

# THE ENERGY OBSERVER

Energy Efficiency Information for the  
Facility Manager

Quarterly Issue – March 2005

## Plug Loads

*The Energy Observer* summarizes published material on proven energy technologies and practices, and encourages users to exchange experiences with generic energy products and services. This quarterly bulletin also identifies informational sources and energy training for facility managers and staff. *The Energy Observer* is a service of the Energy Office, Michigan Department of Labor & Economic Growth.

This edition of the Energy Observer focuses on simple ways to reduce energy consumption used by electrical equipment on a daily basis. Energy costs associated with plug loads can add up to a substantial portion of a facilities electrical use, and should be minimized whenever possible. The following are low- to no-cost saving actions that are relatively easy to implement.

### WHAT IS A PLUG LOAD?

Plug loads are devices that plug into a buildings' electrical system and include appliances, TVs, VCRs, pop machines, drinking fountains, and office equipment such as fax machines, computers, printers, and copiers. In short, plug loads consist of any electrical equipment that is plugged into a wall outlet or electrical plug.

Studies show that electronics make up more than 9% of a building's electrical load. This is the fourth highest energy category

after lighting, heating and cooling loads.

### APPLIANCES, COMPUTERS & OFFICE EQUIPMENT

When purchasing appliances, computers and office equipment, make certain to specify the U.S. Environmental Protection Agency's ENERGY STAR® standards for eligible products. Manufacturers are required to meet certain energy efficiency criteria before they can label a product with the ENERGY STAR emblem, so these products represent your best energy saving value. Information on ENERGY STAR equipment requirements is available at: [www.energystar.gov](http://www.energystar.gov).



### DRINKING FOUNTAINS

Drinking fountains keep chilled water available on a continuous basis and can be modified to save energy. The compressor in the drinking fountain is what is supplying the refrigerated water. Eliminating power to the compressor during nighttime or unoccupied periods will generate significant savings.

Short of shutting off power permanently, the best option is to install a timer that adjusts the hours of operation to coincide with building hours. An inexpensive 24-hour plug-in timer can be installed

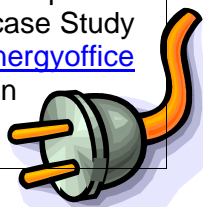
if a drinking fountain is classified as a plug load. *Please note drinking fountains that are directly wired into the building (not plugged into the wall) would require additional labor to install a timer into each unit. Usually the savings will not justify this added labor cost.*

### VENDING MACHINES

Refrigerated vending machines operate 24 hours/day and the display lighting operates continuously. Disconnecting the ballast and lamps can save up to \$100 per year.

During periods that a building is unoccupied, a vending machine can be turned off. A power controller is available that is activated by an occupancy sensor and that will shut the machine down when the area is unoccupied, primarily overnight. This device does not shut the machine down while the compressor is cycling, which could be harmful, and its use is approved by several of the major soft drink companies. The payback for power controllers is generally in the 1-2 year range. *NOTE: Consult your vendor or machine operator before implementing this measure.*

To view additional information about saving money by upgrading your vending machines please view a recent Michigan case Study at [www.michigan.gov/energyoffice](http://www.michigan.gov/energyoffice) (select Case Studies on the left navigation bar).



### Typical Appliance Wattage Values and Operating Costs

Equipment	Watts*	Annual Operating Cost**
Computer	200	\$ 140
Fax Machine	300	\$ 210
Radio or Clock/Radio	75	\$ 53
TV, 13"	60	\$ 42
VCR	45	\$ 32
Coffee Maker	800	\$ 561
Microwave Ovens (50% use)	1400	\$ 490
Vending Machines	3500	\$ 280
Refrigerator/Freezer, dorm size	350	\$ 245
Refrigerator/Freezer, standard	700	\$ 491
Ceiling Fan	100	\$ 70
Portable Heater (6 months)	1500	\$ 525
Aquarium Heater	110	\$ 77
Engine Block Heater (6 months )	1000	\$ 350

\*All wattages are dependant on age, size, specific features and use patterns.  
 \*\*Annual Cost is calculated using 8760 hrs/yr and \$0.08 per kWh.

### REDUCING HOURS OF USE

Hours of operation in an office or school building are typically 30% of total hours in a year taking nights and weekends into consideration. This means that shutting off many types of office equipment can be shut off during unoccupied hours can save up to 70% of their electrical consumption and, potentially more in school buildings that close for the summer months.

By following this practice with desktop computers alone your facilities can save an average of \$98.00 per year for each machine. Depending on the quantity of computers in your facilities the energy savings potential could be significant. Creating a facility policy and educating occupants of

the potential cost savings will contribute to annual savings.

### ESTIMATING SAVINGS POTENTIAL

You can easily estimate your savings potential. Using the watt values in the chart above you can determine how much you can save by eliminating some equipment and reducing the hours of use for other pieces of equipment. Use the formula below to estimate your savings potential. Please remember that this is only an estimate, as the wattages of your equipment can vary depending on size, age and style.

Calculate Energy Savings :

$$\frac{\text{Watts} \times \text{Hrs. Reduced}}{1000} \times \text{Cost per kWh} = \text{Cost Savings}$$

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Michigan Energy Office case studies are available at:  
[www.michigan.gov/energyoffice](http://www.michigan.gov/energyoffice)  
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Building Energy Consumption reports published by the Department of Energy:  
<http://buildingsdatabook.eren.doe.gov>

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