FACT SHEET: SUSTAINABLE INFORMATION TECHNOLOGY

SUSTAINABILITY OPPORTUNITY

With energy use being the largest component of the sustainability and climate management picture, IT-specific energy management is a critical focus of the campus sustainability effort. Sustainable IT at Stanford is a joint effort between Sustainability and Energy Management and IT, enabling the initiative to take a holistic look at our computing infrastructure — both the machines themselves and the buildings they are in. Stanford University has a significant information technology infrastructure — faculty, staff, and students have approximately 35,000 computers on their desks and there are an estimated 6000 servers used for administrative and research computing across the university. When as much as 50% of the energy footprint of a server is the result of the cooling required to keep it running, factoring in facility savings is critical.

Opportunities to reduce energy usage through IT are substantial and within reach. From choosing smart power supplies and enabling desktop power management, to redesigning data centers and server rooms, the upfront costs of these efforts have a short return on investment in energy savings alone. Also, Stanford's leadership and leverage in IT innovation and implementation give the university an edge among peer institutions.

TOP INITIATIVES & RESULTS

Reducing Energy Usage through Computing Infrastructure

- **Desktop Computer Power Management** — In 2007, Stanford deployed the Big Fix Power Management tool that turns off computer monitors, one of the biggest users of energy, after 15 minutes. Desktop power management is enabled on over 7000 computers across the university.

- **Server Replacement, Consolidation, and Virtualization** — One of the most effective ways to reduce energy in the data center is to reduce the number of computers it takes to produce the same output. Replacing old hardware with new, more energy efficient hardware, consolidating under-utilized servers, and deploying server virtualization are all means to achieve this goal.

- **Centralized Data Storage** — Data that is stored in a central directory, rather then in local devices, saves energy by allowing us to manage storage capacity more effectively, as well as feature energy efficiency when selecting our storage alternatives.

- Hardware Lifecycle — With computers being replaced every 3-5 years, how we dispose of this hardware, and how we make decisions on which hardware to purchase, effects our impact on the environment. Stanford has joined the Climate Savers Initiative, and we are working with Procurement to ensure energy efficient servers are purchased when possible. For used equipment, Stanford has a reuse site where users can post hardware they no longer need, as well as an eWaste program to recycle all computer and telecom hardware.

Reducing Energy Usage through Facilities Infrastructure

- Measuring data center efficiency is a top focus for this initiative. We are putting the measurement tools in place to capture and track our data center Power Usage Efficiency (PUE); a metric that tracks how efficiently we are using energy in our data centers. Additionally, we are deploying wireless sensors and experimenting with floor plan layout, air flow, and other options to continue to drive down our PUE.

- Research Computing is high intensity computing used by our faculty for their research projects, and is one of the fastest growing users of energy on campus. We have designs for a new Research Computing

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Facility that will reduce energy usage by 80% and feature leading-edge technology to power and cool these high density servers.

■ Once we have data centers with highly efficient PUEs, we plan to work with schools and departments across the university to ensure their servers are located in the most energy efficient locations.

Using IT to Support Energy-Saving Work Practices

■ Our Information and Communications Infrastructure can be used to enable work practices that save energy in themselves. The university has efforts underway to develop platforms for telepresence, thin clients, and remote offices.

PROMOTING AWARENESS

■ Stanford provides education about sustainable IT practices through a cross-university working group called Sustainable IT, as well as through a broader e-mail distribution list and workspace for the university at http://its.stanford.edu/wiki/sustainableit.

■ Stanford led the Green IT forum at Educause in 2008 and is the founding school for the Educause Sustainable IT Constituent and Discussion Group.

AWARDS

■ Forsythe Temperature sensor project selected for Silicon Valley Leadership Group's (SVLG) Energy Watch Program, 2008

■ Stanford invited to join the U.S. Department of Energy's Vision & Roadmap workshop on Routing Telecom and Data Centers Toward Efficient Energy Use, 2008

■ Stanford selected to the Educause IT Greening & Sustainability Summit, 2008

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