

**2009 Annual Plans
Compiled Unit Responses to Energy Reduction**

Identify initiatives you have implemented within your unit since January 2008 that have directly resulted in energy reductions within your unit. Provide the date that the implemented change occurred.

Business Operations

1. Student Financial Services areas (Cashier's, Loans, and Student Receivables) managed the effort to physically remove approximately half of the light bulbs from the CO first floor office areas. In conjunction with this effort, management coordinated with DPPS to identify and relocate which lights remain left on continuously as necessary for after-hours security purposes. This significantly reduced the number of lights remained on 24/7. Date: 12/1/08.
2. All CO employees are provided the MSU Recycling progress reports on Electrical and Waste Reduction for the Administration building with the goal of identifying within the CO units energy conservation opportunities. Lighting downgrades and unplugging to reduce phantom energy use were the most common outcomes.
3. The Office of Financial & Cost Analysis implemented HVAC changes by the reduction of the number of running hours and locations of extended HVAC services during year end period of July & August. Date: 7/1/08.

Business Operations/Contract & Grant Administration

1. CGA has identified an environmental believer who keeps CGA apprised of many energy saving and recycling opportunities. CGA has also moved to 100% recycled paper for all but the Board of Trustees report.

Business Operations/University Services

1. Server Virtualization: Twenty-four servers were virtualized, producing energy savings from reduced power requirements to run the physical servers, and from decreased energy usage for cooling. University Services' goal is to virtualize its entire environment for a total of 35 virtualized machines. Calculated savings for the twenty-four servers are 158,856 kWh.
 - a. Reference www.vmware.com/ - Green Calculator. Assuming costs of \$0.10/kWh and 550 Watts per 2 CPU server, the dollar savings are about \$15,885.58 annually. The environmental impact can be compared to planting 480 trees, removing 36 cars from the highway, or cutting CO2 emissions by 213,026 pounds per 96,627 kg.
2. Office Energy: The goal of Accounts Payable is to reduce paper consumption. University Services Administrative computers (Purchasing Building) are using energy reduction power strips. With the installation of the new Angell Building security system, operating hours are being streamlined, resulting in decreased lighting and computer usage.
3. Fleet: One vehicle was eliminated from the fleet. Two new vehicle replacements which will be more energy efficient will occur in 2009 and 2010. Engine idling reductions support environmental stewardship.

Campus Planning & Administration

1. The GIS Office has been heavily involved in the environmental stewardship program from near its inception. In July 2008, the GIS Office moved from 414 Olds Hall into remodeled space in 412 Olds Hall. This move has allowed for better interaction with the other staff within Campus Planning and Administration and has provided a quality environment for completing work related tasks. In addition, the move has helped the GIS office reduce the amount of energy used on a daily basis by using individual desk lighting as opposed to overhead lighting. We also have the ability to disable our locally installed HVAC system when it is not needed.
2. The GIS Office has been in the process of upgrading its servers for the past year and has changed to a virtualized environment for many of the low throughput operations. We previously had three servers whose roles included identity management, source code control, email, and data. The three servers have been replaced by a single server. Implementation was completed in July 2008.
3. Eventually, Skire will reduce paper records which, in turn, will reduce the requirement to transmit and store these documents in a physical form. At this point, we have not realized meaningful reduction, as relatively few projects are in the system, and a good deal of paper is used to create the electronic system.

Campus Sustainability

1. Our green renovation emphasized energy reduction. All electrical devices are plugged into power strips that allow us to turn off when we leave the office. Certain items are only turned on when used and then turned off and/or unplugged – coffee brewer, microwave, refrigerator. We installed a ceiling fan to reduce the need for air conditioning. We use day lighting most of the time. When we do use artificial light we use task lighting with compact fluorescents rather than overhead lighting. In the director's space this is a 98% savings. All machines are Energy Star rated, power management systems are set to power down after 15 minutes of use. We bought refurbished laptop computers, that are Gold Rated EPEAT machines and saved \$400 over the brand new price.

Environmental Health and Safety

1. January 2008 biological safety office began encouraging all employees to walk to campus meetings instead of driving university owned vehicles, since they are centrally located in Giltner Hall.
2. May 2008 employees organized a 5 day a week carpool to the Detroit area.
3. May 2008 replaced several computers with new energy star, flat screen monitor, models, and institute procedures to turn computers off when not in use for extended periods.
4. June 2008 replaced a Hazardous Waste Hauling vehicle with a new biodiesel model, Vehicle #1240.
5. June 2008 Environmental team purchased an electronic golf cart to drive to campus meetings instead of a University owned vehicle.
6. July 2008 requirement that all office furniture must be purchased at University Surplus if available.
7. August 2008 Encourage employees to teleconference and participate in webinars instead of traveling.
8. August 2008 Converted to all recycled office products and consumables when available. (including office furniture)
9. September 2008 Replace ORCBS Director's vehicle with Hybrid, Vehicle #K220.
10. September 2008 Instituted a new flexible scheduling policy with all full-time employees to allow individuals to carpool and reduce their number of days traveled to work (working four 10-hour days).
11. October 2008 biological safety office purchased reusable dinnerware and eliminated the need for disposable cups, silverware, and plates.
12. December 2008 replaced a Hazardous Waste Hauling vehicle with a new biodiesel model, Vehicle #1266.
13. December 2008 replaced letterhead paper with electronic letterhead.

Housing & Food Services

1. Kellogg Center and the MSU Union continue to monitor HVAC and lighting opportunities.
2. Developed and followed the HFS HVAC Policy that was developed Fall 2008 in accordance with MSU Policy.
3. Right-sizing bookings and utilizing space that supports the amount of people the room holds has assisted in energy management.
4. Total energy reduction in residence halls was over 10%.
5. In Wonders and Case a large amount of the electrical consumption change was due to the change out of light fixtures to new energy efficient fixtures, new ballasts from T12 to T8 fixtures. 80% of the light fixtures in Wonders public areas were changed.
6. Case installed hundreds of compact bulbs into old light fixtures.
7. Wonders tightened up the use of the Kiva for groups. Small groups were diverted to small areas for bookings. Right-sizing bookings have helped reduce energy costs. South Complex is a very active area with many space use demands.
8. Overall, South Complex reduced their energy usage by a combined 27% last year (four halls); each hall has a 6 – 8% energy savings. The prior year South Saved 10% across the complex. Also based on GIS we had a 7% reduction in Wonders through June 2008.
9. Over the past nine months, Brody Complex has made the following changes that affect energy and water consumption: 32-8' T-12 fixtures were converted to 24-4' T-8 fixtures in Rather and Bryan sidewells.
10. 72 study lounge light fixtures were converted from T-12 to T-8 fixtures in Bryan Hall.
11. 42 T-12 to T-8 student room, hallway, and community bathroom lights were converted in the new Brody Office wing of Butterfield Hall.
12. Replaced 30 T-30 bathroom lights with 30 T-8 units.
13. All incandescent lights removed and replaced with compact fluorescents in the crawl spaces and storage rooms of all seven Brody Complex buildings. 532 fixtures. Each of these bulb changes results in a savings of 51 watts.
14. 35 window air conditioners were replaced in Butterfield Hall with energy star units.
15. In Bryan Hall community bathrooms; 16 continual fill tanks that serviced 44 urinals were removed and replaced with 17 1/8 gallon flush urinals. We anticipate a water savings of 12.5 million gallons annually.
16. In Armstrong Hall community bathrooms; 11 continual fill tanks that services 26 urinals were removed and replaced with 3 1/8 gallon flush urinals. This should result in an anticipated savings at 8.7 million gallons annually. More change-outs are planned in the future in Bailey Hall.
17. Summer of 2008 East Complex converted 1500 incandescent light bulbs to compact fluorescents in student room bathrooms in Akers Hall and student rooms in Holmes Hall.

Human Resources

1. MSU Human Resources regularly reminds staff throughout the building of ways to save energy such as shutting computers off at the end of the day, unplugging appliances that are not in use and turning off lights when leaving offices for meetings. We have appointed an environmental steward for our office that seeks out opportunities and assists in reminding staff members of the role they can play in saving energy. According to the Building Complex Electrical Use Reduction Report, the Nisbet Building which houses Human Resources is making good progress toward our energy reduction goals. The report indicates that we achieved a 30 percent reduction to date.

Internal Audit

1. Internal Audit expanded use of electronic reporting to include all audit reports sent to Plante & Moran, effective May 2008. Electronic workpapers were implemented in July 2008 reducing the volume of paper used.
2. In 2008, Internal Audit reemphasized the importance of turning off personal computers at night as well as turning off lights when leaving the office. Thermostats have also been turned down both during the day and particularly in the evening and over weekends. This was specifically discussed in staff meetings in September and October, 2008.
3. Internal Audit has continued to focus on recycling with bins located both within the department as well as the hall. In addition, confidential recycling/shred bins were used in 2008 to dispose of large volumes of confidential data. Also, we continue to use the preferred recycled paper and recycle toner cartridges. Canned pop is brought on a staff volunteer basis with responsibility for obtaining can return deposits.
4. Staff have been instructed to set their print preferences to duplex to ensure two-sided copies are made.

Land Management

1. The design of the Demmer Shooting Sports Education and Training Center was modified specifically to reduce HVAC needs
2. Engine idling reduction is being emphasized on all farms
3. Lights and equipment are turned off when not in use
4. Tractors on south campus have been reduced by two and units are encouraged to share equipment
5. Environmental stewardships meetings have been held for south-campus farm managers
6. Water conservation plans have been implemented for irrigation
7. Walking to meetings is encouraged for the Land Management Office staff

Land Management/Hidden Lake Gardens

1. Replaced boiler in the Maintenance Building

Libraries, Computing and Technology

1. High Performance Computing Center continues to use "floating point operations per second per BTU" as a bid spec for new hardware; new cluster systems have made it to the top-50 list of "green supercomputers" from time to time
2. AIS and ATS server virtualization projects underway; this will convert multiple small independent servers to a large-scale standardized virtualized architecture, which is anticipated to reduce overall power consumption; old physical-server to new virtualized physical machine "compression" ratios typically are 4-1 to 10-1; ATS has one 100-1 example (services previously supported by 100 old servers now running on one physical machine in virtualized environment); virtualization now about 25% complete
3. LCT Training Programs – More courses moved online each year; course materials increasingly put online in place of printed materials
4. Continued deployment of Crestron room control units to technology classrooms has reduced trouble calls from these rooms almost to zero, eliminating the economic and environmental costs of "trouble truck" responses, and reducing inadvertent projector use

Physical Plant

1. Reduced HVAC running times in Physical Plant facilities, which began
2. Installation of variable frequency drives (VFDs) on exhaust fans at the power plant.
3. Beginning December 2008, Telecom began to implement the practice of vehicle-pooling amongst technicians assigned to work in the same location when it is practical to do so.
4. Beginning in January 2009 Power and Water replaced its departmental metering vehicle with a hybrid.

5. Business and Personnel is moving toward server access for remote telecommuting, with minimal computer run time.
6. The Physical Plant Environmental Steward Team continues to share energy and waste reduction messages with the Division. Starting in January 2009, the team plans to meet regularly to share ideas and work together better to cover the Division.

MSU Police

1. Wall stickers were posted next to room exits and light switches reminding users to turn off room lights (Summer 2008).
2. Investigated the cost of installing motion detector actuated lights in public areas (locker rooms, restrooms, break rooms, storage rooms, etc.) (Summer 2008).
3. Employees have been encouraged to turn off computer equipment and all interior room lights when leaving for the evening/weekend (Summer 2008).
4. Use of electric-powered vehicles for parking enforcement functions is being evaluated. Recharging stations locations have been identified in the basement of Ramp V (Summer 2008).
5. Use of full-size hybrid vehicles to reduce fuel consumption is being evaluated, with two such vehicles in the administrative fleet. (Summer 2008).
6. Winter driving fuel conservation techniques are being encouraged for drivers of patrol, parking enforcement and special events vehicles (Winter 2008-09).
7. Electrical Use Reduction reports and Waste Reduction Reports are being posted in conspicuous locations (water fountains, break rooms, etc.) to increase staff awareness of University conservation efforts (Fall 2008).
8. Three environmental stewards have been appointed to monitor and encourage energy conservation within our department (Summer 2008).

MSU Surplus Store & Recycling

1. MSU Surplus Store/Storage facilities and equipment shut down at the end of the day. HVAC system programmed to operate during working hours only. Fall 2007
2. Recycling – See Physical Plant Annual report

University Physician

1. Use of a unit bicycle through the campus bike program
2. Understanding printer issues, and purchasing and use of duplex printers where they are used heavily
3. Transfer of most presentations to campus groups via projection, with location of presentation on our web site. We still give out copies of a power point presentation too often, but are working on that.
4. Commitment to not ordering bottled water, but using water from cooler and pitcher for meetings.
5. Encouragement of co-workers to walk to meetings on campus or use the campus bus system.
6. Consistent recycling of paper, cardboard, cans, and printer cartridges.
7. Consistent shutting off lights when we are not in a room and not using lights during the day when rooms with windows can use natural sunlight in the room.
8. Turning thermostats down on weekends and holiday periods
9. Computers are consistently turned off at night and on weekends, or when staff are out for more than an hour or two.
10. We have an active representative on the environmental stewardship team, who reminds us of new opportunities for energy conservation, as well as several people who offer reminders for lights computers, thermostat adjustments,
11. Plastic on windows in winter to keep rooms from air leaks.
12. Recycling Styrofoam delivery containers through a pharmaceutical company sponsored recycling program.

Other than overuse of glossy folders to hand out packets for meetings in Health 4U, we do not regularly distribute any publications to campus. This was stopped several years ago.

VP Finance & Operations

1. Installed motion sensor light switches in all offices and conference rooms
2. Use CFL lighting in offices and task lighting
3. All unused equipment is left unplugged so as not to draw phantom electricity
4. Central printer/copier/fax defaults to two-sided, saving energy and materials
5. All individuals have watt stoppers in their offices so that peripheral equipment (computer screens, speakers, monitors, printers) turns off during periods of inactivity.
6. For VPFO remodeling project, natural light was a key consideration, thus requiring less overhead and task lighting for individual offices.
7. Employees turn off computers and monitors each night
8. The thermostat is set at 68 degrees in the winter and 74 degrees for summer
9. Window shades are drawn at night for summer cooling days

<http://www.vpfo.msu.edu/Reports%20and%20Resolutions.htm>