

Sustainability Audit Report

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Space/Date Audited: Surplus/October 16, 2008

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Lighting

Observations:

- Typical fixtures are 4 lamp T8 fluorescent hanging, and 2 lamp T8 fluorescent recessed with opaque shield type diffusers.
- Lights were mostly off in unoccupied areas.
- Some bulbs were out in the warehouse.

Lighting Energy Usage			
Fixture Type	Quantity	Energy use per fixture	Watts per fixture type
1 lamp T12	1	34W	34
4 lamp T8	40	128W	5210
2 lamp T8	40	64W	2560
300W incandescent	2	300W	600

Recommendations:

- **Replace all incandescent and halogen bulbs with compact fluorescent (CFL) bulbs.** CFLs produce light much more efficiently than incandescent and halogen bulbs. CFLs also produce less heat, an important factor to consider during the summer months. CFLs come in a wide-range of spectra and intensities, so a suitable CFL can be found for almost any application.
- **Replace or remove burnt-out fluorescent lamps.** Unlike incandescent bulbs, burnt-out fluorescents still consume energy. If the light level in the area is adequate without the lamp lit, please email sustainability@oregonstate.edu for more information on delamping procedures. If the lamp has been out for more than two weeks and needs to be replaced, contact Facilities Services by email at FacilitiesCustomerServ@oregonstate.edu or by phone at 7-2969. Notes on specific areas with burnt-out bulbs are available upon request.

Computers and Peripherals

Observations:

- Some computers and monitors in unoccupied areas were on, including ~ 20 in the warehouse.
- Printers observed were on.
- Most computer peripherals (speakers, external hard drives etc) were on in unoccupied areas.

Office Equipment Energy Usage				
Equipment	Quantity	Energy consumption on	Energy consumption standby/sleep	Energy consumption off
Computer	6	65W	2W	0W
Liquid crystal display (LCD) monitor	6	35W	2W	0W
Misc. printers/copiers/faxes	2	19-1350W	5-48W	0W
Warehouse Computers & Monitors	~20	35-80W	2-15W	0W

Recommendations:

- **Institute a power saving mode on all monitors** that have been inactive for 10 minutes.
 - On most computers, power management options can be found under the Control Panel (from Start → Settings → Control Panel). Click 'Power Options'. Here you can designate when your monitor or computer should enter standby.
- **Turn off or standby computers at night** and have them enter standby when not in use for extended periods of time (one hour or longer).
 - Turning a computer on and off does not damage its hardware like it once did. Most hard disks are rated at 20,000 on/off cycles. If turned on/off once a day, it would take 55 years to reach this rating number.
- **Turn off printers at night (especially laser printers)** that typically are on all day. Laser printers consume considerable amounts of energy even while in standby mode; according to manufacturer's specifications, several laser printers inventoried during the audit consume over 80W while in standby. The average standby power draw is 37W. If high volume printing is not necessary, recommend that staff use inkjet printers, which typically use considerably less energy (<5W) when in standby.
- **Consider leaving computers for sale off when possible**, potentially saving up to \$250 per year.
- **Use a surge protector for computer peripherals and other accessories.** While many computer peripherals like speakers, scanners and external hard drives do not use very much energy (<5W),

the accumulated energy consumption is significant. By having them all plugged in to a surge protector, not only are they protected from fluctuations in current, they also can be easily shut off at night or during extended periods of downtime.

- **Use laptops in place of desktops when appropriate.** Laptops use considerably less energy than a desktop (20-30 W vs. 100-150 W) and do not require an uninterruptible power supply. A laptop docking station allows for desktop-like function while at work or at home while allowing the full portability required of a laptop.
- **Decrease time at which copiers and printer enters power-save mode to 15 minutes.**

Other Electrical Equipment

Observations:

- 1 small refrigerator and 1 regular size refrigerator, both mostly empty, were observed.
- 1 microwave, 1 coffeepot, and 1 fan were also noted. They were all unplugged.

Recommendations:

- **Plug accessories into a surge protector** so they can be easily shut off at night and on weekends. Many of the accessories listed above require a constant power supply to power displays and maintain system functions. While this phantom load is usually small for an individual piece of equipment, the aggregate power consumption can be surprising. A surge protector is a safe and convenient way to protect these devices while allowing the user a fast and simple way to shut them off when they are not in use.
- **Consolidate contents of small refrigerator into the regular sized refrigerator.** Small 'mini' refrigerators use between 200 to 300 kWh annually. With the amount of available space in the large refrigerator, it appeared that the mini is not necessary. If there are times when more space is necessary, the small fridge could always be plugged in only when needed. This could save up to \$15 annually.
- **Keep fridge at least one and a half inch away from the wall** (if possible) to allow for more efficient cooling. Placing a wood block on the floor behind the fridge would keep it from being pushed back against the wall. If this is improbable due to the size and location of the fridge, at least consider cleaning the coils in the back. This is another measure that can be undertaken every six months to increase efficiency.
- **Place jugs of water in fridge and blocks of ice in freezer** if units are consistently empty. Filling empty air space lessens the amount of warm air that needs to be cooled each time the fridge or freezer door opens.

Recycling

Observations:

- Paper and commingled recycling bins were present in various locations around the area.

Recommendations:

- **Ensure enough recycling bins are located to be convenient for all office occupants.** Ideally, a commingled recycle bin would be adjacent to every trashcan in a common area. For more information on recycling, please contact sustainability@oregonstate.edu.

Purchasing

Recommendations:

- **Consider Energy Star® products when replacing appliances and office equipment.** These products are typically 10-30% more efficient than non-rated models and the purchase price difference is oftentimes negligible.
- **Consider EPEAT™ -certified computers and accessories** when purchasing new equipment. EPEAT™ evaluates products on a wide-range of environmental criteria, ranging from energy consumption and materials to toxic content and end-of-life management.

Paper Use

Recommendations:

- **On all computers, set double-sided printing as the default setting for printers with this capability.**
- **Encourage printing on clean side of single-sided paper.** Add small boxes near printers containing this draft paper or leave a stack of this paper in printer bypass feeders.

Recommendation Summary

Recommended and Potential Energy Conservation Measures				
Conservation Measure	Annual Energy Savings	Annual Savings	Implementation Cost	Return on Investment
Replace all incandescent lights with CFLs. Estimated impact is 2 bulbs.	129 kWh	\$6.45	Avg. \$4/bulb; \$8 total	1.2 years
Turn off warehouse electronics when not in use. Estimated impact is 20 computers.	4493 kWh	\$224.67	0	Immediate
Enable standby modes on computers that typically run all day; estimated impact is 6 computers.	364 kWh	\$18.20	0	Immediate
Turn off all printers at night that typically run 24/7; estimated impact is 2 printers. Enable standby modes.	293 kWh	\$14.67	0	Immediate
Unplug (or use surge protector switch-off) all small office equipment (cell phone chargers, computer accessories, etc.) at night; estimated 25W total	219 kWh	\$10.95	Avg. \$3/power strip; \$12 total	1.1 years
Total savings if above changes are implemented	5499 kWh	\$275	\$20	.1 years

By implementing the changes listed above 10,998 lbs of CO₂¹, 14 lbs of SO₂² and 18 lbs of NO_x² will not be emitted into the environment each year.

1- PacifiCorp; 2 - Phil Carver, Oregon Department of Energy

If you have any questions or comments regarding the format, observations or recommendations of this energy audit, do not hesitate to write or call. We can be reached at sustainability@oregonstate.edu or 7-3307. Other staff or departments interested in receiving a Sustainability Audit are also welcome to contact me at the email and phone number listed above. Thank you for your time and participation.

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Sustainability Office