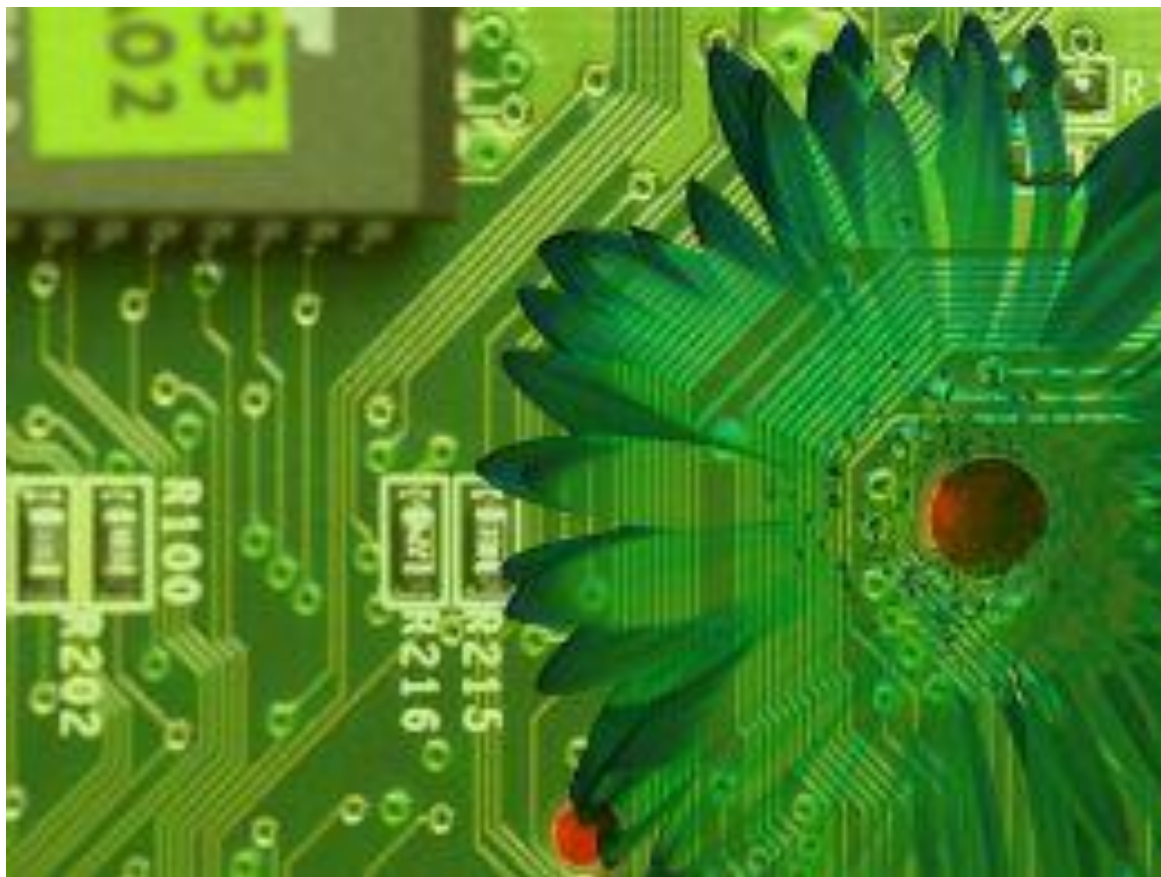# Sustainable Computing

Casey Roe
Outreach Coordinator
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

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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%

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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%

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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?

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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?

What actions can you take?

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

What actions can you take?

What actions can you take?

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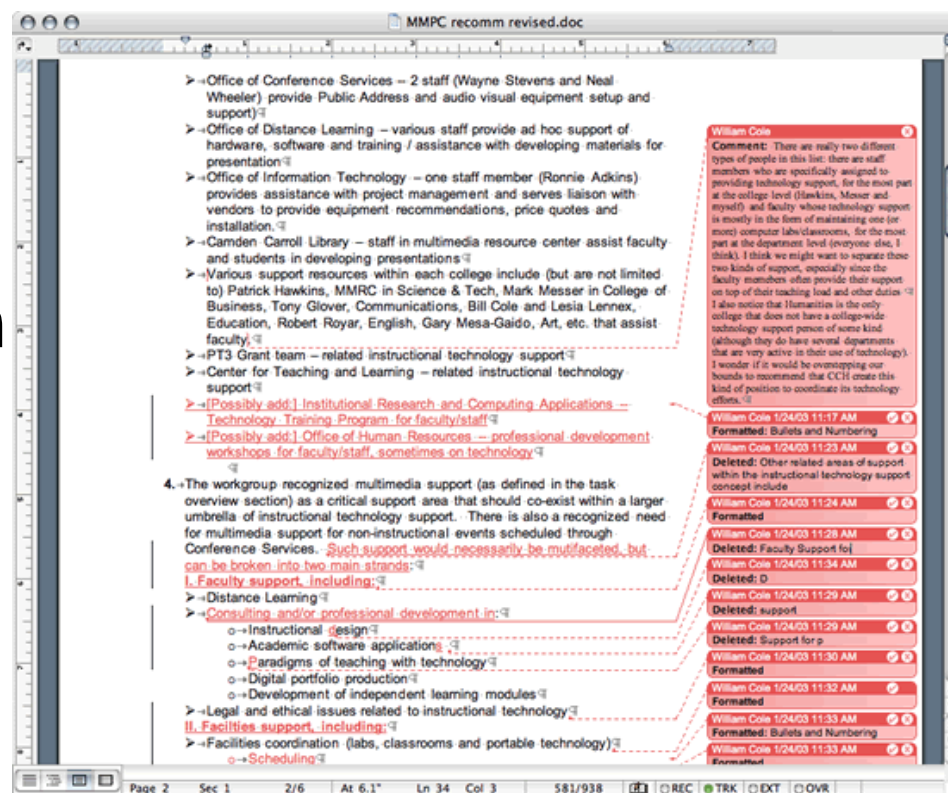 - Energy saving modes
    - Sleep, hibernate
    - No screen savers
  - Eliminate unnecessary equipment

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?

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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Recycling Questions?

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