces also explain part of the increase.

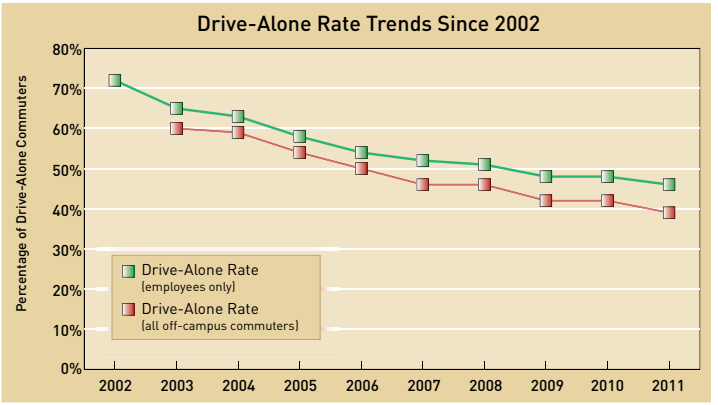
As part of the Energy and Climate Plan, the campus proposes to replace the current cogeneration plant with an innovative heat recovery facility that will capture low-grade waste heat from the building chilled-water loop and convert it to usable heat. Made possible by the existing district heating and cooling system that supports the university's largest buildings, the process will result in greater central plant energy efficiency and corresponding GHG reductions. The proposal dramatically reduces the need for fossil fuel electricity generation, significantly reduces the heat released into the atmosphere, and reduces campus water use. The heat recovery scheme will move Stanford into a new energy era with significantly lower costs, GHG emissions, and water use.

Waste Diversion Rate



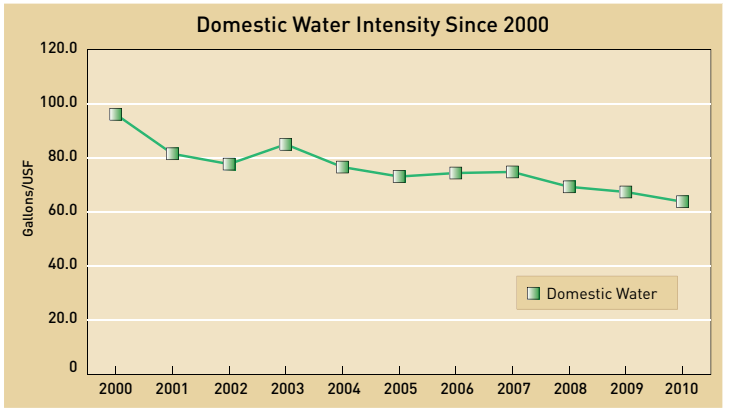
The waste reduction and recycling program serves all academic and athletic areas, student housing and dining, faculty and staff housing, the Stanford hospitals, SLAC National Accelerator Laboratory, and construction sites. The program has increased Stanford's diversion rate (waste diverted from the landfill, as a percentage of total waste tonnage) from 30% in 1994 to an all-time high of 65% in 2009. Stanford's immediate aim is to achieve 75% diversion as an interim step towards the ultimate goal of zero waste.

Drive-Alone Rate



More than 2,000 Stanford commuters switched to alternative transportation between 2002 and 2011. The TDM program has resulted in a drop in Stanford's employee drive-alone rate from 72% in 2002 to 46% today. Emissions from commutes remain below 1990 levels.

Domestic Water Intensity



Stanford's water conservation, reuse, and recycling program has reduced domestic water consumption by 22% since 2000, despite significant growth in the facilities served. Domestic water intensity is now 34% less than it was in 2000. In Stanford dining facilities, replacing standard dishwashers with trough conveyers that constantly recycle water cut water use by 51%, about 142 gallons per hour.

Replacing once-through cooling systems in laboratories with circulation systems that reuse the cold water has saved about 174,000 gallons per day. The university completed 50 water efficiency retrofit projects from 2001 through 2008 and increased the number of water conservation measures from 14 identified in 2003 to more than 20 in standard use today.

PROGRAMMATIC MILESTONES

The Office of Sustainability connects campus organizations and entities, and works collaboratively with them to steer sustainability initiatives and reach milestones. The office works on long-range sustainability analysis and planning, assessment and reporting, sustainability governance strategy, conservation behavior and training, communication and outreach, and academic integration. Complementing operational efficiency measures undertaken by campus facilities managers, distinct and education-oriented programmatic initiatives make sustainability more actionable and visible throughout the campus community.

Assessment and Reporting

Collecting and analyzing data from sustainability initiatives on campus facilitates greater understanding of the breadth and depth of sustainability offerings at Stanford, and also provides a forum for cataloging and disseminating best practices. The study of collected data further informs both future direction and goals for Stanford's programs. Based on the strong tradition of internal reporting and proven program success, national evaluating organizations continue to recognize Stanford as a leader in sustainability programs and a benchmark for other institutions:

- For the third consecutive time, and the fourth time in the last five years, Stanford received an A- grade on the Sustainable Endowments Institute's College Sustainability Report Card. Of 322 schools surveyed, Stanford is one of 52 Overall College Sustainability Leaders. Stanford earned straight A grades in administration, climate change and energy, food and recycling, green building, student involvement, transportation, investment priorities,

and shareholder engagement. The A in climate change and energy represents a letter-grade improvement over the B earned in that category last year and recognizes the formalization of the university's Energy and Climate Plan, among other energy conservation programs.

- In August 2011 Sierra magazine rated Stanford fifth for the second consecutive year in the "Cool Schools" Ranking. Stanford improved its scores on Food and Purchasing questions, and maintained last year's perfect or near-perfect scores on Academics, Waste, and Other Programs/ Initiatives.

Interdepartmental Collaboration and Governance

Building 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 fundamental missions of Stanford's sustainability program. Diverse and interdisciplinary organizations such as the Sustainability Working Group and Sustainability Working Teams (SWTs), as well as projects such as the GHG task force, conference and event participation, and regular sharing of information, allowed Sustainable Stanford to increase collaboration with the larger Stanford community. Initiatives ranged from organization of and participation in lectures, tours, panels, and conferences to direct work on campus sustainability plans through the SWTs. Sustainable Stanford also worked with the President's Office, Event and Labor Services, R&DE, and others to promote green catering and services for Commencement, Homecoming, and other marquee events.

Behavioral-Based Conservation Programs

Acknowledging that individual awareness and actions conserve resources, lower utility bills, and contribute to an environmentally sustainable campus experience, consistent with the university's commitment to sustainability, Sustainable Stanford offers a range of programs to engage the community:

- Campus-wide Cardinal Green conservation campaigns aim to increase institutional awareness regarding programs to reduce resource consumption. Each of the six annual campaigns focuses on a single topic area and invites active community participation through educational webinars, online pledges, and result-based incentives. The inaugural campaigns offered during the 2010–2011 academic year exceeded performance goals and gained momentum through targeted promotion to the most relevant campus groups for each topic area.

- 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, an audit walk-through, a customized "green action menu," and comprehensive building evaluation criteria. It incorporates best practices observed during the 14 pilots conducted since 2009 as well as online resources such as "How To Guides" and rebates for installation of small energy-saving devices like Smart Strips and appliance timers. The pilots resulted in a sustained reduction of up to 20% in office building electricity use with an average payback of just nine months.

Campus Communications

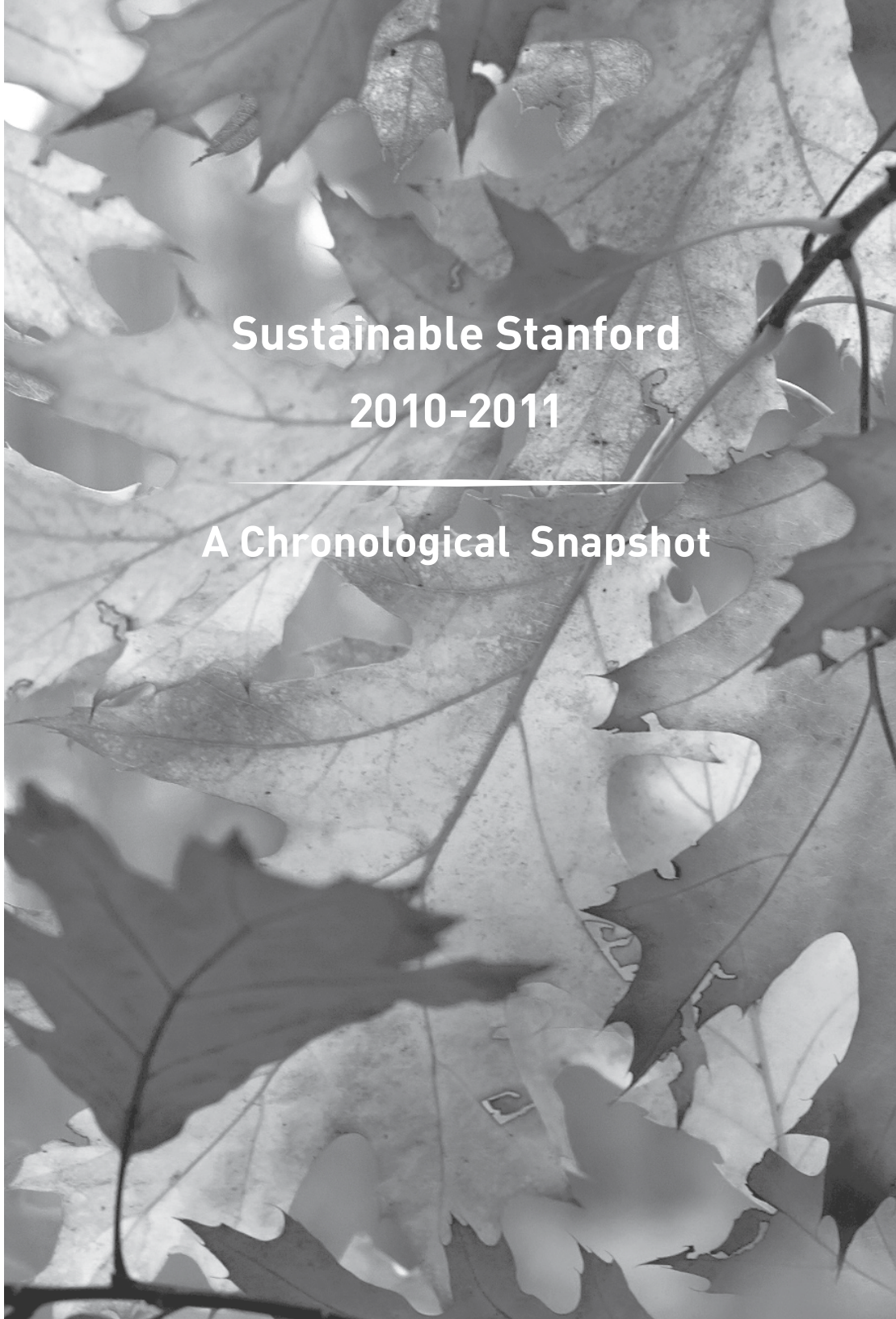
The Sustainable Stanford website continues to serve as a campus and community resource for news on campus sustainability efforts and accomplishments. Cardinal Green, the Sustainable Stanford quarterly newsletter, provides an ongoing forum for sustainability teams and topics, and promotes sustainability activities throughout the community. The department has engaged in on- and off-campus community outreach and participated in university-wide academic and administrative programs and events related to sustainability. For example, it has:

- Hosted student Town Hall meetings to discuss campus-wide sustainability initiatives
- Presented six sustainability topics at the 2010 Association for the Advancement of Sustainability in Higher Education (AASHE) Conference
- Presented six sustainability topics at the 2011 California Higher Education Sustainability Conference (CHESC)
- Presented at numerous faculty- and student-led classes related to the environment and sustainability
- Presented at the Silicon Valley Energy Summit, cosponsored by the Silicon Valley Leadership Group and the Precourt Institute for Energy
- Offered sustainability tours at the annual Walk the Farm, Reunion/ Homecoming, and Parent's Weekend events
- Published "Greening Events at Stanford" in partnership with all relevant event-organizing entities on campus
- Presented at the U.S. Energy Association
- Created a climate action video to explain the Energy and Climate Plan

Academic Integration and Student Training

Formal educational student 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 Stanford's students:

- Sustainable Stanford updated the "Student's Guide to Sustainable Living at Stanford" and distributed it electronically to the incoming class of 2015.
- The Office of Sustainability collaborated with the Woods Institute for the Environment to offer Civil and Environmental Engineering / Earth Systems 109 again in winter quarter of the 2010–2011 academic year. The first overarching local sustainability course offered by Stanford, CEE/ES 109 aims to engage students in employing sustainability within an institution. It features numerous Stanford faculty and staff lecturing on topics that include energy efficiency, water use, waste management, sustainable food, and transportation systems. The final class project requires students to complete building-level audits and create recommendations for behavior-based program implementation within a strategically selected building. Class participants have the opportunity to capitalize on the final project momentum and join the Office of Sustainability as interns to help transform their proposals into action. CEE/ES 109 is now an annual offering.
- The Stanford Student Green Fund continued to thrive in its third year of operation. The committee, now led by a paid student intern, received 19 applications requesting a total of a little over $100,000. The committee chose projects based on their potential to achieve intended goals as well as enable students to actively contribute to campus sustainability. Grants totaling close to $30,000 were awarded to projects addressing waste management signage, solar hot-water heaters, real-time electricity monitoring in dorms, and rainwater capture for composting support during the dry months. The final reports from each year are available online.



Green Fund Recipients Maintain Campus Gardens to Ensure Fresh Produce

The garden beds at the Hammarskjold, Synergy, Columbae, and Enchanted Broccoli Forest student houses yielded a small bounty of summer produce, thanks in part to two students hired to tend the residential gardens while school was out of session. Past summers had seen the triumph of weeds throughout the gardens, requiring student garden managers to spend a good part of fall quarter rejuvenating the beds rather than harvesting produce. Supported by the Green Fund, and in partnership with Student Housing, the Campus Garden Initiative (CGI) hired two students to maintain the gardens throughout the summer. CGI is a student-run cooperative network that funnels resources to gardening projects across campus, makes tools and seeds available to university-hired student garden managers, and acts as an intermediary between residential gardeners and Student Housing. During the academic year, with CGI support, students care for gardens adjacent to their houses and enjoy the local produce now available throughout the year.

More Information:

http://stanfordgarden.synthasite.com/

http://sustainable.stanford.edu/green_fund

"How To Guides" Go Live: Online Resource Answers Common Conservation Questions

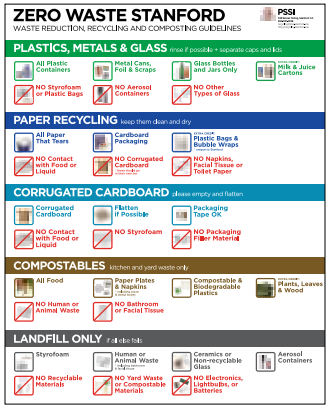
The Office of Sustainability launched a series of "How To Guides" throughout the fall to serve as practical complements to the Building Level Sustainability Program (BLSP). The subject matter for each of the available guides reflects the questions most frequently asked by building occupants during BLSP pilot projects. Members of the Stanford community can now learn about establishing office composting, creating a shared bike fleet, applying for Energy Retrofit Project funding, eating more sustainably, and reducing energy consumption from desktop computing. As BLSP rollout expands across campus, the "How To Guides" will continue to be a valuable resource for Building Champions and Green Teams eager to implement common conservation measures effectively.

More Information:

http://sustainable.stanford.edu/publications_and_reports

http://sustainable.stanford.edu/building_level_sustainability

New User-Friendly Labels Installed on Waste and Recycling Bins across Campus



Throughout fall quarter, all recycling, composting, and trash bins on campus were outfitted with updated instructional signage designed with the support of a Green Fund grant. Based on consultation with PSSI / Stanford Recycling Center as well as extensive observation and focus group testing, the revamped labels use modern pictures and clear wording to help users identify appropriate content for each receptacle. To further educate the community on the new signage and corresponding new elements of Stanford's recycling program, staff offered informational booths throughout New Student Orientation and other kickoff activities for fall quarter.

More Information:

http://bgm.stanford.edu/home_pssi_main

http://bgm.stanford.edu/pssi_flyers

Sustainability Presence Strengthened at New Student Orientation: Record Number of Pledges

An increased presence at numerous fairs during New Student Orientation (NSO) provided an opportunity for incoming students and their families to interface with Sustainable Stanford's programs. Student interest was strong throughout the week's major events. Many students requested informational materials and were eager to discuss Stanford's Energy and Climate Plan. Freshmen and their parents frequently mentioned the Students' Guide to Sustainable Living at Stanford, distributed electronically to all incoming students in August.

The sustainability momentum continued into residential life, with a record 554 students signing the Green Living Pledge, a student initiative spearheaded by the Green Living Council. Students taking the pledge commit to simple everyday actions that reduce energy and water consumption as well as greenhouse gas emissions. Sustainable Stanford's participation in NSO, publication of the "Students' Guide to Sustainable Living at Stanford," and partnership in promoting the Green Living Pledge are now standard offerings to start each academic year.

More Information:

http://glc.stanford.edu/pledge

http://sustainable.stanford.edu/students

Stanford Dining Commits to 100% Cage-Free Eggs

Stanford Dining, a division of Residential & Dining Enterprises (R&DE), began serving 100% cage-free eggs in every dining hall and the executive dining program starting in the 2010–2011 academic year. This achievement was recognized by the Humane Society of the United States. Cage-free hens generally have two to three times more space per bird than caged hens, but Wilcox Family Farms, Stanford's partner and egg supplier, goes beyond cage-free. Located in Washington State, it is the only poultry farm certified by the Food Alliance. It is also certified by Oregon Tilth, Humane Farm Animal Care, and Salmon Safe. Wilcox Family Farms uses a three-level European aviary system with perches.

In July 2010, then Governor Arnold Schwarzenegger signed AB 1437, which requires that all whole eggs sold in California by 2015 come from hens able to stand up, fully extend their limbs, lie down, and spread their wings without touching each other or the sides of their enclosure. Through the partnership with Wilcox Family Farms, Stanford's switch to cage-free eggs this year preempts the AB 1437 deadline and maintains the Sustainable Food Program's position___ as a thought leader in the industry.

More Information:

http://www.wilcoxfarms.com/

http://www.stanford.edu/dept/rde/dining/sustainability

New Graduate School of Business Named "Green Project of the Year"

The *Silicon Valley Business Journal* selected the new Knight Management Center, home to the Graduate School of Business, as the "Green Project of the Year" in the private sector. The award recognizes the 360,000-square-foot project for its deep commitment to sustainability, from the photovoltaic panels that will supply 12.5% of the center's annual electricity needs to the 80% reduction in water use compared to similar campus buildings. The project is currently on track to receive a LEED-NC Platinum Certification from the United States Green Building Council in late 2011 after construction completion and full occupancy. The Knight Management Center will be the first LEED-certified project on the Stanford campus.

More Information:

www.usgbc.org/

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

Student Group Wins P3 Grant from the EPA for Design of Renewable Energy Teaching Tools

Members of the Stanford Solar and Wind Energy Project (SWEP) student group joined forces with teachers in the Soledad Unified School District starting in the 2010–2011 academic year to bring low-cost, interactive teaching materials with renewable energy lessons to middle and high school students. The U.S. Environmental Protection Agency awarded SWEP a People, Prosperity, and the Planet (P3) Grant in April 2010 to develop innovative educational materials focused on teaching California science standards through examples drawn from renewable energy systems. The project is called "Tape & Scissors" because the kits, developed by SWEP and unveiled in time for the new school year, are all-inclusive—teachers only need to provide tape and scissors. The kits represent a pioneering educational strategy that uses simple tools to put the building blocks of leading-edge technology within the grasp of students who will benefit from and work with it in the future. Project leaders presented in Washington, D.C., and were awarded a second round of funding, which ensures continued opportunities for SWEP to impact the science education of local students.

More Information:

http://inversion.stanford.edu/swep/drupal/?q=node/23

http://www.epa.gov/P3/

Executive Symposium Tackles the Century's Major Challenge: Creating a Sustainable Energy System

Leaders from academia, business, government, and journalism emphasized the urgent need for sustainable energy, and researchers shared their work on possible solutions, at the Global Climate and Energy Project's sixth annual research symposium. As *New York Times* columnist and Pulitzer Prize winner Thomas Friedman said during his keynote address, "If we don't bring sustainable value to the market and Mother Nature, we are going to be more unfree than had we not won the cold war." Other key speakers included Dr. Xu Kuangdi, honorary chairman of the Chinese Academy of Engineering and former mayor of Shanghai, and Kristina Johnson, U.S. under secretary for energy and a Stanford alumna. Researchers from Stanford and other universities spotlighted the latest technological research and innovation in solar energy, biofuels, energy storage, the electrical grid, and advanced carbon-based energy systems. In addition, executives from Google, Cisco, and C3 discussed how information technology can help build sustainable energy systems.

More Information:
http://gcep.stanford.edu/events/symposium/index.html

New ChemTracker System Reduces Campus Chemical Waste

Environmental Health & Safety (EH&S) developed the ChemTracker online inventory system for laboratories at Stanford. Maintaining an accurate and up-to-date chemical inventory is a regulatory and university requirement; it also reduces chemical waste by minimizing unnecessary purchases of material already in stock or available via the surplus chemical inventory. Upon request, EH&S can search the campus-wide inventory and help facilitate the sharing of chemicals. A researcher who only requires a small quantity of a particular material can more easily borrow from another campus laboratory, rather than placing a new order. Many departments have designated one local person to view the department's entire inventory to maximize the identification of chemical sharing opportunities.

More Information:
http://ehs.stanford.edu

Sustainable Stanford Releases Energy and Climate Plan Educational Video

In response to growing enthusiasm for the innovative solutions presented in Stanford's Energy and Climate Plan, Sustainable Stanford produced and released a video overview of the plan's key components. In addition to a historical perspective on Stanford's environmental stewardship, the video explains the balanced approach of energy conservation in existing buildings, high-performance efficiency standards for new construction projects, and a more sustainable energy supply system. To explore the energy supply pillar further, the video highlights the technical differences between Stanford's existing cogeneration plant and proposed heat recovery facility and carefully outlines the potential savings in operating costs and greenhouse emissions. The video proved to be a popular and successful communication tool to educate a broad audience; Sustainable Stanford will continue to update its content throughout the various implementation phases.

More Information:

http://sustainable.stanford.edu/climate_video

http://sustainable.stanford.edu/climate_action

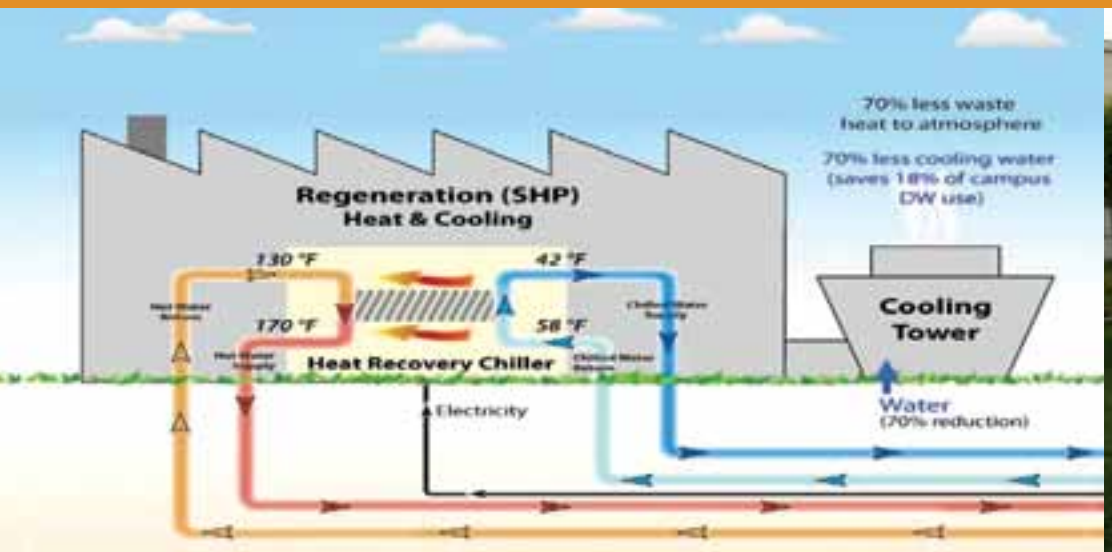
School of Engineering's High-Performance Buildings Open

President John Hennessy joined several hundred members of the Stanford community to formally dedicate the School of Engineering's new Jen-Hsun Huang Engineering Center (HEC) at a reception in the building's outdoor amphitheater. Following the example of its predecessor, the Jerry Yang and Akiko Yamazaki Environment and Energy Building (Y2E2), HEC epitomizes high-performance design and construction. Performance models suggest that aggregate energy use, including plug loads, will be 42% less than those of standard buildings. HEC features an enhanced building envelope with high-performance windows, makes extensive use of daylight and photocell technology, employs a combination of natural ventilation and active chilled beams, includes rapidly renewable materials in architectural woodwork and furniture, and uses the university's recycled water system to flush toilets and urinals. A 30kW DC solar photovoltaic installation will meet some of the building's electricity demand. To complete the HEC auditorium, 316 seats were salvaged from the demolition of Kresge Auditorium, refurbished, and redeployed. HEC is the second completed building of the four that will make up the award-winning Science and Engineering Quad.

More Information:

http://soe.stanford.edu/visit/huang_center/index.html

http://news.stanford.edu/news/2010/october/huang-engineering-dedication-100610.html



Green Living Council Organizes 10/10/10 Global Work Party for 350.org

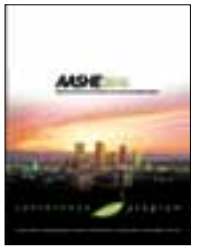
The Green Living Council (GLC) hosted a series of events for 350.org's Global Work Party, starting with a refreshing photo shoot in the Memorial Auditorium fountain. The photograph was submitted to 350.org and added to an online album in which groups from around the world show support of the organization's goal to reduce carbon dioxide levels in the atmosphere to 350 parts per million. GLC members embraced this year's theme for the annual Global Work Party, "A Day to Celebrate Climate Solutions," and used it to raise awareness about ways students can impact climate change during meals. Presentations in Wilbur, FloMo, and Ricker Dining highlighted sustainable behaviors, including choosing trayless dining, eating less meat and dairy, choosing local and organic foods, reducing food waste, and composting. The outreach efforts resulted in more than 150 students pledging to choose sustainable options while dining!

More Information:

http://glc.stanford.edu/

http://www.350.org/

National Conference Highlights Sustainable Stanford's Many Strengths



Sustainable Stanford's programs and success stories were well represented at the Association of the Advancement of Sustainability in Higher Education (AASHE) 2010 Conference in Denver, Colorado. Staff from the Department of Sustainability and Energy Management (SEM) offered six presentations during the two-day event:

- Behavior Matters: Program Results from Stanford, MIT, and Cornell
- Climate Action Implementation on Research Campuses: Lessons from Large-Scale Energy Projects
- Sustainable Transportation at Stanford University: The Role of Transportation Demand Management
- Driving Down Energy Use While IT Load Increases
- Room Temperature Biological Sample Storage
- Y2E2: Built to Conserve, Inspire, and Teach

Engaged audiences and productive dialogue characterized each session, and the conference forum solidified Stanford's position as a sustainability leader among its peer institutions.

More Information:

http://conf2010.aashe.org/

http://www.aashe.org/

Sustainability on the Farm Tour Now a Staple of Reunion Homecoming Weekend

Reunion Homecoming Weekend continues to be an opportunity for Stanford to demonstrate its commitment to sustainability. After a successful inaugural season, the popular Sustainability on the Farm Tour again attracted a capacity crowd aboard one of the diesel-electric hybrid Marguerite shuttles. Staff members provided presentations related to major operational areas, both on the bus and on site via a quick walk. Topics included water, waste and recycling, transportation demand management, energy, sustainable landscaping and grounds, food systems, and high-performance buildings (with an abbreviated Y2E2 tour). Alums of all ages enjoyed the tour and took pride in Stanford's demonstrated leadership in operational sustainability. Sustainability on the Farm is now an annual offering during Reunion Homecoming and other major campus events.

More Information:

http://sustainable.stanford.edu/events

Stanford Maintains "Overall College Sustainability Leader" Title for Third Consecutive Year

For the third consecutive time, and the fourth time in the last five years, Stanford received an A- grade on the Sustainable Endowments Institute's College Sustainability Report Card. Stanford joined 51 other schools as Overall College Sustainability Leaders out of the 322 surveyed institutions. Stanford earned straight A grades on administration, climate change and energy, food and recycling, green building, student involvement, transportation, investment priorities, and shareholder engagement. The A in climate change and energy represents a letter-grade improvement over the B earned in that category previously and recognizes the formalization of the university's Energy and Climate Plan, among other energy conservation programs. Participation in comprehensive annual surveys continues to provide insight for the advancement of Stanford's sustainability programs and strategic planning.

More Information:

http://www.greenreportcard.org/

http://sustainable.stanford.edu/climate_action

Leading Research: Obesity and Hunger—India's Dual Health Problem

Assistant professor of medicine Jeremy Goldhaber-Fiebert is studying undernutrition and obesity in India, thanks to a Woods Institute Environmental Venture Projects (EVP) grant. Contrary to the common perception of pervasive undernourishment, obesity and diabetes are also rampant health concerns in India. Goldhaber-Fiebert and his colleagues are researching how a public health strategy could best help undernourished and obese people without exacerbating either problem. "Their interplay produces complex policy challenges," he said of the two medical conditions. For instance, some Indian families have undernourished and obese members living side by side; public health initiatives addressing undernutrition have inadvertently provided extra food for healthy children; and efforts to curb obesity might harm undernourished people. To effectively address both problems at once, the team is using its grant to develop a computer model to evaluate nutrition-related policies, accounting for the impact of climate change on food availability.

More Information:

http://healthpolicy.stanford.edu/people/jeremygoldhaberfiebert/

http://woods.stanford.edu/cgi-bin/evparchive.php

Food Experts from Stanford's Seven Schools Converge for University's First Food Summit

Stanford's inaugural Food Summit featured an unprecedented gathering of experts on food-related issues from across the university's seven schools. The discourse provided a catalyst for generating solutions to some of the nation's and the planet's most challenging and important crises, including national health, climate, outdated national food policies, and the hidden toll of industrial food production. The event drew a crowd of more than 350 Stanford community members for panel sessions and an appropriately crafted luncheon. A number of partner organizations arranged exhibit booths to showcase Stanford's engagement in local community-based programs. Embracing the notion that "complex problems require multidisciplinary solutions," planning is under way for Food Summit 2, scheduled for fall 2011.

More Information:

http://foodsummit.stanford.edu/

Stanford Athletics Partners with Students to Promote Recycling at Events

Starting at the end of the 2009 football season, Stanford began promoting recycling with announcements on the scoreboard. Similar messaging occurred during softball and baseball games. In 2010, Stanford Athletics expanded the promotion to men's and women's soccer and men's and women's basketball, as well as increasing its visibility during football games. A former student-athlete created a video starring current student-athletes to highlight the importance of recycling. The video aired during each home football game. At the USC game, members of Students for a Sustainable Stanford collected recyclables from tailgating fans and hosted an educational booth inside the stadium. The students collected more than 1,500 cans and bottles. The successful programming will continue during the 2011 season. Go Cardinal!

More Information:
http://bgm.stanford.edu/pssi_stadium_recycling

Sustainable Stanford Launches Educational Webinar Series

The Turn Off For Break campaign for winter closure, the first in the Cardinal Green series of campus-wide conservation campaigns, provided the opportunity for Sustainable Stanford to offer its first-ever educational webinar. This proved a successful communication tool, and each subsequent campaign offered similarly structured webinar training as a key educational component. Featuring subject-matter experts from relevant campus organizations, each webinar provides a historical overview of topic-specific conservation efforts on campus as well as details about campaign logistics and goals. All webinars are free and open to the public, but geared specifically toward the Stanford campus. The recordings of the live presentations remain posted online and serve as a lasting educational resource and training opportunity for the entire community.

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

TomKat Center Provides $1.2 Million for Next-Generation Power Grid Research

The TomKat Center for Sustainable Energy at Stanford awarded four grants totaling $1.2 million to fund university research exploring sustainable and efficient electricity delivery through "smart grid" systems. As summarized in the Stanford Report, sustainable grid designs could reduce greenhouse gas emissions by lowering peak energy demand, increasing conservation, and using renewable resources like the wind and sun to power homes and businesses. The systems also could reduce electricity costs and provide real-time information on usage and rates to utilities and consumers. These inaugural grants from the year-old TomKat Center support its goal to transform the world's energy systems through interdisciplinary research, innovative solutions, and translation to applied technology.

More Information:

http://tomkat.stanford.edu/

http://news.stanford.edu/news/2010/november/power-grid-research-111810.html

Foreign Press and International Universities Visit to Learn from Stanford's Sustainability Programs

Recognized as an international leader in sustainability within higher education, Sustainable Stanford presented to a number of international visitors and delegations throughout the year. A team of international media representatives visited in November to learn more about sustainability initiatives on campus. Organized presentations included an overview of Stanford's sustainability programs and an explanation of the Energy and Climate Plan. The journalists were particularly curious about Stanford's growing suite of behavioral programs and student engagement, as well as the relationship between Stanford and new ventures in cleantech and greentech. Separate delegations from Japan, China, and Taiwan also came to campus this year and met with the Office of Sustainability for tours and presentations. Opportunities to engage with international universities and organizations continue to facilitate program growth and solidify Stanford's important role as a global leader.

More Information:

http://sustainable.stanford.edu/

Steyer-Taylor Center Partners Law and Business Schools to Research Clean Energy

Partially as a result of Stanford's Initiative on the Environment and Sustainability, a component of the Stanford Challenge, all seven schools now offer a range of environmental and sustainability-related courses and research opportunities. As announced in the Stanford Report, thanks to a generous gift, the Stanford Law School and the Graduate School of Business will now embark on an unprecedented partnership to study and deploy clean energy by focusing on policy and finance. Complementing efforts under way at other energy and policy institutes and centers on campus, the newly created Steyer-Taylor Center for Energy Policy and Finance brings together the best minds from both law and business disciplines to advance the development, financing, management, and regulation of clean energy technology.

More Information:
http://news.stanford.edu/news/2010/november/center-energy-policy-113010.html

Leading Research: Monitoring Groundwater from Space Using Satellite Data

At the American Geophysical Union annual meeting, Jessica Reeves, a geophysics doctoral student at Stanford, presented a new way to cheaply and effectively monitor aquifer levels using satellites. To avoid drought, regulators monitor underground water sources in agricultural regions. They use measurements from wells, but there usually are not enough to cover an entire groundwater system. Satellite data can provide reliable information that is more complete, according to Reeves. She analyzed ten years of data for the San Luis Valley in Colorado and found that by aiming special radar at dry patches around farmers' fields, satellites can detect the movements of land above an aquifer as the amount of water grows and shrinks. Hydrologists can then infer how much water lies below. Reeves's work builds on research by her faculty advisors Howard Zebker and Rosemary Knight, a senior fellow at the Woods Institute.

More Information:
http://woods.stanford.edu

Sustainable Stanford Awards 2010–11 Green Fund Grants

The Student Green Fund committee awarded grants to nine deserving projects in the third year of the fund's operation. The committee allocates up to $30,000 annually to projects with the most potential to engage students in making contributions to campus sustainability. The following projects were selected as 2010–11 grant recipients:

- Union Underground: Clothes Loop Thrift Store
- Green Events Consulting
- Columbae Rain Water Harvesting Project
- Smoothie Bike
- iWater App: Location-Based Water Leakage Reporting Tool
- Graduate Student Collective Garden
- Solar Water Heating Installation Project (S-WHIP)
- Green Roofs at Stanford
- Know Your Farmer, Know Your Food

Final reports from projects throughout the Green Fund's history, as well as applications for 2011–12 project grants, are available online.

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

Leading Research: Water, Women, and Children's Health

Among children in Tanzania, roughly two in a hundred die of preventable diarrheal disease by the age of five, despite widespread access to clean water. "Having the infrastructure to deliver clean water is not enough," said Jenna Davis, the Woods Institute's Higgins-Magid faculty fellow. "If water is contaminated at home by inadequate hygiene practices, there will be little improvement to family health." In Tanzania, women usually fetch water for the household, but clean water can be more than half a mile away. A 2009–2010 Clayman Institute faculty research fellow, Davis and her team studied 300 families over ten weeks. Most women the team interviewed understood how water gets tainted, but drinking and cooking took precedence over hygiene when water was hard to get. The research is expanding to 1,200 families for a year, and Davis is developing educational material to help women integrate hygiene into their daily routines easily and consistently."

More Information:
http://woods.stanford.edu
http://gender.stanford.edu

Inaugural Dorm Challenge Encourages Students to Embrace Bicycle Safety

Bicycle safety is an integral part of Stanford's efforts to encourage bicycling as one of the greenest ways to get around. During New Student Orientation, 1,550 students registered their bikes, took an on-site bike safety quiz, were fitted with bike helmets sold on site, and received free bike lights and safety gear. Stanford's first Bike Safety Dorm Challenge was launched in the fall, motivating undergraduate students to pledge to follow the rules of the road and wear a bike helmet for every ride, even short trips. ZAP and Phi Sig tied for the highest percentage of participants and each won a free charter bus trip to Lake Tahoe. NSO events and the Bike Safety Dorm Challenge complement the Stanford bicycle program's ongoing efforts, including free monthly bike safety classes, free bike safety dorm road shows, discounted bike helmets, free bike safety repair stations, and a bike citation diversion class, which offers a bike safety class in lieu of a fine.

More Information:

http://transportation.stanford.edu/dormchallenge

http://transportation.stanford.edu/nso-bike

http://bike.stanford.edu

Leading Research: Program on Food Security and the Environment Launches Food Policy Seminar

Stanford's Program on Food Security and the Environment (FSE) received a grant from the Bill & Melinda Gates Foundation to host a seminar series on international food policy. Starting in winter 2011, experts will gather at Stanford to discuss food security—making enough food available and accessible. They will also talk about how policies can make sure impoverished people benefit from growth in the food and agriculture sector. "Even the best-designed programs and projects at the local scale often fail due to counterproductive national policies," said FSE deputy director and project director Walter Falcon. FSE director Rosamond Naylor said the series' goal is to find ways to supply sufficient food at reasonable prices to all segments of society without destroying the environment. Each seminar's conclusions will be written up in a freely available scholarly paper. The grant also funds development of a high school unit on food policy and food security by the FSE and the Stanford Program on International and Cross-Cultural Education.

More Information:

http://foodsecurity.stanford.edu/

http://spice.stanford.edu/

Winter Closure Campaign Increases Utility Savings by 50%

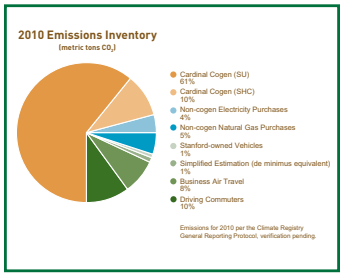
Turn Off For Break, the first campus-wide offering in the Cardinal Green campaign series, encouraged increased savings and participation in the university's annual winter closure. Promoted by a partnership between SEM and Zone Management, the performance goal for the 2010 winter closure was to increase energy and cost savings from the 2009 curtailment by at least 10%. The campus exceeded that goal and achieved the following savings:

- 1.4 million kilowatt-hours of electricity (48% increase from 2009)
- 3.8 million pounds of steam (87% increase from 2009)
- $202,000 in operating costs (54% increase from 2009)
- 778 metric tons of CO2 emissions avoided (63% increase from 2009)

Stanford also made progress towards its goal of 75% participation in winter closure: 101 buildings fully participated and 59 buildings partially participated. This combined rate of 67% represents a 3% increase from 2009. In addition, 23 buildings increased their level of participation. Since 2001, cumulative net energy cost savings from winter closure total $2.2 million, and the team is preparing for another successful campaign in 2011.

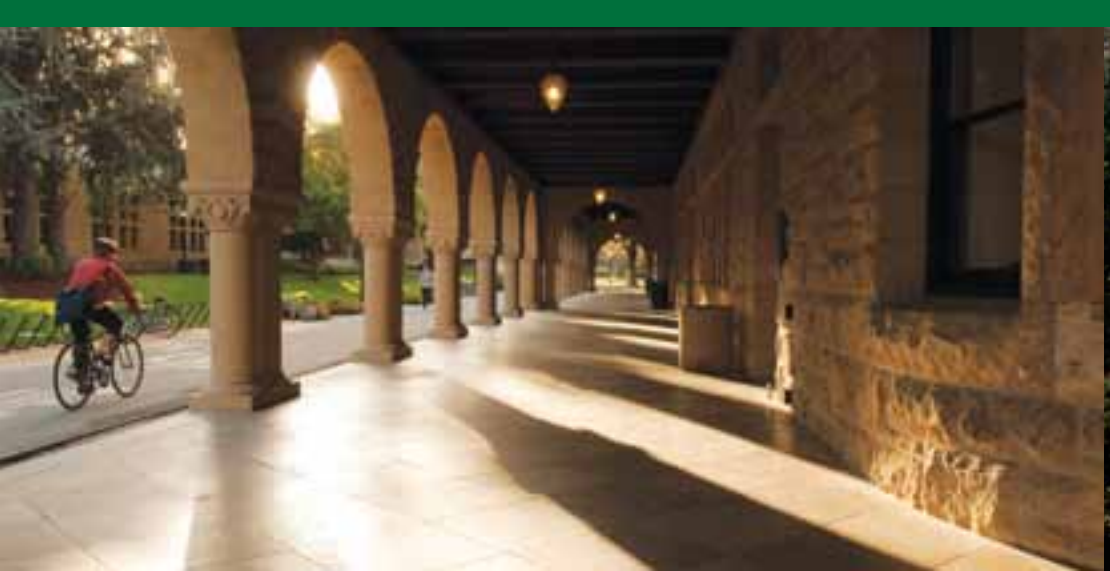
More Information:
http://sustainable.stanford.edu/be_cardinal_green_winter_closure

Fourth Year of Greenhouse Gas Emissions Inventory Receives Verification



For the fourth consecutive year, Stanford received third-party verification of its greenhouse gas (GHG) emissions inventory through the California Climate Action Registry. The university's carbon dioxide equivalent GHG emissions for Scope I and Scope II from the main campus totaled approximately 180,500 metric tons. In addition, the campus prepared unofficial inventories of its Scope III emissions and those attributed to steam and chilled-water deliveries to Stanford Hospital and Clinics. Emissions of the five other GHGs identified in the Kyoto Protocol (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride) were reported for the first time in 2009. Together they comprise one-tenth of one percent of Stanford's total GHG emissions. Third-party verification of the university's 2010 emissions, filed for the first time using the Climate Registry General Reporting Protocol, is already underway. The annual emissions inventory continues to be a valuable tool for Stanford's climate action planning.

More Information:
http://sustainable.stanford.edu/emissions_inventory
http://www.climateregistry.org/



Stanford Students Featured in *New York Times* for Sustainable Fashion

A *New York Times* design feature titled "The Eco Look" included student photographs demonstrating the trend of sustainable fashion on campuses nationwide. Several members of Students for a Sustainable Stanford posed throughout campus wearing environmentally conscious materials, including vintage and thrift-store purchases, inventively repurposed discarded items, and fabric from bamboo and other rapidly renewable sources. The AASHE Weekly Bulletin, a nationally distributed electronic newsletter focused on sustainability in higher education, highlighted the slideshow.

More Information:
http://www.nytimes.com/slideshow/2011/01/09/education/edlife/20110109-trendspotting-ss.html
http://www2.aashe.org/archives/2011/0118.php#2

Increased Promotion of Bicycle Safety: Workshop Reaches Students

Parking & Transportation Services (P&TS) partnered with Students for a Sustainable Stanford to host a free, hands-on bike safety repair clinic to share quick and useful tips for safety checks and minor repairs. Members of the Stanford community dropped in to learn some basics, including how to lubricate a chain, change a flat, and inflate tires. Mechanics from the Campus Bike Shop and Stanford's Bicycle Program coordinator assisted with instruction. All participants also received a pre-ride safety sheet as a reminder to ride and maintain a safe bike.

To further assist local bike riders, Stanford's second and third bike safety repair stands opened at the School of Medicine and at the P&TS office, respectively. The stands enable cyclists to make minor repairs using free tools securely fastened to the rack. A tire pump is also available. The original repair stand sits at the busy intersection of Galvez Mall and Escondido Road. Additional stands are being planned throughout campus, and more clinics will be offered throughout the coming year.

More Information:
http://bike.stanford.edu

Landmark High-Performance Building Y2E2 Wins First-Place ASHRAE Technology Award

Stanford's Y2E2, the anchor building of the new Science and Engineering Quad, was honored with a first-place ASHRAE Technology Award in the new institutional building category. Stanford representatives were on hand in Las Vegas at ASHRAE's 2011 Winter Conference to accept the award, which recognizes Y2E2's exceptional design, innovative use of leading-edge technology, and proven energy performance. Y2E2 currently consumes 44% less energy than code (ASHRAE Standard 90.1-2004). Y2E2 is a first of its kind in California, and its success has spawned similar design strategies for high-performance buildings throughout campus, including the subsequent structures in the Science and Engineering Quad.

More Information:

http://sustainable.stanford.edu/green_buildings

http://www.ashrae.org/pressroom/detail/2011-01-29techawards

Office of the Vice Provost for Undergraduate Education Launches Sustainability Program

Building Level Sustainability Program pilot projects completed in 14 buildings since 2009 have shown a sustained reduction in electricity consumption of 3% to 20% with an average simple payback period of less than nine months. Capitalizing on the momentum of excellent performance during winter closure, the Office of the Vice Provost for Undergraduate Education's Green Team in Sweet Hall adopted a Green Action Menu and began formal BLSP implementation. Targeted conservation measures were selected based on an energy audit and responses to a building-wide occupant survey. Office of Sustainability interns provided support to the team, including individual office visits to help install Smart Strips, timers, and CFLs. In addition to energy efficiency measures, the Green Team plans to implement an office composting program and possibly expand the bike share program. The Office of Sustainability tracked Sweet Hall's electricity consumption throughout the spring, and VPUE achieved an average savings of 18% compared to the same period in the 2010!

More Information:

http://sustainable.stanford.edu/building_level_sustainability

http://vpue.stanford.edu

Students for a Sustainable Stanford Celebrates 10th Anniversary

At the Students for a Sustainable Stanford (SSS) 10th anniversary party, faculty, staff, alumni, and current students gathered at the Haas Center for Public Service to acknowledge and celebrate the student efforts over the last decade to make Stanford a greener campus and university. Former SSS presidents emphasized the active role that members played in instigating campus-wide changes, and dialogue during the event further explored how the group can continue this tradition of influence. Current SSS subgroups include environmental justice, climate change, water, and recycling. During the past academic year, SSS affiliated itself with the Haas Center, led a campaign against Proposition 23, initiated a tailgate recycling program, started a series of sustainable-living workshops, and installed a second rainwater-harvesting system at a student residence. SSS plans to embrace the inspirational messages shared during the anniversary celebration and strive for another year of successful programs in 2011–2012.

More Information:

http://sustainability.stanford.edu

http://studentaffairs.stanford.edu/haas

Leading Research: Leatherback Turtles Tell a Story

Researchers with the Woods Institute for the Environment attached satellite transmitters to leatherback sea turtles in the South Pacific and tracked their movements to better understand the endangered species. Findings were published in the January 1 issue of *Marine Ecology Progress Series*. The scientists achieved the longest leatherback dive recording to date—about 84 minutes. In the South Pacific Gyre, previously presumed barren, the leatherbacks swam and dove as if they were foraging. The endangered turtles dove deeper during the day than at night, just like their prey—gelatinous zooplankton such as jellies. Long fishing lines commonly used to harvest salmon and tuna pose a major danger to the turtles, which can easily snag themselves on the lines. "Understanding what sorts of areas leatherbacks are likely to favor is a critical first step in protecting them in the open ocean," said Stanford biologist George Shillinger, lead author of the paper and director of marine spatial planning at the Center for Ocean Solutions. Overall, Shillinger reported the leatherbacks preferred areas with cooler surface water and stronger upwelling of nutrient-rich water, which attracts prey.

More Information:

http://woods.stanford.edu

http://centerforoceansolutions.org/

http://woods.stanford.edu/cgi-bin/focal.php?name=turtles

Leading Research: BP Oil Spill Commission Adopts Center for Ocean Solutions' Recommendations

The final report to President Obama by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling included key policy recommendations by researchers at the Center for Ocean Solutions. Center staff recommended several changes to federal policy on petroleum leasing along the outer continental shelf, including provisions on interagency consultation and environmental review. The Center for Ocean Solutions is a partnership of Stanford University's Woods Institute for the Environment and Hopkins Marine Station, Monterey Bay Aquarium, and the Monterey Bay Aquarium Research Institute.

More Information:

http://www.centerforoceansolutions.org/

http://woods.stanford.edu

http://www-marine.stanford.edu/

Efficient Marguerite Routes Achieve Further Emissions Reductions

Marguerite: By the Numbers

- Annual ridership (2010): 1,447,616
- Total number of vehicles in fleet: 42
  - Hybrid (diesel-electric) buses: 2
  - Diesel buses: 36
  - Passenger vans: 4
- Total number of Marguerite stops: 184
  - stops on-campus: 113
  - stops off-campus: 71

Stanford implemented major changes to its free Marguerite shuttle routes to conserve fuel, reduce emissions, and reduce operating costs with minimal changes in service levels. By adding extra time in the schedule, the university improved the system's on-time performance. The changes, which minimize route redundancy and make the system more efficient, will eliminate more than 100,000 miles traveled annually by Stanford's diesel and diesel-electric hybrid bus fleet fueled by biodiesel. The Marguerite continues to travel throughout campus and connect with regional transit, medical centers, and nearby shopping, dining, and entertainment.

More Information:

http://marguerite.stanford.edu

http://transportation.stanford.edu/routechanges

National Student Diary Series Features Green Events Consulting Group

AASHE featured Stanford's new student group, Green Events Consulting (GEC), in its new Student Diary Series, an online blog written by university students involved in sustainability projects. A 2010–2011 Green Fund grant recipient, GEC provides peer-to-peer consulting to other student groups interested in hosting more sustainable events. The diary entry chronicles GEC's recent work with the Stanford Association for International Development for the group's annual conference. GEC's 2011 Executive Summary Handbook includes sustainable-event recommendations for student groups and brings additional student perspectives to Stanford's official green event guidelines, published by the Office of Sustainability in 2010, Greening Events at Stanford.

More Information:

http://aashe.org

http://www.aashe.org/blog/aashe-student-diary-series-greening-campus-events#comment-form

http://sustainable.stanford.edu/events

Haas Center for Public Service Partners with Sustainable Stanford

The Office of Sustainability collaborated with the Woods Institute for the Environment to again offer CEE/ES 109 in winter quarter. The service learning course brought together graduate and undergraduate students from diverse academic backgrounds to learn about and contribute to institutionalizing sustainability at Stanford. Through lectures on energy, water, waste, food, transportation, and behavior change by Stanford professors and practitioners, as well as on-site audits at the Haas Center for Public Service, students learned how much the university has already done and how many opportunities remain for further improvement. Capitalizing on the new partnership with the Haas Center, students focused their final projects on the development of proposals to help the Sustainable Haas Committee prepare for successful implementation of the BLSP later this year. Based on course evaluations and topic-specific student reflections, CEE/ES 109 continues to have a positive impact on student awareness and understanding, and course organizers are currently preparing for the third iteration of the now-annual offering.

More Information:

http://sustainable.stanford.edu/students

http://woods.stanford.edu

http://studentaffairs.stanford.edu/haas

http://sem.stanford.edu/building_level_sustainability

League of American Bicyclists Awards Stanford the First and Only Platinum Rating

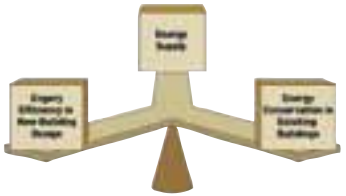
The League of American Bicyclists designated Stanford a Platinum-Level Bicycle Friendly University. This is the first year the league has made these designations, and Stanford was the only university to achieve the platinum rating. The league praised Stanford's high percentage of university bike commuters (21.7%), education and safety programs, incentive programs, and extensive cycling infrastructure. Stanford representatives accepted the award at the National Bike Summit in Washington, D.C. Stanford's comprehensive bike program enables members of the Stanford community to take advantage of the mild climate and flat terrain and embrace bicycling as one of the greenest ways to get around campus.

More Information:

http://www.bikeleague.org

http://bike.stanford.edu

Energy Seminar Features Stanford's Energy Story: Past, Present, and Future

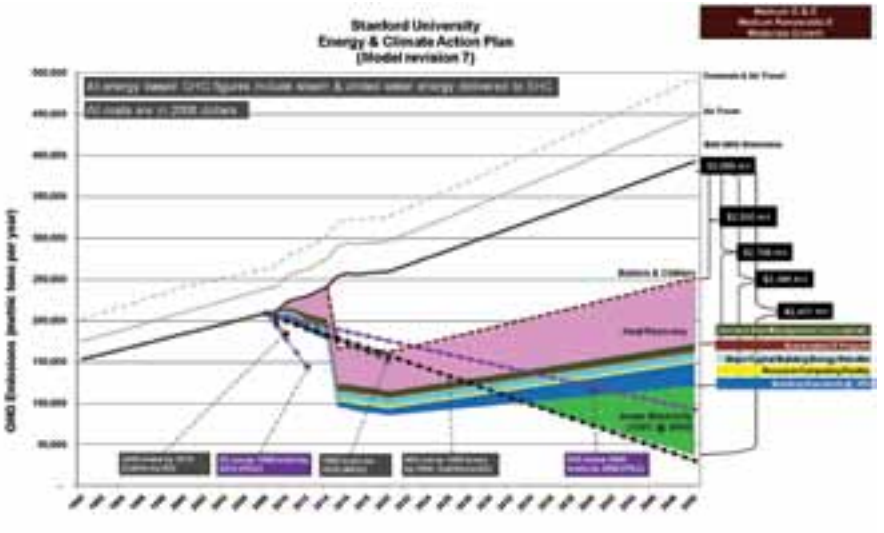


Stanford is in the midst of a new era of sustainable energy management to further improve its operational efficiency and reduce its energy footprint—no small task for a growing campus! Leaders from SEM outlined the university's long-range Energy and Climate Plan during the weekly Energy Seminar series. They presented the three key prongs of the balanced approach that has shaped Stanford's plan—high energy efficiency standards in new buildings, energy conservation in existing buildings, and a greener and more flexible energy supply. They also touched on the untapped potential of behavioral programs to motivate individuals to conserve energy without compromising their quality of life at Stanford. The Energy Seminar, chaired by Professor Sally Benson and managed by the Precourt Institute for Energy and the Woods Institute for the Environment, informs the Stanford community about a wide range of energy and climate change issues and perspectives. The seminar is offered as a for-credit course to Stanford students and is also free and open to the public.

More Information:

http://sustainable.stanford.edu/climate_action

http://energyseminar.stanford.edu/node/337



Stanford's Employee Drive-Alone Rate Reaches All-Time Low—Again!

For the second year in a row, more than half of Stanford University employee commuters use sustainable transportation as their primary mode. In the annual commute survey, 54% of commuting employees reported a sustainable commute. The drive-alone rate dropped to 46% in 2011 from 48% in 2010. Caltrain, bicycling, and carpooling are the most popular alternative transportation modes used. This year, 21% of employees reported taking Caltrain, up from 19% in 2010. Sustainable commutes among all university commuters, including off-campus students, also continued to rise, with 61% of all university commuters saying they use sustainable transportation, compared to 59% in 2010. Since 2002, when the employee drive-alone rate was 72%, Stanford has invested in many programs to encourage adoption of alternative transportation, including free transit passes for eligible employees; vanpool subsidies of $200 per month; Zipcar car-sharing promotions; and the Commute Club, which offers up to $282 per year for not driving alone, among other incentives.

More Information:

http://commuteclub.stanford.edu

http://news.stanford.edu/news/2010/june/annual-commute-survey-060710.html

Stanford Secures Direct Access for Electricity Purchases

In the pursuit of options to lower cost and improve flexibility in its electricity supply Stanford has switched to Direct Access. California enacted Direct Access in the 1990s to promote competition in the electricity supply market and provide consumers with choice in energy service providers. However, the state suspended Direct Access in 2001 during an energy crisis. A very small Direct Access allotment was made available in 2010 on a lottery basis. Stanford secured Direct Access during this lottery and has moved its grid electricity purchases to an independent energy services provider. As a result of Direct Access to the California electricity market, Stanford can continue to explore opportunities for a more economical and environmentally sound power portfolio.

More Information:

http://sustainable.stanford.edu/climate_action

http://www.pge.com/myhome/customerservice/energychoice/directaccesselectricity/

RecycleMania—Stanford Reclaims Second-Place Gorilla Prize

Bolstered by increased publicity from the second campus-wide Cardinal Green campaign, Stanford posted a strong performance in RecycleMania, an annual competition and benchmarking tool for higher education recycling programs. Stanford's final standings included personal best scores in seven of eight categories. In addition to reclaiming the second-place Gorilla Prize, awarded to the campus with the highest total recycling tonnage, Stanford earned top-20 national rankings in all targeted material categories and per capita recycling tonnage:

- per capita collection of recyclables (16th place)
- paper recycling tonnage (11th place)
- cardboard recycling tonnage (12th place)
- bottles and cans recycling tonnage (16th place)
- food waste composting tonnage (17th place)
- total recycling tonnage (2nd place)

During the 2011 RecycleMania campaign, members of the Stanford community took online pledges to show their commitment to not place any recyclable items in the trash. Raffle drawings recognized these individual contributions to Stanford's overall success. A more targeted effort to further reduce overall waste per capita is now in the planning phases for the 2012 campaign.

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

Stanford Again Included in Princeton Review's *Guide to Green Colleges*

The Office of Sustainability completes major third-party sustainability evaluations and surveys throughout the spring and summer. The first organization to publish its 2011 results, the Princeton Review, in partnership with the U.S. Green Building Council, included Stanford in its annual Guide to Green Colleges. The handbook profiles the 311 schools out of 703 that scored 80 or more out of 100 points on a 50-question sustainability survey. Stanford scored 97 points and was included in the publication for the second consecutive year. The half-page profile highlights Stanford's investment in operational sustainability, the transportation demand management program, and the opportunities available for students to learn about and practice sustainability. The Guide to Green Colleges is free and available to the public.

More Information:
http://www.princetonreview.com/green-guide.aspx
http://sustainable.stanford.edu/

Stanford Begins Comprehensive Environmental Study of Searsville Dam

Stanford recently convened a multidisciplinary committee of expert faculty and staff to evaluate Searsville Dam, located in the Stanford foothills within the Jasper Ridge Biological Preserve. As explained in the Stanford Report, committee members will consider the dam's future in light of such issues as the university's research and education activities at Jasper Ridge, its water supply needs, the environmental effects of the dam on habitats and wetlands, flood risks, and the cost and effects of removing the reservoir's considerable sediment. Results of the study could include transitioning the reservoir to marsh and wetland as sedimentation continues, removing sediment and maintaining the dam, modifying the dam for flood control, or removing the dam. The committee will explore the multitude of complex issues surrounding Searsville Dam and report back findings over the next two years.

More Information:
http://news.stanford.edu/news/2011/april/searsville-dam-study-040511.html

Inaugural Faculty Symposium—Connecting the Dots: The Food, Energy, Water, and Climate Nexus

On Earth Day, Stanford experts from a range of disciplines discussed the interconnections and interactions among humanity's uses of food, energy, water, and the environment. "The great global challenges of the century are tightly linked to each other," said Stacey Bent, director of the TomKat Center for Sustainable Energy. Organizers convened the first annual Connecting the Dots symposium because these linkages can be all too easily overlooked or ignored. 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 co-benefits in others. Teams of Stanford students and faculty then led workshops on a range of challenges associated with sustainable food systems. The half-day event, sponsored by the TomKat Center, the Program on Food Security and the Environment, the Woods Institute for the Environment, the Precourt Institute for Energy, and the School of Earth Sciences, ended with a reception featuring sustainable food provided by CoolEatz. Discussion of the symposium's second iteration in spring 2012 is already under way.

More Information:
http://connectingthedots.stanford.edu/

Sustainable Stanford and Vision Earth Celebrate Earth Day

Sustainable Stanford celebrated Earth Day outside the main Vision Earth tent in White Plaza on Friday, April 22, 2011. The Office of Sustainability joined forces with Parking & Transportation Services, PSSI / Stanford Recycling Center, and SEM's water conservation group to host a number of informational tables during the event. In addition to topic-specific resources, the team showcased program highlights and explained opportunities for the campus community to engage with Sustainable Stanford through the Cardinal Green campaign series. Delicious cake was served, T-shirts were raffled, new buttons were unveiled, and visitors from all sectors of the Stanford community stopped by to learn more about Sustainable Stanford's programs. The successful celebration was offered in partnership with BeWell@Stanford, the student-organized Vision Earth celebration, and the Haas Center for Public Service. The annual Earth Day festivities continue to bring together all those involved in sustainability at Stanford to reflect on past accomplishments and plan for the future.

More Information:

http://sustainable.stanford.edu/be_cardinal_green

http://visionearth.stanford.edu/main.html

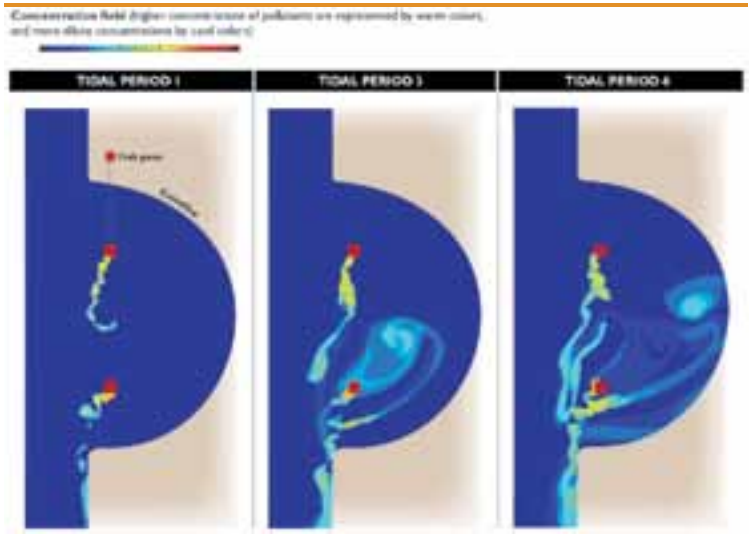
Leading Research: Insights on Aquaculture Pollution

Concentrated waste plumes from fish farms could travel significant distances to reach coastlines, according to a study coauthored by Roz Naylor, Oliver Fringer, and Jeffrey Koseff of the Woods Institute for the Environment. The study, published in the journal *Environmental Fluid Mechanics*, found that relatively high concentrations of dissolved waste from fish pens do not consistently dilute immediately. "This study suggests that we should not simply assume 'dilution is the solution' for aquaculture pollution," said Koseff, professor of civil and environmental engineering and codirector of the Woods Institute. "We discovered that the natural environment around fish pens can dramatically affect how far waste plumes travel from the source." Dissolved substances from feces, undigested food, and other forms of discharge amass near fish pens. In multiple modeling scenarios in which these factors were varied to study how each one affected the behavior of such pollution, effluent was characterized by plumes of highly concentrated waste that held together for great distances from the source. The findings suggest that regulators need to consider the full range of possible influences on the movement of pollution plumes—and accurately identify the dominant factors—when designing water quality regulations for and monitoring waste from aquaculture.

More Information:

http://woods.stanford.edu

VISION EARTH



Knight Management Center Fully Opens with Ten Photovoltaic Arrays

On April 29, 2011, the Stanford Graduate School of Business (GSB) formally dedicated and opened the Knight Management Center, a new facility of eight buildings designed to support the innovative MBA curriculum implemented in 2007. The center is expected to achieve a LEED-NC Platinum certification from the U.S. Green Building Council, the organization's highest rating for sustainability in the built environment. Filled with light and the latest technology, the 360,000-square-foot facility underscores what is taught in many GSB electives, such as Environmental Entrepreneurship and Environmental Science for Managers and Policy Makers, as well as in core classes covering sustainability across business functions and the MBA/MS Environment and Resources joint degree program.

Among many significant sustainability features, the GSB solar photovoltaic (PV) system stands out on campus. The system, now operational, is expected to generate 500,000 kWh per year, enough electricity to meet 12.5% of the center's demand. Rated for a peak output of 355 kW, the Knight Management Center PV installation will generate more electricity than all other campus PV installations combined. As with other features of the new facility, the university's careful monitoring and commissioning programs will ensure performance meets design expectations.

More Information:
http://www.gsb.stanford.edu/news/headlines/knightsustainability.html

Annual Event "A Healthy Taste of Stanford" Features Sustainable Food Options on Campus

Stanford Hospitality & Auxiliaries, a division of R&DE, partnered with BeWell@Stanford to present the second annual Healthy Taste of Stanford event, a free showcase of healthy, organic, and sustainable food options. The event attracted more than 1,000 faculty, staff, and students, who came to learn about healthy eating and nutrition, pick up recipe cards, and enjoy samples of delicious offerings from outside vendors. Visitors could purchase a healthy and sustainably sourced lunch from Stanford's Russo Café and shop for healthy food options at The Market at Munger. Both BeWell@Stanford and Stanford Hospitality & Auxiliaries continue to actively promote healthy and sustainable food options as a key component of individual wellness.

More Information:
http://www.stanford.edu/dept/rde/shaa/healthytaste/
http://bewell.stanford.edu/healthy-taste

New LEED Gold-Equivalent Law School Building Opens

A central theme of openness characterizes the Law School's newly opened William H. Neukom Building. The 65,000-square-foot space features conference rooms, faculty offices, open areas for group work, and the Mills Legal Clinic within four three-story wings connected by dramatic glass-walled pedestrian bridges. As detailed in the Stanford Report, sustainability strategies such as maximized use of natural light, automated control systems, natural ventilation, ceiling fans, high-efficiency glazing, and trellis shading contribute to energy use projected to be 30% less than code. The building's exterior features rainwater harvesting and native plant species. The Neukom Building, a LEED-NC Gold-equivalent project, exemplifies the high-performance design and construction that are now common practice on the Stanford campus.

More Information:

http://www.law.stanford.edu/school/campus/academic_building/

http://news.stanford.edu/news/2011/may/neukom-law-school-051911.html

Bike Month Succeeds: 3,430 Pounds of CO_2 Avoided on Bike to Work Day

For the 10th year, Stanford promoted Bike Month in May, encouraging commuters to choose a green commute. On Bike to Work Day, Stanford hosted nine energizer stations, where a total of 1,117 bicyclists were observed during the morning commute. More than 500 bicyclists reported riding a total of 3,611 miles on Bike to Work Day, averaging 6.7 miles per commute trip to campus. As a result, 3,430 pounds of CO_2 emissions were avoided. In honor of Stanford's designation as the nation's first and only platinum-level Bicycle Friendly University, all riders or walkers who signed in at an energizer station were entered into a drawing to win one of five sets of platinum-colored panniers or gift certificates. In addition, more than 1,700 bicyclists took Stanford's Bike Safety Pledge during Bike Month and committed to wear a helmet for every ride, even short trips, and follow the rules of the road. One of these cyclists won a free bike (donated by the Campus Bike Shop).

More Information:

http://transportation.stanford.edu/btwd

http://news.stanford.edu/thedish/?p=13013

Public Matadero Trail Opens

Stanford built and opened a new mixed-use trail connecting the intersection of Page Mill Road and Foothill Expressway to Arastradero Road. As described in the Stanford Report, the completion of Matadero Trail satisfies one of more than 100 conditions outlined in the 2000 General Use Permit (GUP), which is Stanford's long-term land use agreement with Santa Clara County. The GUP governs land use on more than 4,000 acres of Stanford land within Santa Clara County. The trail is publicly available, and visitors can enjoy hiking or biking year round during daylight hours—on a clear day it is even possible to see the San Francisco city skyline at the trail's crest. At present the trail includes a paved section for bikers and pedestrians from Foothill Road to the crest and a hiking-only unpaved section from Deer Creek Road to Arastradero Road. Future bike lanes are planned along Deer Creek Road to allow cyclists to reach Arastradero Road.

More Information:

http://news.stanford.edu/news/2011/may/new-matadero-trail-052011.html

http://news.stanford.edu/news/2011/may/matadero_trail_map.pdf

Cantor Arts Center Whole Building Retrofit Project Receives $123,000 PG&E Rebate

The 140,000-square-foot Cantor Arts Center is housed in one of the most historic buildings on Stanford's campus. As a museum, the building requires tight humidity controls to serve various art and exhibit galleries. Under the Whole Building Retrofit Program (WBRP), the building's steam humidifiers were replaced by energy-efficient ultrasonic humidifiers, which use clean water to generate water mist without raising the temperature and therefore require less energy. The project also included an energy management control system upgrade, new LED lights for some areas, and additional sensors to provide granular humidity and temperature data on exhibit areas for better environmental control. To leverage contractor mobilization, several maintenance projects were implemented concurrently. Stanford received a rebate check from PG&E for $122,794 after successful project completion. Following in the footsteps of more than a dozen prior WBRP projects, the Cantor Arts Center retrofit yielded a 4.4-year discounted payback with an estimated utility savings of 13% annually.

More Information:

http://sustainablestanford.stanford.edu/energy_initiatives

http://museum.stanford.edu/

Stanford Dining Reinvigorates Dining Hall Gardens

With the summer growing season in full swing and the home garden movement gaining momentum, Stanford Dining, a division of R&DE, decided to breathe some renewed life into the gardens that adjoin each dining hall. Nearly all of the gardens were outfitted with raised beds made from redwood lumber, specifically selected for its ability to withstand microbial decay under damp conditions. All gardens were amended with an organic compost area, which provides the best of all fertilizers. Installed irrigation systems were primarily 5/8-inch drip emitter lines, among the most efficient systems in terms of water use and plant productivity. Plants were chosen in consideration of Stanford's climate, and where available, heirloom varietals were chosen because of superior taste and quality. Stanford Dining took a strategic approach to planning each garden by incorporating companion plants, groups of plants that do better when grown in proximity to one another. For example, tomatoes and basil are considered companion plants because some insects that thrive on basil are repelled by tomatoes, and vice versa. Though the gardens look new, their original mission to serve as educational tools and as another way to connect Stanford's kitchens with fresh local organic produce remains unchanged.

More Information:

http://dining.stanford.edu

http://www.stanford.edu/dept/rde/dining/gardens.htm

ASSU Awards Action Grant to Evaluate Campus Solar Energy Potential

The Associated Students of Stanford University (ASSU) awarded the Stanford Solar and Wind Energy Project one of its inaugural Executive Action Grants to perform solar energy modeling and economic analysis of a proposed campus-wide photovoltaic system. The modeling software and supporting datasets were successfully loaded to the Atmosphere/Energy lab's computer in the spring. SWEP is now finalizing results from the study, which encompassed more than 100 campus roofs and a range of other installation sites. Preliminary results suggest the group has discovered an excellent solar resource on campus, as well as enough installation capacity—13 MW on rooftops alone—to satisfy a significant percentage of Stanford's annual electricity demand with power from the sun. The students have been collaborating with SEM to suggest optimal sites for potential solar panel installations, which could translate to a significant opportunity for the campus in coming years.

More Information:

http://inversion.stanford.edu/swep/drupal/

Leading Research: Reforesting Rural Lands in China Pays Big Dividends

An innovative program to encourage sustainable farming in rural China has helped restore eroded forestland while producing economic gains for many farmers, according to a new study. "The Sloping Land Conversion Program, which began in 2000 after massive flooding caused in part by land clearing, focuses on China's largest source of soil erosion and flood risk—farms on steep slopes," explained Gretchen Daily, a professor of biology at Stanford and a senior fellow at the Woods Institute for the Environment. "It's a tremendously innovative program designed to address two critical problems—securing the environment and providing economic opportunities for people in rural, desperately poor areas," said Daily, who also codirects the Natural Capital Project at Stanford. The Natural Capital Project has developed a software tool called InVEST that is helping the Chinese government decide where to focus conservation and restoration efforts, based on the potential return on investment for society in the form of ecosystem services, such as water purification and biodiversity conservation.

More Information:

http://woods.stanford.edu

http://www.naturalcapitalproject.org/about.html

Tell Your Water Tale Campaign Encourages Stanford Community to Report Water Waste

Over the past decade, Stanford's water conservation programs have focused on indoor, domestic water consumption, but they are now expanding to include measures aimed at conserving outdoor water use in landscaped areas. During the dry season, landscaped areas on campus are irrigated using the university's nonpotable water supply. Using this lake water for outdoor irrigation allows Stanford to preserve potable water for domestic, research, academic, and academic support facility use. Thus, maintaining outdoor fixtures to optimize efficiency is crucial. Through interactive, electronic water action reports, the Tell Your Water Tale campaign, the third offering in the campus-wide Cardinal Green series, provided a vehicle for the Stanford community to identify opportunities for additional landscape irrigation efficiency. During the four-week campaign, faculty, staff, and students reported leaking sprinklers, misdirected sprinklers, soggy lawns, and standing water. All water action reports were triaged and subsequently addressed by university operations.

More Information:

http://sustainable.stanford.edu/be_cardinal_green_waterwise

Woods Institute Awards 2011 Environmental Venture Project Grants

The Woods Institute for the Environment awarded seven grants totaling $1,025,000 over two years in its latest round of EVP funding, bringing the grant total to more than $6.4 million since the program's inception in 2004. The seven projects selected to receive funding this year embody the EVP mission to harness interdisciplinary research to promote global sustainability:

- Compromised Groundwater Quality Resulting from Large-Scale Damming Projects
- Rapid Assessment of Human Exposure to Airborne Persistent Organic Pollutants
- Geography of Food Contamination by Coal Emissions in N.W. China
- How Marine Species Affect Ocean Acidification
- Facilitating Pro-Environmental Behavior
- Rural Health and Development at the Food-Water Nexus
- Electrically Conducting Nanomaterials Filter for Point-of-Use Water Disinfection

More Information:

http://woods.stanford.edu/cgi-bin/evp.php

http://news.stanford.edu/news/2011/june/environmental-project-awards-062711.html

ERP Express Rebates Launched to Fund Behavioral Programs.

Building on decades of success with the customizable Energy Retrofit Program (ERP) brand, SEM announced the formalization of two ERP Express Rebate Programs geared specifically towards laboratory and office equipment. SEM partnered with the School of Medicine (SOM) to offer financial incentives to labs that put DNA and RNA samples into room-temperature storage and dispose of old ultra-low-temperature freezers. The FY11 Cash for Clunkers program made it easy to try room-temperature storage technology and earn rebates up to $13,000. Researchers outside SOM could earn cash back through the ERP Express for Laboratory Equipment program. The ERP Express for Office Equipment program incentivizes departments to purchase and install small energy-saving devices like Smart Strips and appliance timers. This new FY11 offering supports the Building Level Sustainability Program, a platform for Stanford's schools and departments to educate occupants and implement sustainability practices at the building level. Both rebate programs feature online applications and FAQ resources, and have already been approved for FY12 funding.

More Information:

http://sustainable.stanford.edu/energy_initiatives

Stanford Energy Club Thrives in Inaugural Year

At the start of fall quarter, Stanford Energy Web merged with Energy Crossroads to form the new student-organized Stanford Energy Club (SEC), which strives to network Stanford students, scholars, and local professionals at all levels, regardless of discipline, who are interested in energy issues. By the end of the academic year, more than 600 people had become members of the network, perhaps encouraged by SEC's guarantee of only one e-mail per week. The club's website compiles and lists energy events at Stanford and around the Bay Area, explains the many different energy research efforts at the university, allows members to connect through a searchable database, lists all energy-related courses at Stanford, and houses an energy job board. In addition, the club held biweekly energy socials during the academic year, collaborated on the Berkeley-Stanford Cleantech Conference, hosted the inaugural Stanford Energy Showcase and Energy 360—a single event designed as a deep dive into a specific energy topic— and organized visits to local companies and facilities. The club expects to continue its phenomenal growth and expand its reach further in the 2011–2012 academic year.

More Information:
http://energy.stanford.edu/

Green Move Out Features Numerous Student Initiatives Targeting Reuse

As students finished final exams and celebrated the end of the school year, several student groups partnered to ensure a successful Green Move Out focused on reuse and waste reduction. Student Housing coordinated various resources and opportunities, and the Green Living Council, Students for a Sustainable Stanford, and the Clothes Loop hosted the second annual Green Free Store. The event welcomed the entire Stanford community to drop off and take away items at no cost. Building on the success of the 2010 Green Free Store, students expanded the event and offered it at two locations. Featuring music, free food, and dorm room accessories laid across Wilbur and Roble Fields, the now-annual Green Free Store attracted many attendees. It also helped host Project KickBack's inaugural competition by serving as a collection point for shoes to be reused and recycled.

More Information:
http://www.stanford.edu/dept/rde/greenmoveout/
http://www.youtube.com/watch?v=tf1sDML2uCY

Sustainable Purchasing Campaign Receives Record Pledges

In its first week, the One Less, Save More campaign, the fourth offering in the campus-wide Cardinal Green series, had record participation from the Stanford community. By the end of the six-week effort, more than 475 sustainable purchasing pledges were received. Purchasing and Contracts and the Office of Sustainability, launched the campaign to promote purchasing habits at Stanford that minimize negative impacts on the environment while appropriately supporting teaching, learning, and research needs. The campaign asked the Stanford community to consume less, consolidate orders, and choose reusable and recycled-content products. Compared to the same period in 2010, the campaign resulted in the following improvements:

- 3% fewer orders
- 9.5% reduction in daily order costs
- An increase from 63% to 89% of paper orders with recycled content

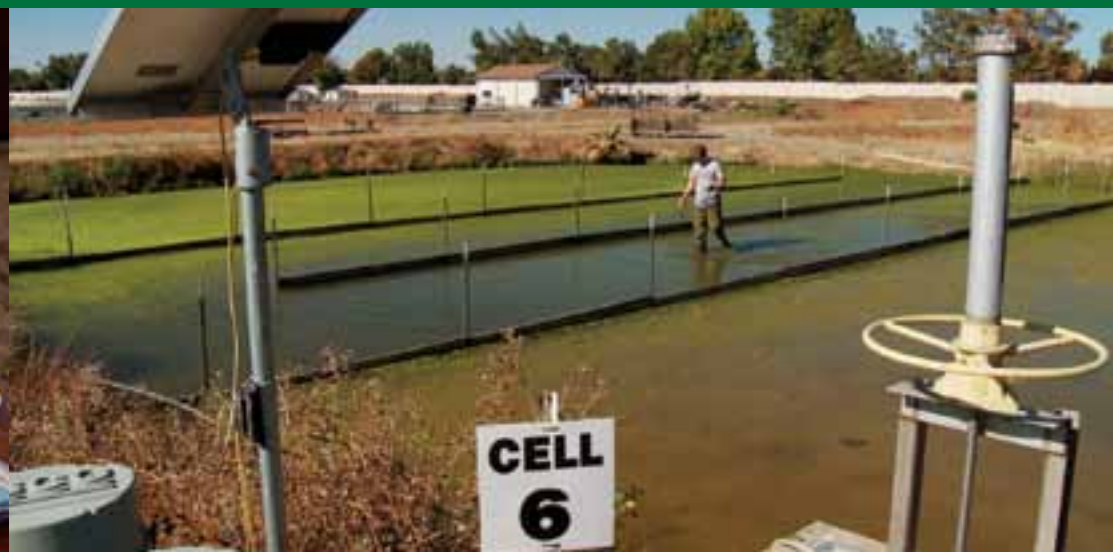
In light of the success and strong campus interest, planning has already begun for next year's effort to affect campus purchasing norms.

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

Leading Research: Stanford Selected to Lead Freshwater Engineering Research Center

America's cities face a looming water crisis driven by climate change, growing population, and crumbling infrastructure. Recognizing the critical importance of this issue, the National Science Foundation selected a multi-university team from Stanford, UC Berkeley, Colorado School of Mines, and New Mexico State to form an engineering research center to address this challenge by developing new, sustainable ways to manage urban water. The initial grant is $18.5 million spread over five years, with additional millions to come in the subsequent five-year period following in-progress reviews. "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 Stanford professor of civil and environmental engineering and senior fellow at the Woods Institute for the Environment. "We're clearing the slate. Nothing is being taken for granted. 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."

More Information:
http://woods.stanford.edu
http://www.nsf.gov/



Energy-Efficient Design Guide for Server/Telecom Rooms

Sustainable IT, Zone Management, and IT Services collaborated to address a long-standing challenge for schools and departments—how to design and build energy-efficient telecom and server rooms in buildings across campus. The Server/Telecom Room Design Guide is now part of Stanford's Facility Design Guide, used by faculty, staff, and design professionals during the planning and early design phases of campus construction projects. Sustainable IT studied a broad cross-section of campus server rooms and determined that although frequently allocated less than 5% of a building's floor area, they can consume as much as 50% of its energy, including both chilled water and electricity! The new recommendations target efficient design and aim to significantly reduce utility consumption and costs. A checklist is provided to help select the optimal cooling system for each room, and the guide strongly recommends installation of dedicated energy monitoring devices to facilitate continuous measurement and tracking of energy use to verify that performance meets design expectations.

More Information:

http://bgm.stanford.edu/server_telecom

http://sustainable.stanford.edu/sustainable_it

Stanford Showcases Programs at 2011 California Higher Education Sustainability Conference

Stanford University (SU) and Stanford Hospital & Clinics (SH&C) delivered presentations highlighting innovative programs and sharing success stories at the 2011 California Higher Education Sustainability Conference (CHESC), in Long Beach, California. The breadth of presentation topics demonstrates Stanford's comprehensive commitment to sustainability:

- Healthy and Sustainable Foods (SH&C)
- Making a Business Case for Behavior-Based Programs and Engaging Stakeholders (SU)
- Teaching Students to Address Sustainability Challenges through Market-Based Solutions (SU)
- Waste Reduction Efforts in a Healthcare Setting (SH&C)
- A Comprehensive Campus-Wide Approach to Water Resources Management (SU)
- Utilizing Service Learning to Enhance the Curriculum (SU)
- Greening the Operating Room (SH&C)
- Surpassing Green Standards in Science Buildings (SU)

Annual CHESC participation remains an opportunity for sustainability staff to learn from other California institutions and benchmark Stanford's programs.

More Information:

http://www.cahigheredusustainability.org/default.aspx

Campus Charging Stations Upgraded to Meet New Electric Vehicle Standards

Parking & Transportation Services (P&TS) installed a total of six new J1722 electric vehicle charging stations across campus. The new stations replace Avcon and SPI charging stations installed in 2003 that are not compatible with the newest generation of electric vehicles. Two new charging stations were installed in Parking Structure 5 in July, and two more were installed in September at Stanford's Visitor Center and at Tresidder Memorial Union. The chargers were provided through a Department of Energy grant to ChargePoint America. New chargers have the SAE J1772 connector for 240V charging, which is the new standard adopted by automobile manufactures, as well as standard 120V outlets. These chargers are compatible with the Nissan Leaf, Chevy Volt and upcoming models, such as the plug-in Prius. One 240V SPI charger compatible with older-generation electric vehicles, also remains available at Parking Structure 5. Payment for charging sessions can be made through the ChargePoint network, which accepts ChargePass Cards and contactless credit cards, or by phone using a standard credit card.

More Information:
http://www.mychargepoint.net

Stanford Improves Campus Greenhouses with LED Lighting

Greenhouse lighting prior to the retrofit.

Stanford's Department of Biology often requires the use of greenhouses to support research. In these facilities, grow lights operate up to 18 hours each day. Until this summer, Stanford's greenhouses used high-pressure sodium lighting to meet this need with either 400- or 1,000-watt fixtures. Funded as a customized Energy Retrofit Project, eight greenhouses have now been converted to LED fixtures that operate at a maximum of 168 watts and save an estimated 248,000 kWh a year! LED fixtures also provide more uniform lighting, better control of light spectra delivered, and a life cycle of 50,000 operational hours. Two additional phases of LED retrofits within other campus greenhouses are currently being coordinated with university researchers.

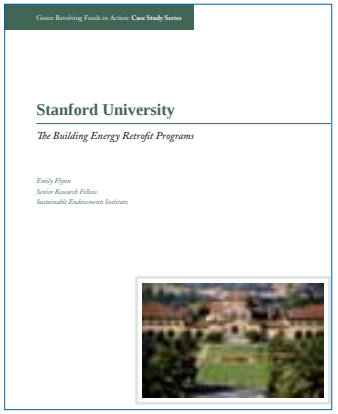
More Information:
http://sustainable.stanford.edu/energy_initiatives

Stanford's First Customized Building Dashboard for Y2E2

Y2E2 is now home to the university's first customized dashboard pilot. The interactive display, accessible online and via lobby kiosks, reports real-time consumption data from all campus utility services, including electricity, steam, chilled water, and domestic water, as well as real-time electricity production from the building's solar photovoltaic installation. Comparative by design, the dashboard separates out load types and building areas to zero in on specific resource uses, as well as documenting Y2E2's performance relative to other campus buildings with equivalent functions. The customized dashboard goes beyond data reporting and serves as an educational tool to call attention to Y2E2's sustainability features and invite active participation in Stanford's wide range of sustainability programs. Many buildings are expected to have similarly customized dashboards installed in the coming years.

More Information:
http://www.buildingdashboard.com/clients/stanford/y2e2/

Sustainable Endowments Institute Highlights Stanford in Green Revolving Loan Fund Report



The Sustainable Endowments Institute (SEI), the organization responsible for the sustainability survey and evaluation published annually in the Green Report Card, opted to take a sabbatical this summer to focus on detailed investigation of green revolving funds. As shown in SEI's report *Greening the Bottom Line: The Trend toward Green Revolving Funds on Campus*, the ERP, the WBRP, and the Water Conservation Program contributed to Stanford's having the largest fund size of universities surveyed, the most invested capital, and the greatest number of projects. As a follow-up, SEI published a Stanford-specific case study to explore these retrofit and conservation programs in much greater detail. With this publication, Stanford joins just nine other schools profiled for exceptional investment in efficiency.

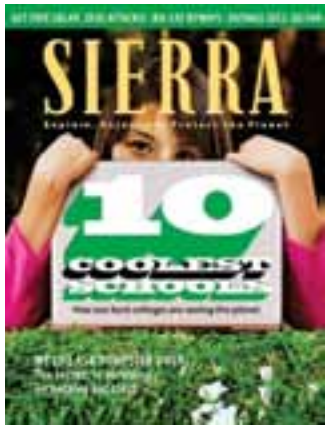
More Information:
http://www.endowmentinstitute.org/cases/stanford.pdf
http://www.greeningthebottomline.org/

Caretakers Go Green! LBRE Leads by Example with Building Level Sustainability Program

In an effort to lead by example and pilot a clustered approach to implementation, Land, Buildings & Real Estate embarked on a rollout of the BLSP within nine Bonair Siding buildings. Led by a dedicated group of Building Champions, the "Caretakers Go Green" project takes advantage of new tools and resources available to support BLSP, including revised building audit templates and the ERP Express rebate program for office equipment. Smart Strips and appliance timers have been deployed throughout the nine buildings, delamping is scheduled, and a pilot compost program will start in September. The Office of Sustainability will monitor electricity consumption throughout the fall and publicize results to the Stanford community during the upcoming fall campaign to expand campus-wide BLSP participation.

More Information:
http://sem.stanford.edu/building_level_sustainability

Stanford Repeats Fifth-Place Ranking in Sierra Magazine's Cool Schools Survey



For the second consecutive year, Stanford placed fifth in *Sierra* magazine's "Cool Schools" sustainability survey, making it one of the "coolest" schools in the country. Stanford improved its scores on Food and Purchasing questions and maintained last year's perfect or near-perfect scores on Academics, Waste, and Other Programs/Initiatives. Published in the September/October 2011 issue of Sierra, the feature story praises Stanford's commitment to open space, comprehensive bicycling infrastructure, and free Marguerite shuttle system.

More Information:
http://www.sierraclub.org/sierra/201109/coolschools/
http://www.sierraclub.org/sierra/201109/coolschools/top10/slide5.aspx

Sustainable Stanford
2010-2011

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 includes recognition across a wide range of topic areas.

A selection of the most significant campus sustainability initiatives to receive formal recognition is included below.

Third-Party Evaluations

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

Sierra Club "Cool Schools," fifth place (2010 and 2011); A- grade and 26th place (2009)

U.S. Green Building Council and Princeton Review's *Guide to Green Colleges*, 97 out of 100 available points, among the best of more than 700 colleges and universities surveyed (2010 and 2011)

Greenopia Top 10 "Three Leaves" Ranking, out of 100 schools surveyed (2009)

Discovery Communications Honor Roll, top 10 ranking (2009)

Buildings

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

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

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 Jasper Ridge Field Station, 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 the Stauffer Building I laboratory VAV conversion project in the existing institutional building category (2010)

Honorable Mention, Flex Your Power Awards (2005)

Project Rebates

Cantor Art Center Retrofit, $122,000 rebate from PG&E (2011)

Alumni Center Window Film Installation, $11,000 rebate from PG&E (2011)

Parking Structures 2 and 6 Lighting Retrofit, $13,000 rebate from PG&E (2010)

Y2E2 Photovoltaic Installation, $38,000 rebate from PG&E (2009)

Avery Aquatic Center Pump Retrofit, $110,000 rebate from PG&E (2009)

Business Continuity Data Center, $48,000 rebate from PG&E (2009)

School of Medicine Server Virtualization, $8,988 rebate from PG&E (2009)

Stauffer Building II Laboratory VAV Conversion, $110,000 rebate from PG&E (2008)

Desktop Power Management, $55,000 rebate from PG&E (2008)

Stauffer Building I Laboratory VAV Conversion, $180,000 rebate from PG&E (2007)

Reservoir 2 Photovoltaic Installation, $135,000 rebate from PG&E (2004)

Food

Finalist, Real Food Challenge Administrator or Faculty Member of the Year Award, for Stanford Dining's Sustainable Food Program coordinator (2011)

Sourcing Sustainable Seafood Panelist, National Restaurant Association, for Stanford Dining's executive director (2011)

Judge, Acterra Sustainability Awards, Stanford Dining's Sustainable Food Program coordinator (2011) and Stanford Dining's executive director (2008–2010)

Invited Sustainable Food Showcase, Cooking for Solutions, for Stanford Dining's Sustainable Food Program coordinator and Stanford catering chef, Monterey Bay Aquarium (2011)

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

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

Certified as a Green Business, Stanford Dining, one of the first university food service operations in the United States so certified, Santa Clara County (2004)

Land, Landscape, and Grounds

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 the Stanford Arizona Garden, California Preservation Foundation (2008)

Governor's Historic Preservation Award, for faculty houses project in the 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 the 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 the Palm Drive restoration, American Society of Landscape Architects (1995)

Research (Woods Institute Faculty Awards)

Jeff Koseff Receives 2011 Eugene L. Grant Award: Professor Jeffrey R. Koseff was recognized for his continued dedication and excellence in teaching as voted by students of the Stanford Department of Civil and Environmental Engineering. (June 2011)

Stephen Palumbi Receives Benchley Award for Ocean Science: Senior Fellow Stephen Palumbi has received the 2011 Peter Benchley Ocean Award for Excellence in Science for his work exposing the sale of contaminated dolphin meat in Japan. (May 2011)

Jennifer Burney Named 2011 National Geographic Emerging Explorer: Jennifer Burney, an affiliate with the Program on Food Security and the Environment, is among "14 visionary, young trailblazers" named to the 2011 class of National Geographic Emerging Explorers. (May 2011)

Woods Researchers Named Google Science Communication Fellows: To foster a more open scientific dialogue, the Google Foundation has named 21 Google Science Communication Fellows, including Noah Diffenbaugh and David Lobell, both Woods fellows, and Susanne Moser, a social science research associate based at the Center for Ocean Solutions. (February 2011)

Jon Krosnick Elected AAAS Fellow: Senior Fellow Jon Krosnick, a professor of political science and of communication, has been named a fellow of the American Association for the Advancement of Science. Krosnick was recognized for his "outstanding research in political psychology, leadership of the American National Election Studies and innovative contributions to survey methodology, including assessment of alternative modes of survey administration." (January 2011)

Scott Rozelle and Gary Schoolnik Receive Global Underdevelopment Action Grants: Two Woods Institute senior fellows are among nine Stanford scholars awarded Global Underdevelopment Action grants from the Freeman Spogli Institute for International Studies. Scott Rozelle will study nutrition and education in rural China, and Gary Schoolnik will conduct research on controlling tuberculosis in North Korea. (December 2010)

Stephen Palumbi, Colleagues Receive Grant to Study Effects of Ocean Acidification: Senior Fellow Stephen Palumbi and colleagues with the Partnership for Interdisciplinary Studies of Coastal Oceans received a three-year, $2 million grant from the National Science Foundation to study the impacts of acidic ocean waters on two ecologically important species—sea urchins and mussels. (November 2010)

Senior Fellow Mark Jacobson Appointed to Federal Energy Advisory Committee: Senior Fellow Mark Jacobson is one of 19 experts named to the Department of Energy's new Energy Efficiency and Renewable Energy Advisory Committee. Members will advise the secretary of energy on transformative research that expedites green job growth, enhances energy security, and safeguards the environment. (November 2010)

Gretchen Daily and Terry Root Named California Academy of Sciences Fellows: Senior Fellows Gretchen Daily and Terry Root are among 12 researchers selected as 2010 fellows of the California Academy of Sciences. Senior Fellow Stephen Schneider, who died on July 19, 2010, was recognized posthumously at the academy fellows' meeting. (October 2010)

Terry Root Receives Science Conservation Award from Defenders of Wildlife: Senior Fellow Terry Root has been given the Spirit of Defenders Award for Science by Washington, D.C.–based Defenders of Wildlife. Root was recognized for "her illuminating research and innovative work to help wildlife survive climate change, [which] has served as a wake-up call for conservationists and natural resource managers around the world." (September 2010)

Gretchen Daily Receives 2010 Heinz Award: Senior Fellow Gretchen Daily has been named one of 10 recipients of the 2010 Heinz Awards. In announcing the award, the Heinz Family Foundation cited Daily "for her innovative work to place a value on the services provided by natural ecosystems (clean air and water, food etc.), which has resulted in increasing momentum towards the conservation of the environment." (September 2010)

Gretchen Daily Wins Midori Prize for Biodiversity: Senior Fellow Gretchen Daily is one of three winners of the 2010 Midori Prize for biodiversity. The announcement was made on September 21 at a meeting of the UN General Assembly in New York. Daily was recognized for her work on quantifying the financial value of ecosystem services and encouraging businesses to take sustainability into account when making decisions. The prize is sponsored by the Aeon Environmental Foundation in Japan. (September 2010)

Senior Fellow Harold Mooney Receives Volvo Environment Prize: Senior Fellow Harold A. Mooney has received the Volvo Environment Prize in Sweden. The prize "recognizes and honors the pioneering contributions of this remarkable individual to science and policy that are vital to present and future generations and the ecosystems that support them." (August 2010)

David Lobell Receives Macelwane Medal from American Geophysical Union: Freeman Spogli Institute for International Studies and Woods Institute for the Environment Center Fellow David Lobell was awarded the James B. Macelwane Medal from the American Geophysical Union for "significant contributions to the geophysical sciences by an outstanding young scientist (less than 36 years of age)." (August 2010)

Peter Vitousek Accepts Japan Prize for Environmental Research: In April 2010, biology professor and Woods Institute for the Environment Senior Fellow Peter Vitousek accepted the Japan Prize for pioneering work in biogeochemistry and global sustainability. The prize was awarded in Tokyo by the Science and Technology Foundation of Japan. (January 2010)

Stanford Ecologist Paul Ehrlich to Receive Ramon Margalef Prize **in Spain:** Instead of pouring tax money into automobile industry bailouts, the government should invest in a new infrastructure to deal with changing climate patterns, says Professor of Ecology and Woods Institute for the Environment Senior Fellow Paul Ehrlich. Ehrlich spoke to the Stanford Report before leaving for Spain to receive the Ramon Margalef Prize for lifetime achievement in ecology and environmental sciences. (November 2009)

Stanford Research Team Receives Funding to Study Energy Efficiency and Human Behavior: The Department of Energy awarded Stanford researchers a grant to develop an interactive software system that encourages energy efficiency. The faculty research team includes Banny Banerjee (mechanical engineering), Martin Fischer (civil and environmental engineering), Abby King (medicine), Scott Klemmer (computer science), and Sam McClure and Gregory Walton (psychology)—recipients of 2008 planning grants from the Woods Institute and Precourt Energy Efficiency Center to develop behavior and public policy research components for a campus-wide initiative on the sustainable built environment. (November 2009)

Chris Field Receives Heinz Award for Environmental Science and Leadership: Christopher Field, a professor of biology and of environmental Earth system science at Stanford University and a senior fellow at the Woods Institute for the Environment, has been named a 2009 Heinz Award recipient. The Heinz Family Foundation cited Field "for his leadership and innovation in carbon cycle and climate science." (September 2009)

Gretchen Daily Wins $420,000 Award for Finding Ways to Save Biodiversity: Stanford Professor of Biology and Woods Institute for the Environment Senior Fellow Gretchen Daily has won the International Cosmos Prize, awarded by the Expo '90 Foundation in Japan. Expo '90 lauded her as "a researcher who has provided us with a comprehensive picture of the value of biodiversity-based ecosystem services, upon which human society is dependent." The prize includes a commendation, a medallion, and 40 million yen, approximately $420,000. (July 2009)

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 (2002–2011)

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

Innovative Transportation Solutions Award, WTS, 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 the Stanford Fleet Garage, recognizing commitment to environmentally responsible operations, County of Santa Clara (2004–2007)

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

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

In the **RecycleMania 2011** contest, Stanford scored in the 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)

In the **RecycleMania 2010** contest, Stanford scored in the 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)

In the **RecycleMania 2009** contest, Stanford scored in the top 20 in five of the eight categories: per capita (16); gorilla (3); paper (9); cardboard (17); and food waste (6)

In the **RecycleMania 2008** contest, Stanford scored in the 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)

In the **RecycleMania 2007** contest, Stanford scored in the 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 the Environmental Health and Safety battery recycling and mercury thermometer replacement program, Environmental Protection Agency (2002)

Outstanding School Program Award, National Recycling Coalition (2002)

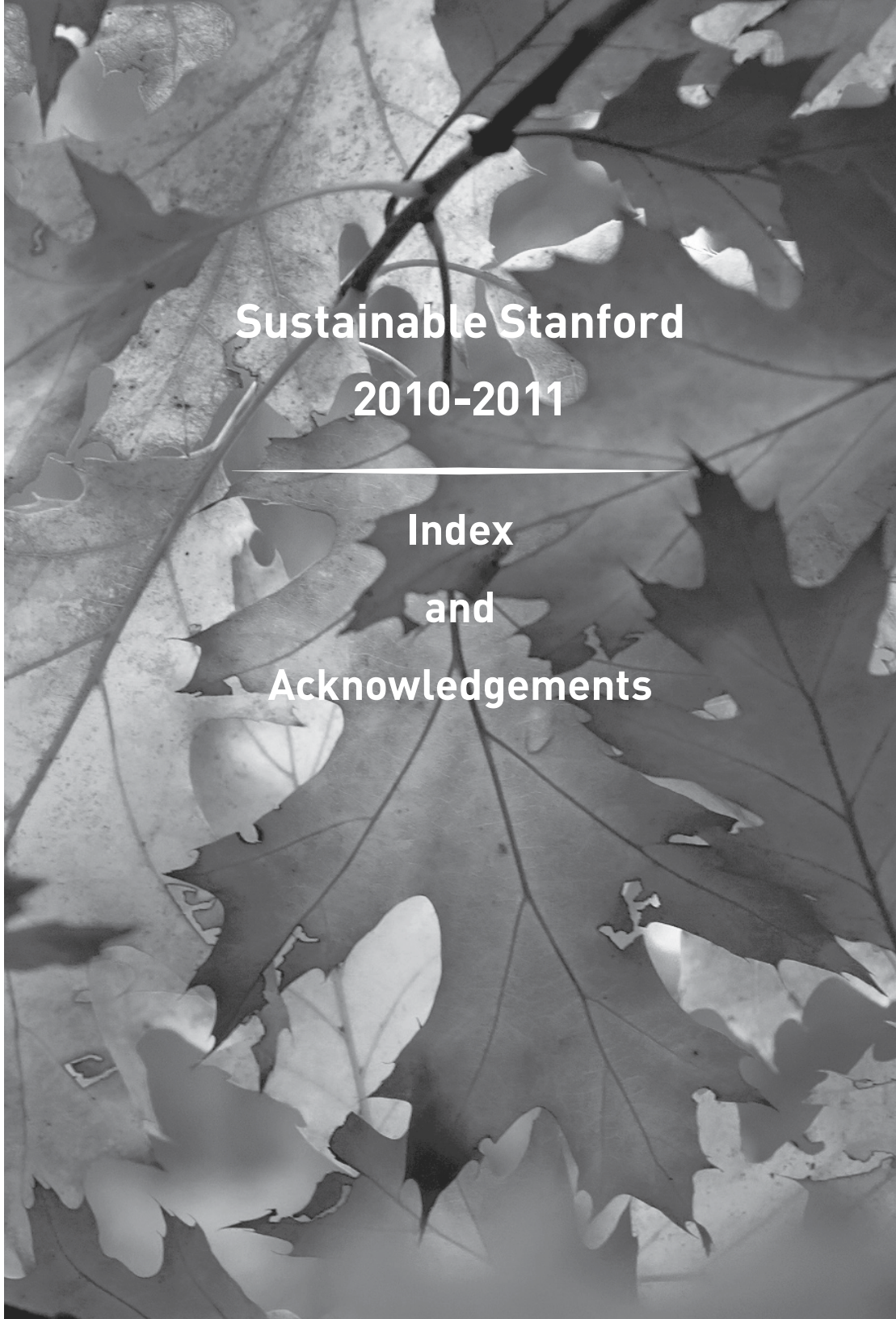
Water

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

Clean Bay Business Award, for the Stanford Golf Course Maintenance Shop and the Fleet Garage and Service Station, Palo Alto Regional Water Quality Control Plant (2001–2011)

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

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



Sustainable Stanford 2010-2011

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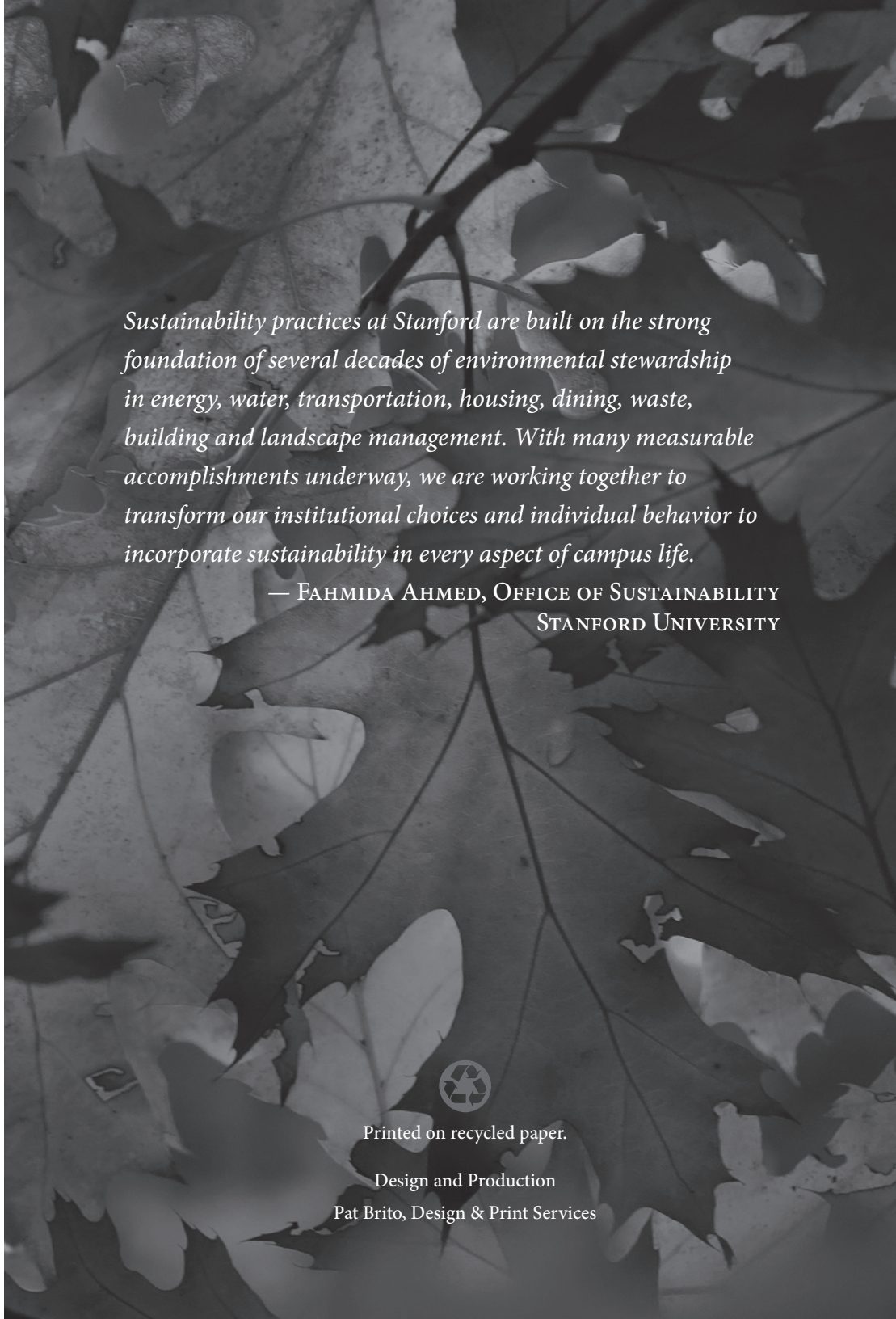
ACKNOWLEDGEMENTS

The Office of Sustainability gratefully acknowledges contributions from the following organizations to this publication:

- Associated Students of Stanford University
- Buildings & Grounds Maintenance
- Graduate School of Business
- Green Alliance for Innovative Action
- Green Living Council
- Heritage Services
- Information Technology Services
- Land Use and Environmental Planning
- Peninsula Sanitary Service, Inc.
- Precourt Institute for Energy
- Project Management
- Residential & Dining Enterprises
- School of Earth Sciences
- School of Medicine
- Stanford Alumni Association
- Stanford Solar and Wind Energy Project
- Students for Sustainable Stanford
- Sustainability and Energy Management
- Undergraduate Advising and Research
- University Architect / Campus Planning and Design
- University Communications
- Vice Provost for Graduate Education
- Woods Institute for the Environment
- Zone Management

PHOTO CREDITS

L.A. Cicero / Stanford News Service (pages iii, 44, 49, 53, 60, 83, 84, 90); Michael C. Chen, Office of Sustainability, Facilities Energy Management; Chester Manuel, Department of Project Management; Woods Institute for the Environment; Residential & Dining Enterprises; Students for a Sustainable Stanford; Green Living Council; Stanford Solar and Wind Energy Project; Campus Garden Initiative; Parking & Transportation Services; Precourt Institute for Energy; Tim Griffith / Courtesy Stanford News Service (pages 47 & 59); Department of Athletics; Peninsula Sanitary Services, Inc.; Vice Provost for Undergraduate Education; Green Event Consulting; Stanford Energy Club; Zone Management; and Jennifer Brito.



Sustainability practices at Stanford are built on the strong foundation of several decades of environmental stewardship in energy, water, transportation, housing, dining, waste, building and landscape management. With many measurable accomplishments underway, we are working together to transform our institutional choices and individual behavior to incorporate sustainability in every aspect of campus life.

— Fahmida Ahmed, Office of Sustainability
Stanford University

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Design and Production
Pat Brito, Design & Print Services

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

—Albert Einstein

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