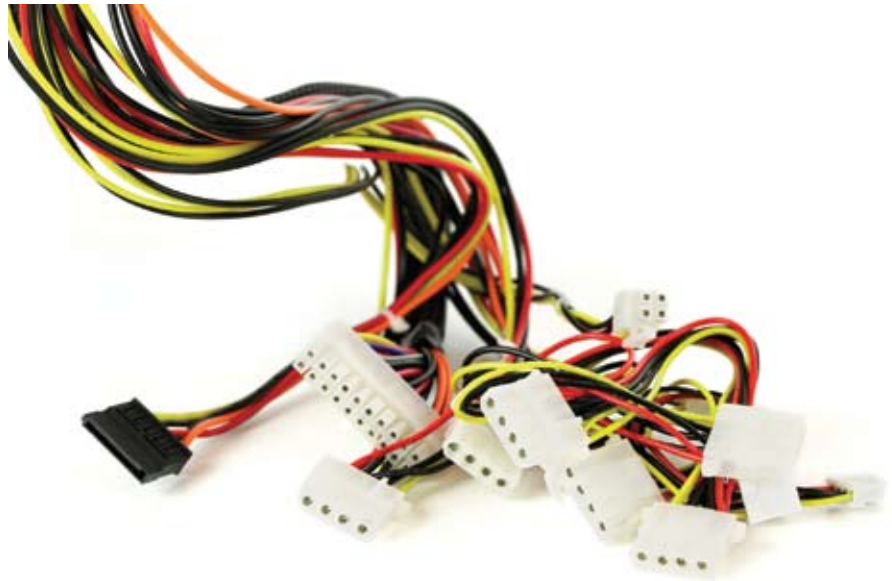




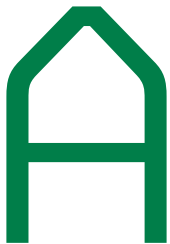
# A CLIMATE OF CHANGE

Energy-efficient computing is now a goal among eco-conscious businesses and consumers.



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All good things in life—that sporty convertible, the week off from work, chocolate—come at a price. Computers are no exception. They solve problems, entertain us, and make us look good to the boss. But these armies of PCs and servers need a lot of electricity to run. Indeed, information technology is responsible for 2% of the world's carbon dioxide emissions, and as more equipment comes online, IT's contribution to global warming—and the strain on our energy resources—will continue to grow. According to Forrester Research, the number of PCs in use will increase from one billion to 2.25 billion by 2015. The cost isn't just to the environment, either.

Someone has to pay for all of that power.

Here's the shocker: The cost is currently far more than it needs to be. In the typical desktop PC, nearly half of the power coming out of the wall is wasted, never making it to the processor or other components. And because that wasted energy is expended as heat, more air conditioning is needed to cool off the room. That only increases the energy used, and the cost of computing. But it doesn't have to be this way. More efficient power supplies can cut down on waste, but so, too, can simple practices on the part of users. For example, virtually every PC comes with power-management software that puts the machine into a low-power "sleep" or "hibernate" mode when it is inactive. Yet most users never turn this feature on. This comes at a cost, as well, as the typical desktop could see a 60% reduction in the electricity it consumes if power management was embraced.

## IGNITING CHANGE

The key, then, to energy-efficient computing is twofold: develop technologies that make more effective use of power; and encourage users to make use of power-saving tools. These twin goals are the mission of the Climate Savers Computing Initiative, a nonprofit group of eco-conscious consumers, businesses, and conservation organizations founded by Google, Intel, Microsoft, and the World Wildlife Fund in June 2007. More than 300 companies and groups are now members, including manufacturers that have pledged to develop products that meet tough new energy-efficiency standards and organizations that have committed to buy more efficient systems and implement power-management practices.

By getting the word out that energy-efficient computing isn't just good for the environment and the bottom line,

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but is also easily attainable, Climate Savers Computing hopes to reduce the power consumption of computing by 50% by 2010. That will reduce CO2 emissions by some 54 million tons a year—the equivalent of taking 11 million cars off the road.

So far, much of the group's work has focused on improving power-supply efficiency. This is the low-hanging fruit, since it's where so much power gets wasted. "When we started the initiative, the power supply was about 70% efficient," says Lorie Wigle, president of the Climate Savers Computing Initiative and general manager of the eco-technology program office at Intel. "It's a really important area for the industry to make improvements, and we're seeing a dramatic increase." Indeed, Climate Savers Computing members commit to purchasing equipment with

power supplies that are at least 80% efficient, a figure that will increase gradually over the next several years.

By encouraging users to buy energy-efficient equipment, Climate Savers Computing is also giving manufacturers an incentive to invest in research. "There are a variety of technologies that can make power supplies more efficient," says John Frey, senior sustainability executive at Hewlett-Packard, one of seven organizations on the Climate Savers Computing board of directors. "Some existed when we started, but others didn't because there wasn't enough demand. Sometimes they cost more and manufacturers couldn't ship in volume, so it didn't make sense to pursue. When our members commit to buy products that meet the efficiency standard, they're telling suppliers to continue development, because there will be demand."

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## GETTING THE WORD OUT

But there is one other ingredient needed for energy-efficient computing to become the norm: education. That doesn't just mean encouraging best practices, like setting displays and hard drives to turn off after 15 minutes of inactivity; it means correcting misinformation. "We found that 25% of computer users in the U.S. think that screen savers save energy, when actually the opposite is true, as they tax the processor and thus require more power," says Wigle.

Cost is another area where it's important for users to see the full picture. An energy-efficient system may be more expensive to buy (about \$20 extra per PC), but over several years the energy savings will more than make up for any premium, especially if the equipment is combined with sound power-management policies. Indeed, by reducing the energy consumption of some 50,000 computers used within the company, Dell—another member of the Climate Savers Computing board—expects to see \$1.8 million in annual savings.

But Dell went a step beyond, using built-in power-management tools. For many organizations, this is a crucial point. These tools typically look at keyboard and mouse activity, and when none is detected over a period of time, the machine is put in a low-power state. But what if the PC is performing an automated task such as running an application in the background, or downloading a file? Interrupting that can be bad for business. To make sure that its systems were shut down only when appropriate, Dell deployed special software that could be managed and customized to a finer degree than the stuff included on a typical, well, Dell.

Among these advanced tools is a software program called Power Save, by Faronics Corp. "What we did was put a little intelligence into the decision to shut down," says Farid Ali, the



company's CEO. "Power Save monitors CPU usage and knows not to shut down if a certain application is running, or if there is hard disk activity. It also gives IT managers the ability to wake up a machine remotely, in case they have to load a patch in the middle of the night. These are vital features, because the IT staff's main concern isn't reducing energy, but reducing downtime. Now they can do both."

They can also see significant savings. By using Power Save, which costs about \$14 per license, three school districts (two in California, one in Massachusetts) are on track to save \$840,000 in energy costs this year. "People are starting to discover that, with the right products, they can go green and save money at the same time," says Ali.

## GREEN PRODUCT DESIGN

Meanwhile, hardware companies are also discovering that they can significantly optimize their products for performance, efficiency, and value. At Super Micro Computer Inc., a leading manufacturer of computer server systems and building block solutions,

power supplies for their new SuperBlade systems achieve an industry-leading 93% efficiency. By combining this with cutting-edge thermal and cooling architecture—improved air-flow designs, heat sinks, and cooling fans—the company's engineers have been able to maximize product performance even as they minimize impact on the environment. "Over the past two to three years, we've boosted the energy efficiency of our products over 30%, and as we continue enhancing our technologies, that number will go up," says Charles Liang, founder and CEO of Supermicro.

At the same time, Supermicro has been setting the record straight on just what efficiency costs. "People tend to think you need to pay a premium for environmentally responsible products, but over a three-year span, our customers can save up to \$500 per server in electricity costs, compared to industry-average server products," says Liang. "We've shown that energy-efficient solutions can indeed be the most cost-effective solutions: a win-win situation."

Green IT has been a big win for Supermicro, as well. Earlier this year, its SuperBlade servers were chosen by CERN, one of the world's largest particle physics labs, as part of a significant upgrade of its computing facility for the new LHC (Large Hadron Collider) project. Superior energy efficiency was among the factors behind CERN's selection.

But for Supermicro, this is just the beginning. "There is still a lot of room for improvement," says Liang. "And we're going to achieve it because our customers, our company, and our world all depend on it." If he and other green IT advocates are right, energy-efficient computing will be one problem we won't need a computer to solve. ●

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