



ISCN
International Sustainable Campus Network

JANUARY 2013 UPDATE

on the

INTERNATIONAL SUSTAINABLE
CAMPUS NETWORK (ISCN)

and the

ISCN-GULF SUSTAINABLE CAMPUS CHARTER



Executive Summary

In the 2012/2013 program cycle, the ISCN has focused on strengthening international collaboration by inviting new universities to join in experience exchange on the three ISCN-GULF Charter Principle areas: the sustainability impacts of campus buildings; campus-wide planning and sustainability target-setting; and the integration of research, teaching, facilities, and outreach into a living laboratory for sustainability. **New members** that have endorsed the ISCN-GULF Charter include:

Aalto University	University Ca' Foscari Venezia
Cyprus University of Technology	University of Cape Town
Eindhoven University of Technology	University of Melbourne
Nanyang Technological University	University of Oregon
Stanford University	University of Western Australia
University of British Columbia	

The ISCN provides our members the opportunity to share their achievements in campus sustainability via Charter Reports on the ISCN website, which receives around 3,500 views per month. Copies of Charter Reports submitted since February 2012 have been made available to the participants of the January 2013 GULF session. To complement the more detailed Charter Reports, ISCN-GULF Charter Members have also prepared *ISCN Signature Projects* for 2013. These short summaries serve as inspirational examples of leading sustainability initiatives, in an easy-to-read format for a broader audience. Signature Project summaries received to-date are provided on following pages.

In addition, to support discussions at the current GULF session on New Developments in Online Communication, ISCN member institutions were asked to share ideas about **sustainability topics suitable for Massive Open Online Courses (MOOCs) and similar instruments**, with suggestions made by EPFL, Harvard, MIT, and Yale including:

Solid sustainability fundamentals: renewable energy options, urban and integrated design, history and current developments in sustainable development

Sustainability expertise: energy and GHG modeling, design for sustainability, system dynamics and change management

Interconnections and trade-offs: links between environmental change and social justice, balancing climate change mitigation and adaptation

Following up on the ISCN Conference 2012 at the University of Oregon, the Secretariat is preparing the next **upcoming ISCN Conferences** with the host schools:

National University of Singapore (2013) and Harvard University (2014).

ISCN Signature Projects 2013 Received To-Date

<i>Institution</i>	<i>Signature Project</i>
Brown University	Dorm Energy Efficiency Program ("DEEP")
Carnegie Mellon University	Post-Consumer Food Composting
École Polytechnique Fédérale de Lausanne	Sharing Sustainable Mobility
ETH Zurich	"Anergy" Grid Replaces Fossil Fuels
Georgetown University	District of Columbia Mayor's College and University Sustainability Pledge (CUSP)
Harvard University	Green Building Standards
Massachusetts Institute of Technology	MIT Efficiency Forward
National University of Singapore	University Town : A Sustainably-Built Precinct
Stanford University	Stanford Energy System Innovations
University of Tokyo	Drastic Electricity Peak Cut-off after the Great East Japan Earthquake of 2011
Yale University	Yale Sustainability Strategic Plan 2010-2013

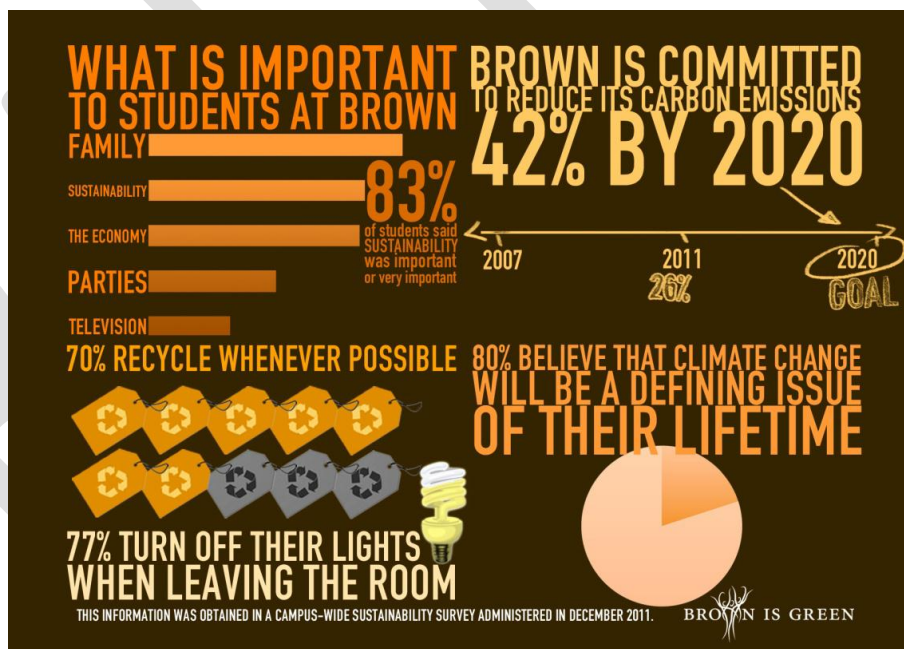
Project Title: Dorm Energy Efficiency Program (“DEEP”)

By combining infrastructure improvements and behavioral programs in dorms, Brown's DEEP project resulted in a 58% reduction in thermal energy use and a 16% reduction in electricity consumption.

Project Overview: In the spring of 2011, Brown began a pilot program using an integrated approach to improve energy efficiency in its residence halls. During the Dorm Energy Efficiency Program (DEEP) pilot, Facilities Management provided efficiency upgrades to a dorm while simultaneously educating residents about the personal choices they can make to save energy. DEEP has three parallel goals: 1) to reduce energy consumption, while 2) increasing student comfort, and 3) providing students with skills to help them live sustainably.

The pilot was a clear success. Retrofit measures in Diman House (pilot dorm) included LED lighting and building envelope improvements, resulting in a 58% reduction in thermal energy use and a 16% reduction in electricity consumption.

Together with the student EcoReps, the team developed an outreach plan to increase pro-environmental behaviors of the residents, such as keeping windows closed when the heat is on and using individual heat controls. An awareness and attitudes survey was also conducted to set a baseline for future projects.



Lessons Learned: Facilities is planning to continue this work by expanding the infrastructure improvements across campus and conducting more controlled studies on the effectiveness of the behavioral outreach campaign on energy savings.

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Project Title: Post-Consumer Food Composting

Starting July 1, 2012, an expanded post-consumer food composting program was rolled out in departments and food service areas because we added language to our Custodial RFP to include this service.

Project Overview:

Food composting collection bins have been placed in 12 areas on campus to departments that have subscribed to the new service. We have also started a pilot program in a dining area to collect post-consumer food and composting.

Prior to this new service being added to the Custodial Contract, food composting was removed by volunteers at each event or department. Being a voluntary program limited the number of events and departments composting.

While Carnegie Mellon did compost 402 tons of food in 2012, we are encouraged that this new service will increase our opportunity to compost organic waste and further engage our campus community.

Lessons Learned:

When our new Custodial RFP was written, Composting Collection was included in the language of the Recycling & Sustainability Section. "Composting Collection: The University routinely conducts Zero Waste Meals in several academic buildings and the University Center, in which all waste is composted. Upon the conclusion of each meal, the Contractor will be responsible for collecting and transporting all pre-segregated composted materials to one of several composting collection locations on campus. A schedule of Zero Waste Meals will be provided to Contractor on an ongoing basis. The number of Zero Waste Meals and corresponding number of weekly hours required will vary throughout the year from 0 – 5 hours per week."



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Project Title: **Sharing Sustainable Mobility**

Distributed information systems contribute significantly to the development of new forms of shared mobility and enable the deployment of innovative strategies for sustainable transportation.

Project Overview: For several years, EPFL has been exploring vehicle sharing systems. After replacing its car fleet in collaboration with the car-sharing "Mobility" Cooperative and deploying 9 free bike-sharing stations across the campus, in late January 2013 EPFL will launch a second car-sharing network including 7 stations with 2 electric vehicles each. These cars will be made available to students, staff, visitors and the public alike.

A convergence of information systems allows everyone to use their personal identification card to access these services, and reinforces the use of combined transport. Through web-based services and smartphone applications, students and staff enjoy a variety of customized solutions for their daily commute or the occasional trip, without the need for a private car.



3 shared mobility services are available for EPFL students and staff:

1. 15 conventional passenger cars provided by the Swiss Cooperative "Mobility car sharing" (since 2005)
2. 120 bicycles as a free service provided by the Swiss company Velopass (since 2009)
3. 14 "Electriceasy" electric cars provided by the company Tellis (end of January 2013)

Lessons Learned: Current RFID technologies allow our university to operate a wide range of services (access, electronic banking, catering, information), and now a promising step towards intermodal transport solutions, ranging from public transport to sharing individual vehicles. Each campus can adapt such solutions to its own situation.

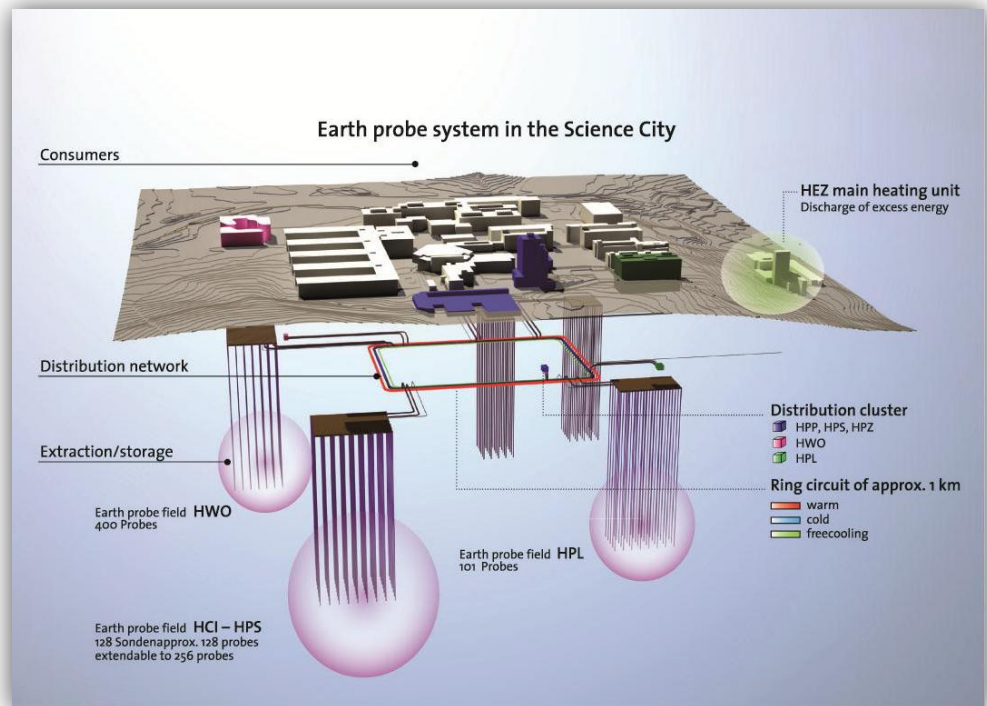
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Project Title: “Anergy” Grid Replaces Fossil Fuels

With the implementation of the new “Anergy” grid infrastructure at its Science City campus, ETH Zurich lays the foundation for substantial CO₂ emission reduction (50% by 2020) and will replace all fossil fuel-based heating by 2025.

Project Overview:

Thermal energy is most “valuable” when the energy-storing medium is much hotter or colder than its surroundings. If the temperature difference is small, the stored energy is harder to convert into other energy forms or to store over time. This less “valuable” energy is also called “anergy,” and much of waste heat is in that form. A [novel energy concept](#) allows ETH Zurich to use this anergy both for heating and cooling, which makes it economically attractive. In winter, heating energy is retrieved from several underground storage systems consisting of hundreds of earth probes. This cools the storages. Their lower temperatures can then be used for cooling buildings during summer, which warms up the storages again. A kilometer-long circuit of water pipes for heating and cooling links all buildings on the Science City campus into one connected thermal energy grid.



Lessons Learned:

While thermal grids can be very effective applications in areas with high energy density, the construction of such a new infrastructure takes decades to complete. It thus needs strong motivation and continuous support over a long timeframe. Transparent internal communication and institutional commitment are vital for such a project. It helps to divide the whole endeavor into several sub-project stages to simplify planning and to provide opportunities to clearly communicate the success of each stage.

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Project Title: District of Columbia Mayor's College and University Sustainability Pledge (CUSP)

Georgetown plays a key leadership role in the District of Columbia's (DC's) CUSP, the first collegiate & municipal partnership model of its kind in the country, promoting intentional collaboration between all colleges and universities based in the city and the local government toward achieving mutual sustainability goals.

Project Overview: In February 2012, Georgetown's President helped lead this university-based collaborative approach to sustainability, joining with Presidents of all nine campuses based in DC and the Mayor to sign the CUSP. This initiative, co-developed by participating institutions, recognizes the critical leadership role of colleges and universities in advancing sustainability in our community, reflecting



a shared intent among our campuses to engage in the Mayor's ambitious goal to make DC the 'Greenest College Town in America.' CUSP signatories pledged to:

1. Pursue selected sustainable actions right away.
2. Publish institutional sustainability plans within a year.
3. Designate staff for an on-going working group.
4. Report on progress in summer 2014.

Already, the CUSP has inspired new sustainability projects and fostered new community partnerships advancing sustainability across the sector. Accomplishments have included the creation of new strategic sustainability plans for member campuses; an ongoing forum for dialogue between municipal and campus sustainability staff; a new framework for pursuing collaborative projects with community partners; and a reporting tool to measure and share our sector-wide sustainability impact in areas of local priority.

Lessons Learned: Several key factors support the CUSP's success: First, successful sustainability pledge formats such as GULF-ISCN provided excellent models; second, the local geographic focus allows us to leverage and foster unique community assets and social capital; third, a focus on 'the city' provides a globally-replicable model for such collaboration, as cities are key functional areas for global sustainability work; fourth, the CUSP's intentional design ensures both flexibility and tangible impact, providing deadlines and advisement on strategic planning while avoiding prescriptive measures.

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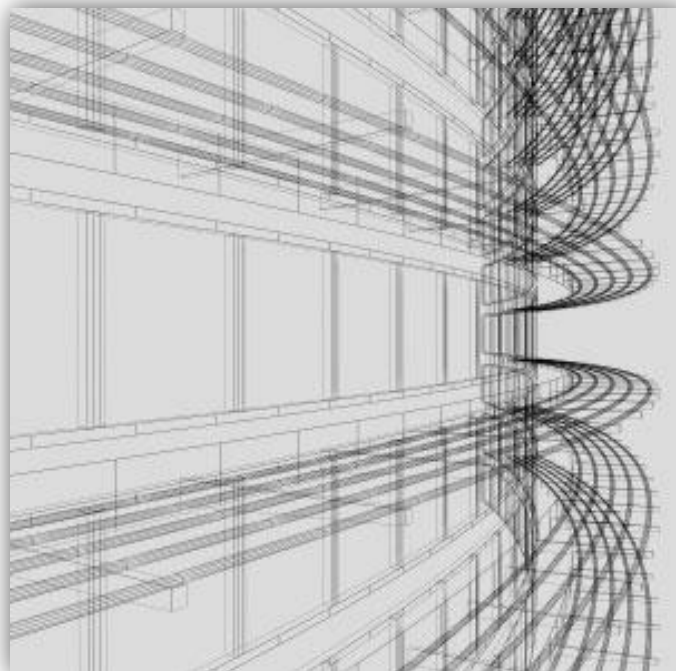
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Project Title: Green Building Standards

A multi-year, collaborative initiative led to the development of University-wide Green Building Standards for capital projects over \$100,000, and has positioned Harvard as a leader in green building and LEED certifications.

Project Overview: In 2009, Harvard University established [Green Building Standards](#) that apply to all capital projects over \$100,000. The Standards include process-oriented requirements to ensure that all sustainable design and operations opportunities are vetted and that performance requirements are achieved in a cost-effective manner. They include: integrated design goal-setting charrettes with all key stakeholders; multiple iterations of energy models; and life cycle cost analysis; as well as prescriptive requirements such as aggressive energy and water reduction targets. Additionally, LEED Gold certification is required for new construction and major renovations.

To support successful implementation of the Standards, Harvard developed a set of tools and resources including: The [Green Building Resource](#) knowledge sharing website with LEED case studies and documentation, a university-specific [Life Cycle Costing Calculator](#), [Green Loan Fund](#), and in-house [Green Building Services](#) consultant team. The Standards build upon the 2007 Green Building Guidelines that were based on project cost and which built a foundation for more comprehensive standards.



Lessons Learned: Several factors have contributed to the success of this initiative to institutionalize green building practices into capital projects, including: a collaborative decision-making process led by the Office for Sustainability and Green Building Services to develop and continually improve the standards, which sought feedback from a diverse range of stakeholders; development of knowledge-sharing resources, trainings and financial tools to support implementation; and an experienced internal green building consultant group that provides a full range of services and technical assistance to project teams.

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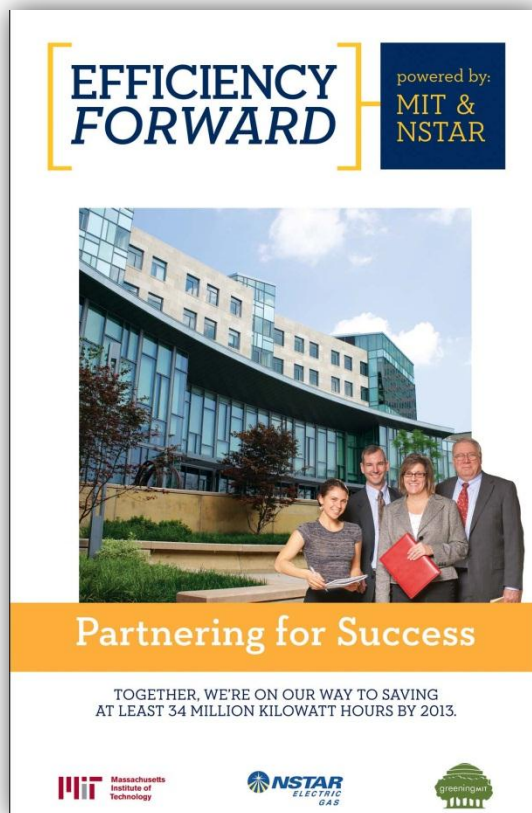
Project Title: MIT Efficiency Forward

MIT Efficiency Forward is a first-of-its-kind, multi-million dollar collaborative energy efficiency program with our local utility company that aims to reduce MIT's electricity use by 15%.

Project Overview: The MIT Efficiency Forward program is a ground-breaking, multi-million dollar collaborative energy conservation and efficiency program with our local investor-owned utility company NSTAR. MIT and NSTAR designed Efficiency Forward to create a new model for enhanced utility efficiency programs to support the Massachusetts Green Communities Act and the state's desire to make efficiency competitive with new source generation. This unique partnership is the single largest energy efficiency program NSTAR has developed with a customer. Over three years, MIT and NSTAR are investing nearly \$14 million to improve energy efficiency on campus. The program employs an innovative funding strategy that leverages funds from MIT, NSTAR incentive payments, and reinvestment of energy savings. MIT has committed to a goal of reducing annual electrical use on campus by 34 million kilowatt hours within three years equivalent to 15% of MIT's current electrical use.

The total estimated savings over the lifetime of the efficiency measures is in excess of \$50 million. In December 2012, the partnership concluded its third year of collaboration surpassing our total goal of achieving 34 million kWh of energy savings. The next phase of the Efficiency Forward program is under development.

Lessons Learned: By making a joint, long-term commitment to partner to implement energy measures and setting multi-year energy-use reduction targets, MIT has developed a portfolio of diverse projects, secured funding, provided organizational incentives, consistently measured progress, and implemented resources fully.



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Project Title: **University Town: A Sustainably-Built Precinct**

A new campus precinct adopts sustainable design principles such as land use planning, design of facilities, and harnessing of latest technology to minimize environmental impacts at the National University of Singapore (NUS).



Project Overview: University Town (UTown) is a new 19 hectare NUS development with residential colleges, research and teaching facilities, study areas, sports halls, computer laboratories and amenities. Sustainability principles were integrated throughout the project, including: preserving much of the site's natural topography, hydrology, and vegetation; choosing building locations and orientation to maximise natural cross ventilation into buildings and minimise solar heat gain; test-bedding "chilled beam" cooling technology and encouraging sustainable behaviour with an innovative "pay-as-you-use" system for air-conditioning in student residences. NUS was awarded Green Mark recognition for UTown as a whole and for all of its individual buildings.

Lessons Learned: Visionary leadership, long-term planning, and active collaboration between various university offices is critical to making UTown a landmark development for campus sustainability. The project's continuous effort to exceed existing building standards informs sustainability goals in future NUS infrastructure projects.

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Project Title: **Stanford Energy System Innovations**

The Stanford Energy System Innovations (SESI), centers around the creation of a first-of-its-kind energy facility that will be key to reducing the campus' carbon emissions by 50%, cutting water use by 18% and saving an estimated \$300 million over the next 35 years.

Project Overview: SESI makes use of an innovative heat recovery scheme. With significant and simultaneous need for both heating and cooling in its buildings throughout the year, the completion of SESI's heat recovery system (scheduled for 2015) will allow Stanford's campus to recover up to 70% of the waste heat now discharged from the cooling system to meet 80% of simultaneous heating demands, significantly reducing fossil fuel and water use in the process. The new heat-



recovery plant will be an all-electric, state-of-the-art plant featuring both hot- and cold-water thermal storage. The plant will be operated with a new automated control system invented at Stanford that will assure optimal operation through predictive economic dispatching. Once completed, the campus will have cut its current carbon emissions in half, reducing them to 50% below 1990 levels. This reduction in carbon emissions will be accompanied by a flexible and electricity-dependent energy supply system, offering higher reliability, lower cost and greater flexibility for greener power procurement, including renewable sources like wind or solar power.

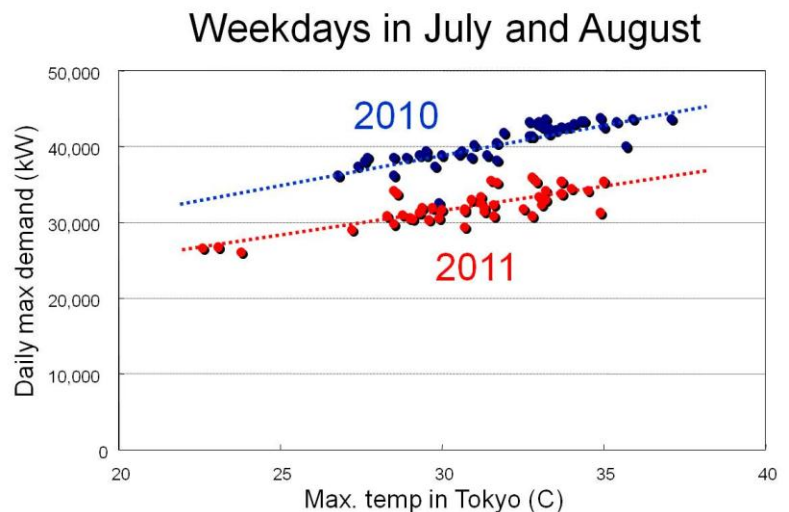
Lessons Learned: SESI's project design includes highly transferable technology and significant savings potential. The primary technical innovation of SESI is the district level application of heat recovery in a campus or municipal facility, which may apply to many organizations. Facilities in a moderate climate have the same heat recovery potential if the overall facility heating and cooling overlaps are diagnosed.

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Project Title: **Drastic Electricity Peak Cut-off after the Great East Japan Earthquake of 2011**

The University of Tokyo achieved reduction of peak electricity demand by 31% and electricity consumption by 23% against the previous year in summer 2011 when electricity supply was insufficient due to the Great East Japan Earthquake.

Project Overview: The Japanese government ordered large facilities including universities to reduce their peak electricity demand by 15%. The University was able to achieve this goal and demonstrate its commitment to society and sustainability, while maintaining a high level of education and research. A three-step strategy was developed including: 1. Electricity-saving initiatives; 2. Adjust working day/time; 3. Stop all air conditioners. Our target was 30% reduction in peak electricity demand and 25% reduction in total electricity



consumption in summer 2011. The expected reduction of demand peak was 32% by step one and additional 8% by step two. Energy reduction efforts for step one were to 1) change the operation of air-conditioners, 2) remove lamps, 3) prohibit non-experimental refrigerators, 4) disable heaters in washroom and kitchenettes, 6) use fewer elevators, 7) utilize computer energy-saving mode, 8) use laptops instead desktop computers and servers, 9) minimize the use of experimental equipment, 10) modify the running time of experiments, and 11) practice real-time energy conservation. The actual performance was a 31% reduction of peak demand (average value during working days) and 23% of total electricity consumption. Step one was sufficient in achieving the set targets.

Lessons Learned: Prior to the earthquake the University had been studying the energy-saving capacity of various equipment/fixtures. This proved valuable for estimating the amount of energy reduction which can be achieved by a particular action. This information was essential to develop a detailed action plan within a few months.

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Project Title: **Yale Sustainability Strategic Plan 2010-2013**

The Sustainability Strategic Plan 2010-2013 was developed to broaden and strengthen the foundation of Yale University's sustainability commitment. The plan consists of 43 university-wide goals and is organized around campus systems, administrative systems, earth systems, education and engagement. The 2014-2016 Strategic Plan will be released in July 2013.

Project Overview: The Sustainability Strategic Plan consists of a combination of quantitative, conceptual and project-based goals spanning all operational divisions at Yale. The plan has demonstrated our: commitment to continuous improvement, desire to assess and embrace new technologies and has acted as a catalyst for innovation in design and practice. The Office of Sustainability develops an annual public report to demonstrate progress over time.

Goals that have been achieved range from a commitment that all new major construction has been built and certified to at least LEED Gold since 2010; all buildings are now metered for water use; a sustainable transportation management plan and water management plan have been developed; a 25% recycled rate has been achieved while 99% of all food waste is now composted. There is great opportunity for educational engagement within each goal.

Lessons Learned: A commitment to a sustainable campus requires that all operational units engage in goal setting and measurement. The strategic plan has led to the creation of more efficient systems as measured by use [e.g. energy] or output [e.g. waste] and in some cases opportunities for cost savings [e.g. energy]. Yale now has methods in place to accurately track and report out on use and output related to operational systems such as energy and related emissions, water, waste, transportation and related costs. Yale's success into the future will require a commitment on the part of the university to not only departmental based goals but institutional level goals that the entire university is responsible for contributing to. Yale is a model in sustainability leadership as we hold ourselves accountable to achieving these publicly stated goals and committed to setting new goals every three years.

Sustainability Strategic Plan

2010–2013 Creating a sustainable campus to educate the leaders of tomorrow requires the flexibility to practice new behaviors, enable innovative strategies, embrace promising new technologies, and continuously seek new solutions over time. Success depends on the active contribution of every member of the Yale community.

recommendations of the yale university sustainability task force, september 2010

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The International Sustainable Campus Network (ISCN) provides a global forum to support leading colleges, universities, and corporate campuses in the exchange of information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching.

In addition to contributions from all ISCN Members, the ISCN Secretariat is generously hosted by:



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