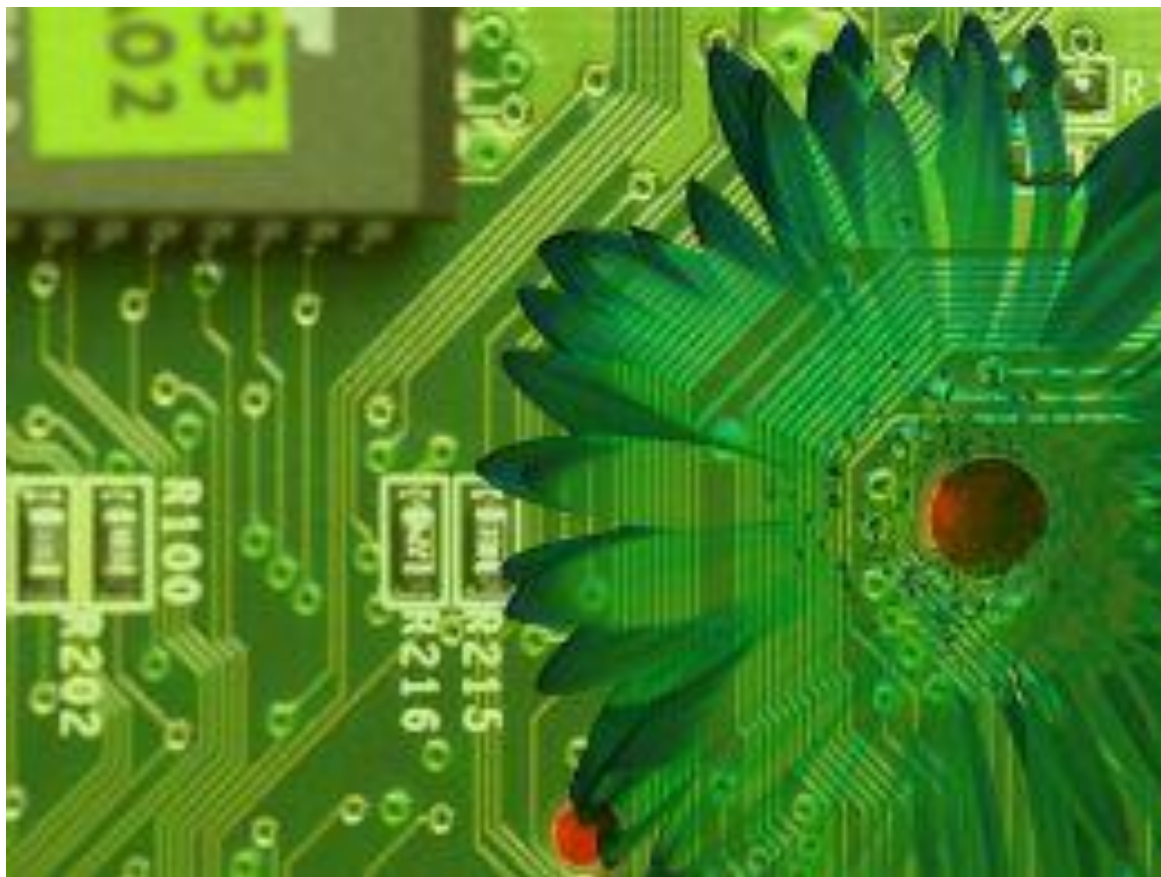




Sustainable Computing



Casey Roe
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Sustainable Duke
21 March 2012



Computing Trivia!

- Manufacturing a computer and monitor uses as much water, fossil fuels and chemicals as manufacturing which of the following:
 - A. A backpack
 - B. An SUV
 - C. 500 plastic bags
 - D. 7 cell phones



Computing Trivia!

- Manufacturing a computer and monitor uses as much water, fossil fuels and chemicals as manufacturing which of the following:
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Computing Trivia!

- The average PC wastes ____ percent of the power delivered to it.
 - A. 25%
 - B. 10%
 - C. 40%
 - D. 50%



Computing Trivia!

- The average PC wastes ____ percent of the power delivered to it.
 - A. 25%
 - B. 10%
 - C. 40%
 - D. 50%



Computing Trivia!

- What percentage of employed adults in the US do not turn off their computers at night?
 - A. 60%
 - B. 20%
 - C. 75%
 - D. 40%



Computing Trivia!

- What percentage of employed adults in the US do not turn off their computers at night?

A. 60%

B. 20%

C. 75%

D. 40%



Computing Trivia!

- How many trees does it take to absorb the annual impact of a computer left on 24 hours a day?
 - A. 20-60
 - B. 60-300
 - C. 300-500



Computing Trivia!

- How many trees does it take to absorb the annual impact of a computer left on 24 hours a day?

A. 20-60

B. 60-300

C. 300-500



Financial Implications

- At Duke
 - About 20,000 PCs
 - 5,300 servers
 - 5,100 printers and mobile devices
- Potential savings with very strict energy settings
 - About \$330,000 per year
- Makes financial sense



Energy Consumption





Electronic Waste (e-waste)





More Environmental Impacts

- Resource depletion
- Hazardous chemicals
 - Health impacts in production & disposal
- Climate change
- Global IT has as much impact as airline industry





Greening IT at Duke

- Carbon neutral by 2024
- Energy Star policy
- Consolidating servers into efficient data centers
- Educating staff
 - Power management
- Donating used computers
 - 1,500 donated last year
- E-waste recycling
- Telecommuting
- Phone & video conferencing
 - 55 rooms equipped



Power Management

- Strict energy management can reduce overall energy use of a typical workstation by up to 88%
- Sleep and hibernate modes can reduce energy consumption up to 60%



What actions can you take?

- Purchasing
 - Electronics
 - Paper
- Behavior
 - Energy conservation
 - Printing
 - Recycling & Reuse
 - Travel



What actions can you take?

- Purchasing electronics
 - EPA Energy Star
 - 15-25% more efficient
 - Recycled content
 - LED lighting
 - Replace large monitors with flat screens
 - Printers and copiers
 - Duplex capable
 - Automatic stand by features



What actions can you take?

ENERGY STAR - Windows Internet Explorer

http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

File Edit View Favorites Tools Help

OSCAR.com - 79... ENERGY STAR Sustainability @ ... Corporate Expre... http://www.vint...

energy
ENERGY STAR

BUY PRODUCTS THAT MAKE A DIFFERENCE
U.S. Environmental Protection Agency • U.S. Department of Energy

Products Home Improvement New Homes Buildings & Plants Partner Resources

Qualified Products Home > Products

Appliances
Heating & Cooling
Home Electronics
Lighting
Commercial Food Service
Office Equipment

• [Purchasing & Procurement](#)
• [Interested in Partnering?](#)

[Join ENERGY STAR](#)

ENERGY STAR Qualified Products
Products in more than 50 categories are eligible for the ENERGY STAR. They use less energy, save money, and help protect the environment. Ask for the ENERGY STAR.

If you're looking for a product that you don't see listed below, check out [new ENERGY STAR specifications in development](#).

Appliances

- [Battery Chargers](#)
- [Clothes Washers](#)
- [Dehumidifiers](#)
- [Dishwashers](#)
- [Refrigerators & Freezers](#)
- [Room AC](#)
- [Room Air Cleaners](#)
- [Water Coolers](#)


Heating & Cooling


- [Air-source Heat Pumps](#)
- [Boilers](#)
- [Central AC](#)
- [Ceiling Fans](#)
- [Dehumidifiers](#)
- [Furnaces](#)
- [Geothermal Heat Pumps](#)
- [Home Sealing \(Insulation\)](#)
- [Light Commercial](#)
- [Programmable Thermostats](#)
- [Room AC](#)
- [Ventilating Fans](#)

Home Envelope

[find a store](#)
[special offers](#)

Features


Heat Smartly with ENERGY STAR @ home


Take the ENERGY STAR Change a Light Pledge

Internet 100%



What actions can you take?

- Purchasing paper
 - High post-consumer content
 - Forest Stewardship Council Certified
 - Chlorine free
 - Unbleached



What actions can you take?

Corporate Express E-Way - Windows Internet Explorer

http://www.eway.com/ce/eway/ui?i=bulletin.b_view

File Edit View Favorites Tools Help

OSCAR.com - 79th Annual A... Corporate Express E-Way

Home | My Profile | Support | Log Off

STAPLES Advantage

Keyword Item Number

paper Search

Set Default Shopping List ~CEB Laser & Inkj... View

Cart Items: 0 Order #: NOT SAVED

Products Toner & Ink Orders Shopping Lists Approvals

Ordered Before My Company Ordered Before

Category

- Filing & Record Storage (3)
- Janitorial Supplies (2)
- Paper, Pads & Rolls (11)
- Pens, Pencils & Correction (4)
- Promotional Products (1)
- Toner, Ink & Ribbons (1)

Manufacturer

- Corporate Express Brands (1)
- Georgia Pacific (1)
- Badger Paper (3)
- Clover (1)
- Coast Paper (3)
- Gould Paper (4)
- Neenah Paper (1)
- NIB-National Industries for the Blind (1)
- Papermate (4)
- S&J Paper (3)

Ecooffice

- Environmentally Preferable EPA (14)
- Green Seal (4)
- Recycled (15)

Minority-Owned

EarthSaver 100% Recycled Paper, 90 Bright, 20 Lbs., 8.5"x14", White, 500/Ream \$6.88 / RM

Quantity Add To Cart

Corporate Express Brands - CEB8511RCY100 Add To List

GeoCycle 100Pct Recycled Copy Paper, 84 Brightness, 20#, Letter, White \$5.07 / RM

Quantity Add To Cart

Georgia Pacific - GEP998793 Add To List

Copy Paper, 20#, Letter, White, 500/Pack \$4.20 / PK

Quantity Add To Cart

Badger Paper - BAD550000108 Add To List

Paper, Classic/Environment, Premium, Ltr, 500/Rm \$10.45 / RM

Quantity Add To Cart

Neenah Paper - NEE05060 Add To List

Writing Pad, Perf-Top, 8-1/2"x14", White \$22.44 / DZ

Paper Mate® Anti-Microbial Flexrip Elite™ Ballpoint Pen, Refillable, Medium Point, Black Barrel/Ink, Dozen \$8.64 / DZ

Paper Mate® PhD® Ultra Ballpoint Pen, Retractable and Refillable, Ergonomic, Black Ink, Medium Point, Black \$3.49 / EA

Paper Mate® PhD® Ballpoint Pen/Pencil Combo, Ergonomic, Cushioned Grip, Black/Red Ink

Internet 100%



What actions can you take?

- Energy Conservation
 - Turn off equipment and lights
 - Computer, monitor, printer, speakers, etc
 - Check with IT
 - Phantom power
 - Powerstrip
 - Energy saving modes
 - Sleep, hibernate
 - No screen savers
 - Eliminate unnecessary equipment

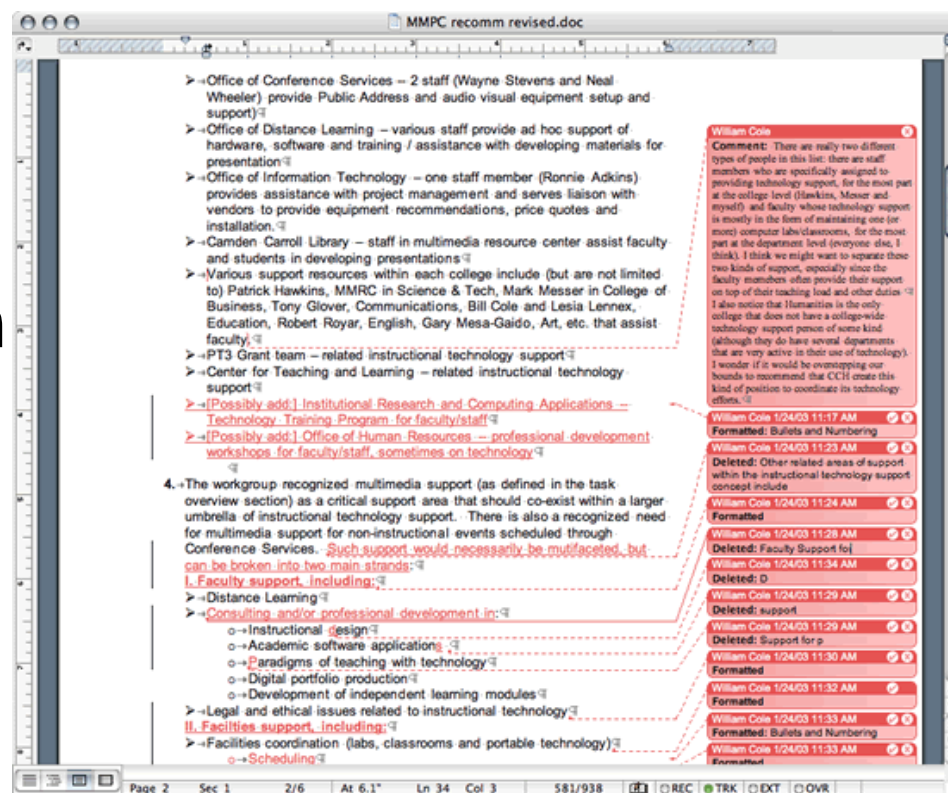




What actions can you take?

- Printing

- Default double-sided
- “One-side-used” bin
- Grayscale
- Narrow margins & small fonts
- Edit on computer





What actions can you take?

- Reuse, then Recycle
 - Recycling bins
 - Recycle toner cartridges
 - Recycle all e-waste
 - At Duke
 - Durham, Wake, Orange counties





What actions can you take?

The screenshot shows the Duke University Financial Services Procurement website. The browser window has multiple tabs open, including Gmail, Google Docs, and various Duke-related pages. The website's header includes the Duke logo and navigation links for Human Resources, Technology, Dining, Transportation, Stores, Facilities, Safety & Security, Finance, Campus Services, and Academic Services. A search bar is located in the top right corner.

The main content area is titled "Duke FINANCIAL SERVICES PROCUREMENT". On the left, there is a sidebar with navigation links: "How To Procure & Pay", "Purchasing Programs", "Green Purchasing", "Vendor Information", "Supplier Diversity", "Surplus And Storage Programs" (which is expanded to show "Online Tool Instructions", "Online Tool Instructions (Clinical Engineering)", and "Frequently Asked Questions"), "New Product Entry - Health System", "Product Issues & Recall Processes", "Training", "Forms", "News & Events", "Financial Services", and "Need Help?".

The main content area is titled "Surplus And Storage Programs". It contains the following text:

All surplus property, including computers, that were purchased with Duke funds or are considered Duke property must be processed through Surplus Property Asset Disposition Tool for tracking purposes.

Please review the [Instructional Guide to the Asset Disposition Tool](#).

To submit a surplus property pick up request, please visit the online [asset disposition tool](#).

Please reference the following documents for additional information:

- [Clinical Engineering, Research Equipment and Medical Surplus Property Disposal Requests](#)
- [Surplus Property General Accounting Procedure \(GAP\)](#)
- [Equipment Screen Forms](#)
- [Temporary Storage Solutions](#)
- [Frequently Asked Questions](#)

For information regarding Duke Global Health P.L.U.S. (Placement of Life-changing Usable Surplus), please visit the [Duke Global Health Institute website](#).

Surplus Property Donation Program

Good quality, surplus furniture and computers are available to Duke Departments at no charge through our Surplus Property Program. To request computers for Duke Departmental use or get a schedule of our upcoming furniture viewing/collection times, please email andrea.horn@duke.edu.

Contact Information

Craig Parker
Program Coordinator
Moving and Storage Program
(919) 684-3166
Craig.Parker@duke.edu

A large red arrow points from the right side of the page towards the "Surplus Property Pickup Request" section, which is highlighted with a blue box and contains the text: "All surplus property items (including computers) must be entered into the online [asset disposition tool](#). Pickup requests should be made as far in advance as possible - preferably one to two weeks. Clinical Engineering governed areas, research equipment and medical surplus have separate, [specific instructions](#). Please [review them](#) prior to scheduling a pickup if you are part of one of these areas."



What actions can you take?

- Travel
 - Telecommuting
 - Phone & video conferencing





Learn More

- Leading for Environmental Sustainability workshop
 - June 19, 8:30-11:30 a.m.





Questions?

Casey Roe
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919.660.1470

Recycling Questions?

Contact Arwen Buchholz
919.660.1426 office
919.697.0262 cell
arwen.buchholz@duke.edu