

10 Key Elements of a 'Green IT' Strategy

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Every IT organization can substantially improve its environmental performance, while often reducing or avoiding costs. IT organizations must go beyond the data center and adopt a very broad approach to their environmental programs.

Key Findings

- IT significantly impacts the environment throughout its life cycle. Most enterprises have not paid enough attention to this until recently.
- IT's environmental impact can be significantly reduced by behavioral changes, as well as technology changes.
- Given the relative energy and materials inefficiency of most IT infrastructures today, many green IT initiatives can be easily tackled at no incremental cost.

Recommendations

IT organizations:

- Implement a broad-based environmental program tackling energy and materials efficiency, as well as issues of waste and supplier management.
- Ideally, do this as part of a broader enterprise initiative to help drive behavioral changes.

WHAT YOU NEED TO KNOW

There is a lot more to an IT environmental program than simply buying more energy-efficient servers, worthwhile though that is. The green IT program must engage everyone in the IT organization, including the architects, and it will increasingly require the engagement of the software developers. Green IT is not just something for the data center manager.

ANALYSIS

We outline 10 action areas for any IT organization's environmental program.

Action 1: Define an Environmental Policy and Strategy for First-Order and Second-Order Effects

IT organizations must define an environmental policy and develop a strategy that addresses what needs to be done to reduce the environmental impact of the IT infrastructure and operations (first-order effects). The strategy should also outline ways IT can reduce the environmental impact of the enterprise's operations, products and services, and supply chain (second-order effects). Here are some tips to define an environmental policy and strategy:

- Identify the enterprise's position on environmental issues, such as climate change and waste, including e-waste. If it exists, read the corporate social responsibility policy, and deduce the implications for IT. Initiate a discussion with senior executives about how environmental issues should be dealt with, if at all. Particularly in service industries, the IT infrastructure can often be the source of one of the organization's biggest environmental impacts.
- Conduct an environmental assessment and energy audit of the IT infrastructure.
- When discussing the environmental policy and strategy, consider the risks of doing nothing.
- Decide if the enterprise's response will be aggressive, measured or passive and to which issues it will take this response (see "The IT Industry Is Part of the Climate Change and Sustainability Problem").
- Based on these discussions and decisions, create an appropriate environmental policy for the IT organization.
- Develop a strategy to reduce power consumption and carbon dioxide emissions in the data center, client computing, network, printing and so forth. That strategy must engage every function within the IT organization, not just the data center manager and infrastructure teams.
- Identify opportunities in which IT can be used to improve the eco-efficiency or reduce the environmental footprint of the enterprise, its supply chain, and its products and services. Having a high-level view on the enterprise's environmental impact helps.
- Create an environmental-assessment process for all IT-related projects and investments.
- Create an equipment disposal process and controls.

- Identify appropriate metrics that will show progress against the enterprise's and IT organization's environmental goals
- Appoint a manager to lead the initiative.

Action 2: Measure and Analyze Progress

As with any program, the endeavor needs to show progress (see "Tutorial for the Environmental Metrics of an IT Organization"). Metrics can cover a range of issues, including energy efficiency, carbon dioxide emissions, waste management, materials efficiency, supplier management and so on. At the very least, energy consumption and carbon dioxide emissions should be measured.

We strongly recommend that IT be accountable for the electricity it consumes. Not only does IT become responsible for the costs it drives, but this will also drive better environmental behavior in terms of investing in infrastructure that is more energy-efficient.

Targets for the environmental issues that the enterprise has chosen to tackle should be set. For example, a 10% to 25% reduction in energy consumption in the first year of the program is perfectly achievable. We also recommend creating an environmental dashboard.

Action 3: Green the Staff

Poor energy consumption habits account for a lot of electricity usage, in the workplace and in the data center. Fixing that requires engaging employees in a broad-based environmental program. Most enterprises that have launched environmental programs have had a positive response from the staff. Failing to engage the staff will limit the progress that the program can make because the staff can undo any technology fixes. Some of the measures we have seen enterprises adopt include these steps:

- Create an employee charter for all stakeholders, which lays out personal responsibilities and outlines expected behaviors. Announce which services the company will provide, such as a provision of recycling facilities for employees' domestic electronic waste (this can be useful where local services are not available).
- Create a work environment that includes subtle reminders, such as removing deskside bins and providing tips for recycling.
- Develop reward schemes that address the commute to work, as well as business-related travel. We have seen organizations provide reward schemes for employees who commute by walking, bicycling, car-pooling and using public transportation. Similarly, it's not enough to put videoconference services in place for internal or external meetings. The organization needs to consider how it can encourage the use of videoconference services by addressing behavioral issues (see "How Green Does Your Video Look?").
- Offer energy-efficiency advice and assistance for home workers — for example, offer to pay for low-energy bulbs or provide financial assistance for the purchase of hybrid or electric cars.

Action 4: Switch It Off if It's Not in Use

Enterprises have an opportunity to reduce carbon dioxide emissions in a dramatic way simply by turning off equipment after hours. PCs and monitors account for more than a third of IT power consumption and carbon dioxide emissions.

The fix involves effecting behavioral changes among the staff:

- Measure and report office power consumption; get as granular as possible.
- Use and enforce "aggressive" power management.
- Discard screen savers.
- Educate the staff.
- Use a low-power state, such as standby, for PCs and monitors after hours.
- Use agents and schedulers to automate.

For more information on reducing PC power use, see "PC Power Management Activation Leads to Significant Power and Cost Savings."

Action 5: Act Holistically About Energy Efficiency in the Data Center

Gartner and many others have written extensively about improving the energy efficiency of the data center. It is a point of focus for the enterprise, and there is usually a lot of opportunity to make big improvements, save energy and money, and extend the life of the data center. The main opportunities for improvement are usually centered on cooling, airflow, fans, power distribution losses (power supplies, uninterruptible power supply [UPS], power distribution units [PDUs] and so forth), and better use of the capacity in place (see "Questions on Power and Cooling Issues From Gartner's European Data Center Summit in October 2007").

Action 6: Move From "Always On" to "Always Available" in the Data Center

There are significant opportunities to better manage underutilized capacity in the data center and, thereby, increase energy efficiency:

- Virtualize and consolidate. There are many factors in deciding whether to virtualize. However, from an environmental viewpoint, it is a clear decision, because virtualization improves the energy and materials efficiency of the IT operation.
- Decommission unused equipment. Most enterprises we talk with are identifying a lot of equipment that is plugged in, but simply no longer used. Initiate a program to check for and remove unused equipment.
- Stop overprovisioning — on servers, storage, UPS, cooling and so on. For many reasons, IT has habitually overprovisioned everything. In an energy- and carbon-sensitive world, this is a habit that needs to change.
- Use power management features to throttle power based on use.
- Change the power state of equipment not in use. Start with the test and development environments. Use existing tools such as job schedulers to help you do that (see "The Role of Job Schedulers in Reducing Power Consumption and Carbon Dioxide Emissions"), as well as emerging tools such as those from Cassatt (see "Cassatt Addresses Important Need for Data Center Power Saver").

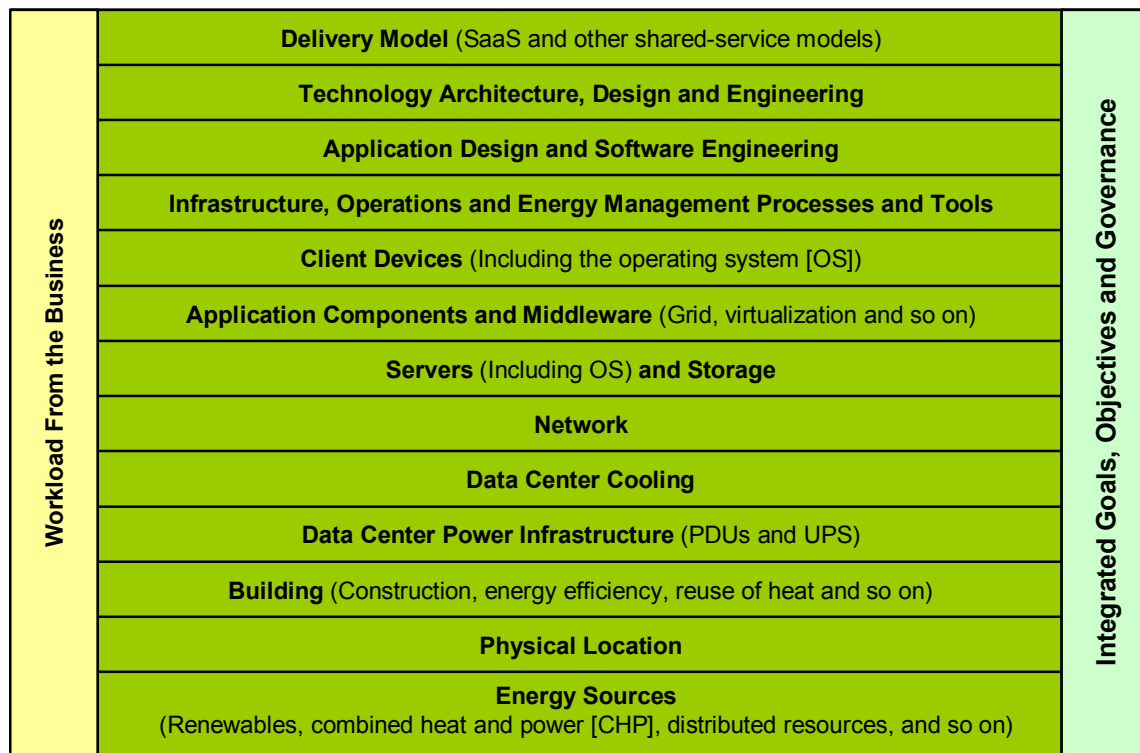
Action 7: Consider Energy at Every Decision Level, and Use the IT Energy Stack

IT energy efficiency involves more than improving just the data center's cooling, power management, energy source and so on, although these areas are good places to start. The IT management team should work to drive energy efficiency across all areas of IT — the software, the technology infrastructure, and the architecture and design of these things. This means that architects and software engineers, as well as the infrastructure teams, need to consider their roles in energy efficiency.

Figure 1 shows the IT management team's decision points that can influence the energy consumption of the IT infrastructure. This is not just about the energy efficiency of the server; this involves sourcing decisions and so forth. For example, shared-service models such as software as a service (SaaS) have the potential to be much more energy- and eco-efficient (see "Are Alternative Environmental Delivery Models More Environmentally Sustainable?"). Although few enterprises today will make sourcing decisions based on eco-efficiency, this will become a consideration.

Likewise, architectural decisions (such as mainframe versus distributed platform, thin-client versus rich-client, and service-oriented architecture versus traditional architecture) have energy implications. Data center managers should push some of the responsibility for energy consumption onto some of their peers.

Figure 1. The IT Energy Stack



Source: Gartner (December 2007)

Action 8: Ensure Green Printers and Printing

Paper consumes 10 times the energy of the printing process, and the typical office worker prints 1,000 pages, or 40 pounds, a month. So the big issue in most enterprises is the volume of printing. However, with 178 million printers, copiers and multifunction devices shipped in 2007, most enterprises also have far too many physical devices.

The fix, again, is mostly behavioral (see "How to Manage the Environmental Impact of Printing"):

- Print less.
- Educate the staff.
- Enforce duplex printing (that is, printing on both sides of the paper), use pull printing (that is, use a dedicated server to relay print jobs to the printer), and drop the use of banner pages.
- Buy Energy Star devices (in the U.S., the Energy Star indicates superior energy efficiency).
- Consolidate printers.
- Use long-life printer drums.
- Recycle toner, paper and cartridges, and dispose of items properly.
- Choose a vendor that supports all-around environmentally sound products, processes and services.

Action 9: Challenge the Technology Providers' Products

The technology provider should be questioned about the environmental performance of the relevant products throughout the products' life cycles:

- Look for products that are compliant with the European Union's (EU's) Restriction of Hazardous Substances (RoHS) directive.
- Ask how the product has been designed for recycling and how much recycled content it includes.
- Look for product longevity, including upgradability and modularity.
- Look for eco-labels, in particular the Electronic Product Environmental Assessment Tool's (EPEAT's) Silver and Gold designations. However, you must understand the eco-labels and develop your own criteria (see "Use Existing Standards for a Quick Start to Green IT Procurement" and "Recommended Notebook Configurations, September 2007 Update").
- Seek out vendors that can comply with the EU's Waste Electrical and Electronic Equipment (WEEE) requirements in all the geographies your enterprise operates in, and particularly in geographies that provide a "take back" service (that is, they take back old equipment). Also, ensure that the disposition channel is audited.
- Negotiate for reduced packaging, manuals and reduced physical shipments. Similarly, negotiate for the vendor to collect and recycle the packaging.
- Ask about performance, costs and environmental trade-offs made in the design.

- Ask about the life cycle environmental and carbon dioxide emissions footprint of the products under consideration. Favor vendors that have conducted life cycle assessments and can explain how they are improving the product as a consequence of conducting life cycle assessments.

Action 10: Look for Insight Into the Technology or Service Providers' Own Environmental Programs

Most enterprises are not in a position to conduct a thorough assessment of the environmental performance of their technology or service providers. However, there are some areas to focus on that can tell you the most about the providers' actual commitment to the environmental values they espouse:

- Read the technology or service providers' sustainability report, and compare it against an industry leading report, such as those from BT Group. Compare the level of transparency, as well as the level of detail in the information provided.
- Look for an environmental assessment of the vendor's operations, products, services and supply chain. Look for a policy and strategy that addresses the areas it has identified as having the greatest impact. Look for evidence of improved energy and materials efficiency and reduced greenhouse gas emissions from its operations.
- Look at the longevity of the provider's environmental program. Many technology providers have really started a program only in the past two or three years. Many service providers still have no program today. The providers with the more rigorous programs typically will have been running the longest.
- Look at where the environmental or sustainability program reports to within the enterprise. If the program reports to the marketing or PR departments, this often says a lot about the program's focus.
- Seek information from management about the supply chain. Technology providers do not have the control over their supply chains' environmental performance that most of them would like. Their degree of focus is a good indication of how serious they are about their environmental programs. The best technology providers will tell you about their supply chain environmental risk assessments, how they addressed those risks, how they score their suppliers, the number of suppliers by region, the wording they put in the contracts, how many detailed audits they've conducted and who conducted them, and how many serious noncompliance issues they found and how they are managing them. The weaker technology providers will not know or will hide behind confidentiality.
- Look at where the providers are innovating. Seek evidence of innovation along the full life cycle of the equipment. If their focus is just on in-use power consumption of the equipment, that isn't a bad thing, but it won't rate them highly for environmental performance. Look for materials innovation in products, and look for efforts to address the materials and energy efficiency of their own operations.

Tactical Guidelines

- Define an environmental policy, identifying and prioritizing the issues the organization wants to address. Do this within the context of the enterprise's broader environmental and corporate social responsibility policies.

- Have the IT organization be responsible for the energy efficiency of the data center and IT equipment.
- Make the data center a priority, but understand the green IT strategy must extend beyond that.
- Create an environmental performance dashboard based on the enterprise's and IT organization's environmental policy.
- Use existing and emerging energy management tools, as well as address behavioral issues to decrease the power consumption of IT-related equipment.

RECOMMENDED READING

"The IT Industry Is Part of the Climate Change and Sustainability Problem"

"Tutorial for the Environmental Metrics of an IT Organization"

"How Green Does Your Video Look?"

"PC Power Management Activation Leads to Significant Power and Cost Savings"

"Questions on Power and Cooling Issues From Gartner's European Data Center Summit in October 2007"

"The Role of Job Schedulers in Reducing Power Consumption and Carbon Dioxide Emissions"

"Cassatt Addresses Important Need for Data Center Power Saver"

"Are Alternative Environmental Delivery Models More Environmentally Sustainable?"

"How to Manage the Environmental Impact of Printing"

"Use Existing Standards for a Quick Start to Green IT Procurement"

"Recommended Notebook Configurations, September 2007 Update"

This research is part of a set of related research pieces. See "Green IT: The New Industry Shock Wave" for an overview.

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