Energy efficiency for the enterprise

Reducing energy costs and environmental impact

Conquer your energy challenges.

In data centers around the world, energy costs are rising rapidly and consuming an ever-greater portion of IT budgets. Here's a sign of just how bad it is getting: It will soon cost more to power and cool a server over its lifetime than it does to buy the server.

Everywhere we look, IT facilities are running out of cooling capacity and power. With multiplying numbers of servers, higher densities and hotter processors, data centers are hitting a wall. Even though racks are half empty, many IT operators cannot add another server into their environment. Air conditioning systems are maxed out and power distribution infrastructure is completely utilized.

More importantly, the more electricity data centers and computer closets consume, the more natural resources get depleted, and the more greenhouse gases get emitted. HP scientists estimate business technology consumes 415 million tons of coal per year with 864 million tons of CO2 greenhouse emissions. Measure your carbon footprint. It's no surprise that enterprises around the world face a growing range of environmental regulations—and a growing realization that the status quo has to change.

Here's the new reality: If we want to be in business in the future, we have to change the way we use power and reduce our impact on the environment. Sustainable computing is the obvious answer from a technology perspective. And sustainable business practices will lay a pathway to the future.

A comprehensive energy-efficient strategy is essential in helping your transformation to an Adaptive Infrastructure —one that enables your organization to optimize and manage your IT infrastructure and automate IT service delivery. An energy-efficient data center is key to sustainable business outcomes.

How do you meet the challenges head on? HP has led the way to sustainable computing for more than two decades. Let us come alongside of you, share our best practices and help you execute a comprehensive energy-efficient strategy. We're ready to help you:

- Reduce your energy costs
- Reduce your carbon footprint
- Make the most of your IT investment

Energy and the environment: the HP way.

At HP, we're gratified to hear growing numbers of technology companies entering the drive toward environmental responsibility. These are goals we have worked toward for more than 25 years.

From our 11-year-old "Cool Team" energy and thermal solutions initiative to our comprehensive print cartridge recycling programs, from our involvement with the Green Grid technology project to our 1,000 energy efficiency patents, we have long worked to create more sustainable computing environments.

Today, HP innovation is helping companies around the world realize the economic and environmental benefits of comprehensive energy-wise strategies. Based on our experiences in countless enterprise data centers, as well as our own data centers, we believe we can help your enterprise cut data center energy costs by as much as 50 to 60 percent.

Gains like these aren't achieved with point solutions that address narrowly targeted issues. Rather, they are made possible through the implementation of comprehensive strategies for cutting energy consumption and reducing environmental impacts.

These new, forward-looking strategies rest on three pillars: energy savings, ecosystem efficiency and environmental leadership.

Save energy, cut costs and increase performance.
You don't have to sacrifice computing performance for energy efficiency. With HP, you can have both. We help you reduce power consumption while driving ever-greater computing performance in your data center.

We put you on the path to these complementary goals by building energy-saving intelligence into our technology products, by driving more performance in a smaller energy footprint and by enabling your efforts to add new capacity to your existing facilities.

HP BladeSystem, ProLiant and Integrity servers, for instance, leverage unique HP Thermal Logic technologies to control power consumption and thermal output. This makes it possible to pack more computing power into your data center while holding the line on power consumption.

You can reduce your overall storage power usage by up to 50 percent with smart technology like thin provisioning, dynamic capacity management, and offline storage, all offered as part of the HP StorageWorks portfolio. By eliminating wasted capacity and adopting StorageWorks best practices for energy savings, power cost savings can add up quickly.

In another technological advance, the HP Modular Cooling System uses chilled water to supply uniformly distributed cool air across the entire front of the server rack. This allows you to triple the standard cooling capacity of a single rack. The result? You can increase server densities within the same footprint.

Our Dynamic Smart Cooling (DSC) technology, meanwhile, helps you reduce data center cooling costs by as much as 50 percent. DSC makes this possible by sending cool air to where it is most needed, when it is needed. With this HP innovation, sensors deployed on racks feed real-time thermal data to your management software. This allows your equipment to interact with the power and cooling facilities that support your data center. This smarter, more holistic approach to cooling is one of the keys to cutting your power bills.

Drive energy efficiencies across your ecosystem.
In today's data centers, energy is wasted throughout the power supply chain. That's why HP takes a broad approach to increasing the efficiency of your entire ecosystem. We work actively to promote energy-efficient strategies, from the desktop to the data center.

We identify energy waste throughout the data center and help you put the right people, processes and technology in place to stop the waste. Whether you are building a green-field data center or trying to get the most mileage out of your existing facilities, HP Services brings the right experience mix to help guide your design decisions.

To help you move toward a highly efficient data center, we offer innovative thermal assessment services. These services leverage sophisticated modeling tools and techniques to determine the unique thermal conditions for your high-density server and storage equipment. The information generated by thermodynamic modeling helps you understand what you need to do to improve the efficiency of your data center and gain more value from your energy expenditures.

Our IT consolidation solutions help you reduce the number of energy-consuming technology assets in your environment. Our entire product line is designed for consolidation, from HP Integrity, ProLiant and BladeSystem servers, to HP StorageWorks products. To extend the gains, we help you put holistic virtualization approaches to work to enable greater power and cooling efficiencies. The net result is fewer assets —and less energy consumption. We have seen results of nearly $1 million per year in savings through consolidation from 368 servers with an average of 17 percent utilization down to 5 servers with an average utilization of 70 percent.

Another way to achieve greater efficiencies is to automate the provisioning of power and cooling. We make this possible with software-driven control systems, like HP Dynamic Smart Cooling that help you optimize the cooling of systems in real time. Insight Power Manager, in turn, lets you measure, regulate and cap power use to make the most efficient use of your infrastructure.

Reduce the environmental impact of technology.
In an age of scarce natural resources and growing environmental threats, businesses have to take a broader view. Here's the simple truth: If a business doesn't concern itself with the environment, it may not be able to stay in business in the long term.

At HP, that's a thought we keep in mind as we help you reduce the environmental impact of the technology that powers your business. We strive to build energy savings and environmental protection into everything we do. That's part of our DNA, and one of the reasons why we continue to win recognition for environmental leadership. Fortune magazine, for instance, put HP on its list of 10 Green Giants—companies that have gone beyond the law to operate in an environmentally responsible way.[1]

Drawing on this heritage, we help you promote environmental responsibility on several fronts. We strive to make it easy for you to recycle products to preserve the world's natural resources and to reduce the environmental impact of technology. And we help you reduce your carbon footprint through the use of more sustainable computing practices. We see this as part of our mission to reduce the global footprint of technology, from coal consumption to carbon emissions.

When you work with HP, you're not alone. You join a community of companies that is working to drive environmental responsibility on a global scale. You gain the benefits of our work to create positive change through collaboration, joint research and participation in a variety of industry consortium and regulatory agencies. In these efforts, we team with other technology leaders to influence environmental policy and drive more sustainable technology practices that you can put to use in your business.

Within our own research environment, HP Labs is creating and delivering factual and objective approaches to measuring the impact and gauging the efficiency of business technology. These efforts include implementation of a Power Usage Effectiveness ratio to help you gauge technology power usage versus heat generation.

[1] "10 Green Giants," Fortune Magazine, April 2, 2007

Meanwhile, we are working to help you reduce the consumption of materials, preserve natural resources and reduce waste—through innovations such as Factory Express, product trade-in and asset recovery services. In 2006 alone, HP recovered and recycled more than 10.4 million pounds of plastics.

When you think energy and the environment, think HP.

HP has a long, rich heritage of environment responsibility. We're committed to using our expertise in this arena to help our customers and the technology industry take leadership roles in protecting our environment. We want to help companies like yours leverage our green heritage—so you can become a green leader in your own industry.

And we have the resources to help you get started down this greener path. Want to develop a comprehensive energy and environmental strategy that spans from the desktop to the data center? We can help you put a multi-dimensional strategy in place.

From our recycling programs to our supply chain processes to our energy-efficient computing strategies, we're working to increase the sustainability of today's businesses. A few examples of this environmental leadership:

- For more than a decade HP has placed a heavy emphasis on energy efficiency. In 1996, we started a "Cool Team" with experts from across departments focused solely on energy and thermal solutions.
- Approximately 1,000 HP products have achieved the Energy Star® qualification from the U.S. Environmental Protection Agency (EPA).
- We're a founding member of the Green Grid, which promotes the development of energy-efficient processors, servers, networks and other technology.

Though efforts such as these, we weave energy conversation and environmental protection into our corporate mission. They are in our DNA—and a big part of what we bring to you.

Ultimately, we want to help you sustain your business in a manner that sustains the planet.

The sooner we start, the better the business outcome.

At HP, we're ready to put our energy-wise strategies to work to help you cut the cost of computing, preserve natural resources and make your company a green leader.

Ready to get started? Let's begin with a discussion of your needs and goals, and how you can draw on our resources, investments and green heritage to move your organization forward.

To begin the conversation, contact your HP representative today, or visit us at **www.hp.com/go/energyefficiency**.

To learn more, visit www.hp.com

4AA1-4271ENW, July 2007

invent