Book Green Tech

How to Plan and Implement Sustainable IT Solutions

Lawrence Webber and Michael Wallace
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Recommendation

A company's energy and technology requirements are considerable: Think of all those plugged-in, energy-draining workstation computers, printers, faxes, modems and copy machines, as well as servers and data centers, burning away the watts. Multiply a single company's energy use by millions of businesses around the world. It all adds up to environmental degradation, which the planet can no longer sustain. The first step to a solution is figuring out how your organization can improve. IT professionals Lawrence Webber and Michael Wallace suggest practical actions your company can take to reduce its energy requirements and to deal with its toxic-waste disposal problems. They delve into the nitty-gritty details of how your firm can cut back on its information technology (IT) expenditure by going green. Their explanations of various U.S. legal conventions and international environmental standards are especially useful. *BooksInShort* recommends this hands-on manual as a valuable planning resource for IT managers who want to lead their departments and their companies into the new, green mandate for business.

Take-Aways

- Information technology (IT) is helping to destroy the planet.
- To mitigate this deadly problem, develop an environmentally sustainable IT department.
- "Green" IT reduces costs and improves efficiency.
- It generates customer goodwill and gives you a competitive advantage.
- Focus on business benefits when you present your green IT plan to senior management.
- Purchase only Energy Star-compliant computer units and peripherals from responsible vendors.
- Deal only with suppliers who certify that their equipment conforms to the best-practices recommendations of the International Organization of Standards (ISO).
- To recycle or dispose of used equipment, employ vendors that environmental monitoring organizations certify as green.
- Require employees to turn off computers and other equipment that they are not using.
- Eventually, governments will almost certainly force companies to use environmentally sustainable practices.

Summary

Information Technology: Helping to Kill Planet Earth

The computer revolution was supposed to replace paper and save billions of trees, thus preserving the environment. Things have not worked out that way. In fact, computers have made matters worse. They use so much energy to power units and cool servers that IT-related energy is now a major annual cost for businesses. Manufacturing computer components, including chips, drives, screens, keyboards, monitors and other assorted hardware, pollutes the environment. Outdated and

broken computer equipment and peripherals overwhelm landfills.

> "We are sustainable when our use of resources does not permanently deplete or damage our supply, including natural resources, energy and capital." [– Robert Houghton, president, Redemtech]

To prevent further environmental degradation, "green" your IT department. This will not be easy. Computers contain "steel, aluminum, copper, petroleum" and other nonrenewable resources. Nevertheless, companies that implement sustainable, "reduce, reuse, recycle" policies regarding their purchase, management and disposal of IT assets can cut back substantially on their carbon footprints, help protect the planet and reduce their costs. Green IT has these three characteristics:

1. **"It must use energy efficiently"** – The cost of running equipment ought to be as important a consideration as the equipment's initial cost. Using energy-efficient equipment can cut your costs by as much as 20%. For example, a liquid crystal display (LCD) computer monitor uses one-third the energy of a cathode ray tube (CRT) monitor.
2. **"It uses the right size equipment for the job"** – Don't buy and run huge servers, for example, when smaller units would work just as well.
3. **"It includes the cost for the proper disposal of unwanted equipment"** – Disposal costs real money, especially if you become liable for cleaning up a landfill because you improperly tossed out electronic equipment.

Reduce Energy Usage

Cut energy costs by running your IT equipment efficiently. "Energy Star-compliant" equipment uses one-third the power of "legacy" units. Originally a U.S. Environmental Protection Agency program, Energy Star is now a performance standard in "the European Union (EU), Canada, Australia, Japan and Taiwan."

> "The cost of energy is the primary issue driving companies to 'green'."

The Electronic Product Environmental Assessment Tool (EPEAT), a U.S. government funded program, tells you how well the technology devices you purchase conform to "23 mandatory and 28 optional criteria." In addition to energy efficiency, these include the amount of "toxic materials in the device." In 2007, the U.S. government told federal agencies that 95% of the electronic devices they use must meet the exacting EPEAT standards.

> "In rough terms, for every watt of electricity used to power equipment in a data center, another watt is required to cool it."

The Advanced Configuration and Power Interface (ACPI) is another important power management performance standard, which has to do with operating system efficiency. The ACPI standard has largely replaced the older Advanced Power Management (APM) standard. Computer servers, in particular, benefit greatly from "ACPI power management."

No Dumping

Governments, especially local ones, are becoming increasingly involved in regulating the disposal of technology equipment. In the U.S., individual states regulate "electronics recycling, reuse and recovery programs." For example, California's Electronic Waste Recycling Act requires the price of all applicable electronic units to include e-waste fees of $6 to $10 per device.

> "Our surplus electronic parts are poisoning the planet."

Federally, the Resource Conservation and Recovery Act forbids the "open dumping of solid and hazardous wastes." Under the terms of the Comprehensive Environmental Response Compensation and Liability Act, the well-known U.S. "superfund" law, companies that dump hazardous waste must clean up any environmental problems they create. Numerous other federal regulations also affect toxic waste and other dumping.

> "Green computing is one of those things that many people favor but few want to work on."

Other nations have even tougher rules, and globally such regulations will only become more stringent. Therefore, include "end-of-life equipment" disposal costs into your "total cost of ownership" calculations for electronic equipment.

Whenever possible, recycle equipment instead of trashing it. Deal with responsible recycling vendors that follow pertinent governmental regulations about handling items that contain toxic materials. The Silicon Valley Toxics Coalition provides a list of "electronic recyclers that meet its standards." The Basel Action Network has its own list of "e-stewards," that is, responsible recyclers who agree not to export e-waste to developing countries. Whichever recycling firm your company uses, follow the example of former U.S. President Ronald Reagan: "Trust, but verify."

"The Business Case for Green Computing"

Many senior executives initially oppose green initiatives because they include new costs that do not appear to offer business value. Thus, going green may be a tough sell within your company. Develop a business case to educate senior executives regarding the problem of environmental degradation and sustainability in relation to IT operations. Break things down according to the three common green computing components: "energy consumption, disposal of surplus equipment and the purchase of efficient equipment." Measure everything. Calculate "units, watts, kilowatts, number of entire systems" and so on. These measurements enable you and company executives to understand the extent of the IT sustainability problem. Explain how saving energy will reduce the company's operating costs. Develop solutions based on these three factors:

1. **"Energy"** – Estimate the percentage by which energy conservation will reduce costs for all "desktop units and data centers."
2. **"New equipment"** – Calculate the percentage by which the smart purchasing of efficient equipment can "reduce lifetime operating and disposal costs."
3. **"Disposal"** – Explain how you would efficiently and lawfully dispose of all electronic components. Warn of the potential liability expense if the company does not follow a responsible disposal program.

> "Some manufacturers provide a "Take Back" program. Equipment sold by their companies can be shipped to a collection site for proper disposal."

Prepare a detailed execution plan that includes milestones and both internal and public information campaigns. Enlist the support of a high-level executive sponsor. Tie your green IT program to the company's "corporate social responsibility strategy." Going green is not only the right thing to do; it also gives your company a competitive advantage. Consumers prefer to deal with environmentally responsible firms. When you use green technologies, you can honestly promote your good corporate citizenship to the public.

Lean and Green

IT operations that are efficient use less energy and material, and produce less waste. To improve your company's efficiency, cut down on what the Toyota Production System calls the "Seven Wastes": "waiting, excess inventory, overproduction, unnecessary transportation, unnecessary steps, unnecessary motions [and] defective products." Develop "process maps" to identify areas where waste occurs.

> "While we might like to think our documents have everlasting value, the truth is that most documents have value only for a short period of time."

Hire a consultant to help you plan and implement a Japanese-type 5S methodology: "sort, straighten, shine, standardize and sustain." Audit individual departments after 5S implementation to ensure they are adhering to the process.

These and related steps will help you to streamline your work space, which translates into more efficient, less expensive operations. Label everything for quick identification so that employees can find everything they need. Remove cabinet doors. Pack up the outdated manuals and other items that are cluttering your IT department. Encourage employees to keep their newly reconfigured work areas clean. Sloppiness equals waste, and "waste is never green."

Green Has No Boundaries

Get out of your data center and examine all your company's operations, including its supply chain: its impact on the environment does not stop at the walls or gates of its property. Work with "suppliers and customers to reduce or eliminate the negative environmental impact of creating and using your products."

> "Total power used by servers represented about 0.6% of total U.S. electricity consumption in 2005. When cooling and auxiliary infrastructure are included, that number grows to 1.2%."

Use green suppliers. Ask them to provide you with an "independently verified certificate of compliance to ISO standard 14001 (the international standard for environmental management systems)." Cut down on packing materials and require suppliers to do the same, which will decrease not only waste but also transportation and materials costs.

> "E-waste is a complicated mixture of many different materials that can be difficult and therefore expensive to separate."

When analyzing your IT supply chain, isolate the most important processes and make a list of the items necessary to support them. Eliminate "safety stock," that is, the items you keep on hand for emergencies. Instead, improve the management of all IT supply chains, including hardware, software, office supplies (such as printer ink and toner), stationery, and other parts and equipment.

> "A green project forces the data center manager to think more strategically about where the computing needs of the organization are going, which makes him/her a more valuable member of the executive team."

Greening your IT supply chain will not be easy. You will probably meet resistance every step of the way. But it is the environmentally responsible, efficient and cost-effective thing to do.

Some Additional Steps

Take these additional small but worthwhile steps to green your IT operations:

- **Don't run equipment that is not in use** – The typical office worker is at his or her desk for approximately 1,900 hours per year out of a total potential 8,736 hours. Stop powering equipment for the 6,836 hours every year when no one is using it.
- **Cut back on paper documents** – Use electronic rather than paper files. Print only the documents that you truly need, and when you do, use duplex printers that print on both sides of the sheet. Don't print e-mails. Format documents so they use less paper. Use the "print preview" function to ensure that your documents are correct before you print them.
- **Search out green vendors** – Find suppliers who can deliver environmentally sound equipment.
- **Make your CPUs work more efficiently** – CPUs, or Central Processing Units, are small computer parts but big energy hogs. In fact, they use so much that they require special temperature regulation units. Comparing the amount of power different types of CPUs use is tricky because computer manufacturers all use different standards. Newer computers and other equipment have more energy-efficient CPUs, and you can buy software and hardware fixes for older ones.
- **Keep IT assets "out of the waste stream"** – Use equipment, including cellphones, as long as possible before getting rid of it. This increases your return on investment and reduces the down time employees require for learning new equipment. If one department can no longer use certain old equipment, move it to a department that can, or "donate end-of-life equipment to schools or charities."
- **Share hardware resources through "virtualization"** – For example, organize networks so that a "single physical server" functions as "multiple 'virtual' servers." Virtualization means less energy use and toxic waste, and cuts back on space requirements.
- **Keep data centers cool** – "Seal off cable cutouts" and "add ducted air returns."
- **Keep up with the latest technology** – In particular, watch for developments in solid-state RAM disk technology that uses "nonvolatile memory instead of a spinning disk platter." Such disks will have no "moving parts" and therefore need less energy to operate.

About the Authors

Lawrence Webber is an IT professional with more than three decades of experience. **Michael Wallace** is an information services professional with more than 25 years of experience. Both work in the commercial sector.