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Computers waste a lot of electricity if they remain turned on when not in use. As the Chippewa Falls Area School District recently discovered, the cost savings from reducing computer-related energy use can make a real difference. The district began turning computers and monitors off during evenings and weekends and saw an immediate budgetary impact. The cost reduction from this one energy saving measure saved a staff position that would have been eliminated due to budget cuts.

“We always tell our schools they can cut energy costs in a lot of different ways,” said Charlie Schneider, program manager for the Focus on Energy Schools Program. “Many steps are small, but they can really add up.”

Focus on Energy’s Schools Program maintains an on-line maintenance listserv for over 100 school building and grounds managers around Wisconsin. When participants have a good idea or a question about any maintenance issue, including energy efficiency, they share it with colleagues by posting it to the listserv. Recently, a Focus on Energy staff member alerted participants about a free software program created by the U.S. Department of Energy (DOE). This program automatically puts networked computer monitors “to sleep” when they are not being used.

Bob Severson, the director of buildings and grounds at Chippewa Falls Area School District saw this message and was intrigued by the energy savings potential. His district currently owns and operates 1,150 computers. And he knew that his schools, like many around Wisconsin, do not have a formal system for putting computers into “sleep” mode or turning them on and off during evenings and weekends.

Most schools leave the computer equipment turned on 24 hours a day during the week and sometimes on weekends as well.

Bob Severson talked to Brett Schnobrich, the district’s network manager, about the feasibility of installing the DOE software on the district’s computer network.

“We talked about Focus on Energy’s e-mail message and how we could use this software,” said Bob Severson. “But, as we talked, the idea grew and we decided to take DOE’s idea one step further.” They decided to control both the monitors and the computers.

In a matter of hours, Brett Schnobrich wrote a simple computer program that turns off both the monitors and the hard drives of every computer on the district’s network. The software program works as follows: at 4:15 in the afternoon, the network sends a message to each computer that it will be shut off at 4:30. If students or staff members want to continue working past 4:30, they can override the shut-off by clicking a box in the message. Otherwise, the program shuts off every monitor and hard drive at 4:30. The computers are turned on each morning as needed.

The energy savings are real: this one energy saving step will save the district approximately \$30,000 each year. And, at a recent school board meeting where difficult budget issues were being decided, it became clear that this unexpected reduction in energy costs will help offset a proposed staff cut.

Why isn’t this step taken more often? As Brett Schnobrich knew, information technology specialists hesitate to recommend turning computers on and off, because they argue that

the computers fail during the start-up process. For example, at a recent meeting of the information technology staff for schools in the CESA 10 district, attendees discussed this concern. They agreed that turning off computers led to greater failure rates.

After the meeting, Focus on Energy staff researched this issue and discovered that turning machines on and off regularly will lead to a higher failure rate. But, this rate is one percent or less. In fact, the entire computer may not fail. Instead, the failure may be limited to the computer's power pack. This part can be replaced for approximately \$50.

The bottom line: the energy savings achieved by implementing this measure dwarfs the potential cost. In this case, if twelve of the district's 1,150 computers fail, it will cost \$600 to purchase new power packs—a small cost when compared with the annual energy savings.

This energy saving measure was implemented in April of 2003 and is working well. There have been no complaints or concerns from staff or students.

"We were a bit worried that people would forget to save their documents before shutting down," said Bob Severson. "But so far, that hasn't been a problem."

"I'm always looking for ways to save energy," he said. "It was Focus on Energy's original message to the listserv that motivated us to take this step."

For more information about computer use in schools, call Focus on Energy at 800.762.7077 and ask to speak to a Schools Program representative. To join the school maintenance listserv, please contact Sandy Hahn at 715.720.2130 or at shahn@cesa10.k12.wi.us.

COMPUTER ENERGY USE: BASIC CALCULATIONS

According to the U.S. DOE, computer monitors generally use 7 watts of electricity to operate and a computer, or CPU, uses 47 watts when in sleep mode, for a total of 54 watts. To calculate the energy cost of the computer and monitor, use the following formula:

$$\frac{54 \text{ watts} \times \# \text{ of hours/day} \times \# \text{ of days/year}}{1000}$$

Then, multiply this number by the energy cost per kWh, typically \$0.07/kWh in Wisconsin. The following examples illustrate "before" and "after" costs.

BEFORE

1 computer and monitor operating 24 hours/day for 300 days each year

54 watts x 24 of hours/day x 300 days/year = 388,800 watts per computer/monitor system per year

388,800 watts/1,000 = 388.8 kilowatt-hours (kWh) per year

388.8 kWh x \$0.7/kWh = **\$27.22 annual energy cost per system**

AFTER

Daily savings if 1 computer and monitor system operates 10 hours per day

54 watts x 14 hours/day = **756 watts per day, per system**

Daily savings if 1 computer and monitor system is turned off during non-school days

54 watts x 24 hours/day = **1,296 watts per day for each system**

Total daily savings

School days: 756 watts x 180 days = 136,080 watts per system per year

Summer School days: 756 watts x 32 days = 24,192 watts per system per year

Non-school days: 1,296 watts x 153 days = 198,288 watts per system per year

Net Potential Savings = **358,560 watts per system per year**

358,560 watts/1,000 = 358.56 kWh savings per year, per system

358.56 kWh x \$0.07 = **\$25.10 in cost savings per year, per system**

EXAMPLE

100 computers in a school district

100 computers x \$25.10 = \$2,510 cost savings, per year

1 percent failure rate = 1 computer (\$50 to replace power pack) = \$2,510 - \$50 = \$2,460 cost savings, per year

1 percent failure rate = 1 computer (cost to replace entire computer) = \$2,510 - \$1,000 = \$1,510 cost savings per year

Note: If you would like an easy-to-use spreadsheet to perform these calculations for your school, contact your Schools Program Energy Advisor or call 800.762.7077 and ask to speak with a representative from Focus on Energy's Schools Program.