

How Green is (O)IT?

A status report on OIT's contributions to NC State's sustainability efforts, fall 2009

Executive Summary

NC State's Office of Information Technology (OIT) can take pride in the way our systems and services contribute to the university's commitments to be a leader in environmental sustainability and to achieve climate neutrality. OIT's information and communication technology (ICT) and high-performance computing (HPC) services reduce the need for transportation, fossil fuel and paper use. These services enable distance education and telework, and they increase the campus capacity to do research and development in fields critical to addressing climate change. OIT provides ICT capabilities that support the social, economic and environmental aspects of NC State's concept of a [sustainable campus](#).

The issue of power used by ICT needs to be addressed campus-wide, however, especially in terms of how it impacts the university's carbon footprint and commitments to environmental sustainability. According to the 2008 [NC State Green House Gas \(GHG\) Inventory](#), electricity purchases account for 53% of the GHG emissions associated with the campus. Based on estimates from EDUCAUSE on the typical patterns of power consumption on campuses, a large portion of this footprint is likely from ICT. Although ignored until recently in most discussions of sustainability, the power used by NC State's ICT, including desktop and laptop computers, printers, data centers, and underlying ICT infrastructure, adds tons (perhaps more than 71,000 metric tons) of carbon emissions annually to the global environment.

In fall 2009, NC State Sustainability Officer Jack Colby called on OIT to become more involved in the growing number of campus sustainability initiatives. As a first step, the OIT Leadership Team requested a preliminary report on what is currently known about the environmental impact of OIT; current OIT green IT efforts; accepted metrics of ICT impacts; and possible improvements. This report is the result of that request.

The following chart is adapted from the EDUCAUSE 2009 research paper "[Getting Serious About Sustainable IT: Metrics, Tools, and Solutions](#)." It lists recommended green IT initiatives ranked by the expected cost and carbon-reduction benefits. The right-hand column summarizes the status of OIT and NC State's efforts.

“Carbon Reduction and Cost Factors in Green IT Initiatives “:

	Green IT Considerations	OIT/NC State status, fall 2009
High Carbon Reduction Low Cost	<p>Data center temperature</p> <p>Server rack blanking panel</p> <p>Power distribution units</p> <p>Hardware decommissioning</p> <p>Teleworking</p> <p>Business Travel reductions</p> <p>EPEAT/Energy Star purchasing (Note: servers, computers, monitors, printers are now all EPEAT and/or Energy Star rated)</p> <p>Power management (PM)</p>	<p>-Already implemented</p> <p>-Not yet implemented</p> <p>-Not yet implemented</p> <p>-In progress in Data Center 1, including decommissioning of mainframe computer; workstation reduction in computer labs being investigated</p> <p>- Student E-mail Initiative’s outsourcing of student e-mail will move this service to more energy-efficient Google Apps servers</p> <p>-VPN, remote access and other services support telework campus wide; could be enhanced</p> <p>-In progress due to budget cuts</p> <p>-Not required campus-wide; OIT purchases and recommends EPEAT Gold-rated computers for labs and classrooms; could be facilitated as part of PC and Printer Contract Purchasing project and campus awareness campaigns; CEST Purchasing work group may develop Sustainability Purchasing Policy similar to UNC-CH</p> <p>-Not yet implemented on desktops campus-wide; HPC/VCL PM measures deployed; PM of desktops, laptops, monitors, printers could be improved as part of Desktop Management and Virtualization project; options for improved PM of data centers and equipment being investigated</p>
Low Carbon Reduction Low Cost	<p>Digital imaging</p> <p>Print management</p> <p>Lighting</p> <p>Recycling</p> <p>Extend hardware life cycle</p>	<p>-New document imaging system (Hershey) in progress (will greatly reduce paper-based processes; will not be “low cost”)</p> <p>-Paper waste being reduced due to budget reductions</p> <p>-Improvements led by Facilities</p> <p>-Efforts led by Waste Reduction and Recycling; computer reuse and recycling processes in place campus wide</p> <p>-Being implemented campus wide due to budget issues; appropriate strategy only if hardware is energy efficient</p>

	Green IT Considerations	OIT/NC State status, fall 2009
High Carbon Reduction High Cost	Data center air handling Videoconferencing Virtualization Storage consolidation Virtual desktops/thin clients Virtual labs Distance learning	-Not yet implemented -Efforts led by DELTA -Server virtualization in progress -In progress along with Centralized Storage Project -Evaluated as part of the Desktop Management and Virtualization project; not feasible as a campus-wide solution at NC State. -NC State's Virtual Computing Lab (VCL) is a national model -Efforts led by DELTA; more than 300 credit courses offered online

Additional green IT efforts proposed for OIT and NC State include:

- Include sustainability benefits as routine part of OIT planning and reporting
- Include energy impact as routine part of OIT project planning and reporting
- Consult with ICT energy experts to conduct a study that includes data centers and ICT infrastructure and makes recommendations for short and long-term improvements
- Install meters to monitor and capture information on power consumption in data centers
- Reduce the number of small server rooms in departments and colleges
- Strive for carbon neutrality in the Data Center 3 facility being planned for Centennial Campus
- Work with the Office of Sustainability to promote green IT best practices campus wide
- Begin OIT's active participation on the Campus Environmental Sustainability Team (CEST) Purchasing and Energy workgroups; help work on the upcoming NC State Sustainability Strategic Plan and Climate Action Plan.

To facilitate OIT's alignment with university efforts and initiatives, we used the same categories in the [How Green is \(O\)IT?](#) report as those used by NC State's Office of Sustainability, with an emphasis in our report on the "Purchasing" and "Energy" sections.

