

Pulling the plug on electricity leaks

Move afoot to prevent electricity from leaking from cell phones, TVs, DVD players and other devices as growing use causes energy waste to soar

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By Michael Woods, Post-Gazette National Bureau

American humorist James Thurber -- the David Letterman and Jay Leno of another era -- got a chuckle by observing that his grandmother "lived the latter years of her life in the horrible suspicion that electricity was dripping invisibly all over the house."

Electricity "leaks" are no laughing matter today. Cell phones, computers, monitors, DVD players, cable TV boxes and other electronic products found in every home and office these days are wasting huge amounts of energy.

The leaks occur because many electronic devices can't be fully turned off without pulling the wall plug. While the knob or button may be turned off, in reality, the device may be in any of several standby modes, somewhere between fully off and fully on, wired so that its prongs draw electric current from the wall outlet 24/7.

"We call these things 'energy vampires,' " said Joe Shiffler, a spokesman for Power Integrations Inc., a San Jose, Calif., supplier of electronic chips that help power cell phones, computers and other electronic devices. "They have two teeth and suck electricity continuously."

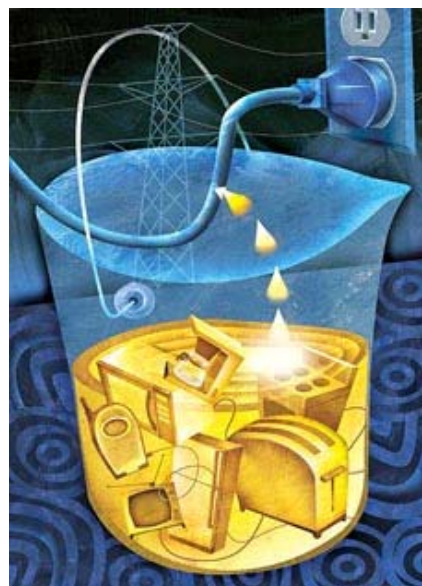
It may not seem like such a big deal, a VCR using a little extra energy here, a cell phone charger using a little extra there.

Indeed, many electronic devices have only a small thirst in the standby mode, consuming a few watts -- a fraction of the amount used by a single light bulb.

But with billions of devices running constantly, the total energy leakage is enormous. Nobody knows the exact waste from standby power because there have been few studies. But Alan Meier, an energy analyst who helped raise awareness about the problem while at Lawrence Berkeley National Laboratory in California, estimates that residential consumers in the United States spend more than \$5 billion annually on standby power -- about 5 percent of all electricity consumed in the country.

The figures are higher in other countries, with standby power accounting for 10 percent to 15 percent of residential electric consumption in Japan and some European countries. The International Energy Agency, where Meier now works, says it takes about four nuclear power plants to supply the standby power consumed annually in Europe. By 2010, it's expected the number will grow to eight nuclear plants.

While most people may be unaware of the energy vampires in their homes and offices, electronics manufacturers -- prodded by the U.S. government -- are starting to do something



Daniel Marsula, Post-Gazette
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about it. This summer, they will start selling products that aim to plug energy leaks at their source, the so-called power supplies that feed electricity into electronic products and provide standby current, among the most energy-inefficient of all common devices.

The change is an outgrowth of a new Environmental Protection Agency Energy Star program covering those ubiquitous external AC adapters used for cell phones, digital cameras, camcorder and countless other electronic devices.

The EPA, estimating that there are five such adapters in use for every American, in January came up with Energy Star guidelines that require the adapters to use 35 percent less energy than their predecessors to earn the seal. "These more energy-efficient designs will save energy and money," said Andrew Fanara, team leader at Energy Star.

The push to address electricity leakage is considered crucial as the number of electronic devices drawing standby power keeps rising, fueled by the explosive popularity of mobile phones, DVDs and other consumer electronics products.

Meier said that even more devices will start using standby power within the next 10 years, as computer chips and electronic controls are incorporated into refrigerators, dishwashers, air conditioners and other so-called "smart" appliances. Homes and offices in the future are expected to patch these appliances into their computers, audio and security networks.

"In the future, many devices in the home and elsewhere will have digital network connections with potentially dramatic impacts on energy consumption," said Bruce Nordman, who studies standby power at the Lawrence Berkeley lab.

"Networked products" that link computers as well as the TV, stereo, telephone and, in some cases, smart appliances "often never reach their standby, or minimum, level and instead remain in higher sleep levels, or more commonly, fully on," Nordman said.

Standby power hit the consumer electronics scene in 1968, with introduction of the first "instant-on" televisions.

Earlier TVs took one to two minutes for picture and sound to appear as the set "warmed up." Instant-on brought picture and sound immediately and involved changes to the internal power supply unit that feeds electricity to the TV components.

Such internal power supply units change the 120-volt alternating current (AC) from wall outlets into the direct current (DC) used by TVs and other electronic devices, while AC adapters and other external units do the same for small consumer electronics products such as cell phones and computer printers to portable power tools.

Whether internal or external, the typical power supply unit is very inefficient and wastes 30 percent to 50 percent of the electricity flowing through it, according to U.S. Department of Energy. Scientific reports actually have used the term "leaking electricity" to describe the waste -- electric current doesn't actually leak.

To be sure, some standby power is necessary or useful. It keeps TVs, VCRs, DVD players and other devices such as security alarms on alert and ready to receive signals from remote control units, for instance.

Standby power also allows refrigerators to monitor temperature and decide when to turn on, keeps batteries in cell phones and camcorders fully charged, lights up the time display on microwave ovens, and enables toasters to toast faster.

Most standby power, however, is a waste, consuming energy for no good reason, Meier said. President Bush highlighted the issue four years ago when he issued an executive order

accelerating domestic efforts to cut standby power.

The executive order called on federal agencies to buy computers, cell phones, and other electronics products that use minimal standby power -- a change the Energy Department estimates will save the government about \$25 million by 2008.

EPA's expansion of the Energy Star program to power supplies initially will cover only external power packs and adapters. Cell phones and other small electronic devices will qualify for the seal if their efficiency is in the top 25 percent of units on the market. They also must be smaller than traditional adapters and produce less heat.

The Energy Star program won't cover appliances and other larger products with internal power supplies until the end of 2006, the EPA said, because those devices are more complex. Energy Star is a voluntary effort that only encourages manufacturers to market more efficient products.

California is giving manufacturers a stronger nudge, with its mandatory energy efficiency standards for external power supplies sold in the state that go into effect next January. The regulations could have a sweeping impact nationally, since few companies want to be excluded from the California market, the nation's largest.

Speaking at an international conference on standby power in March, Meier said a global consensus is emerging that standby power should be reduced to minimal levels, less than one watt.

Shiffler, of Power Integrations, the California electronic chips maker, said the technology is available and reasonably priced to achieve the goal. His firm is the leading maker of circuits for power supplies that contain built-in "intelligence" -- circuitry that senses when a device doesn't need so much electricity and shuts down the flow. So far, however, energy-efficient chips are used in only a small fraction of all power supplies, he said.

Consumer concerns about standby power also are leading to development of devices that make it more convenient to pull the plug on products that typically remain "on." OneClickPower, a British firm, has been selling a "smart" surge protector with outlets for a computer, monitor, printer, scanner and other devices. Its circuitry senses when the devices go into a standby mode, and automatically disconnects them.

"The panel can pay for itself during the first year of operation," said Peter Robertson, OneClickPower's managing director. He plans to begin marketing the device in the United States this autumn.

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