

Chapter 1

Win-Win Winning with Green IT

In This Chapter

- ▶ Seeing that green IT can work for you
 - ▶ Greeting the triple bottom line
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Greening IT won't be as painful as you might think. The information technology community has many straightforward opportunities to help solve problems affecting our environment just by doing what you do best — making informed choices and sound investments and using them to deploy quality solutions. These green choices and investments can save your organization money in the long run, and often in the short run as well.

You may have heard that meeting green needs in business requires sacrifice, belt tightening, and lost profits. These conditions may result when greening other business practices, but greening IT is different for two reasons:

✔ **IT suffers from inefficient practices:** We've been bad. In the rush to deploy the amazing advances in computing and communication, IT departments have adopted very inefficient practices. Simply put, they tend to throw hardware at every problem. The IBM Corporation estimates that for every 100 kilowatt-hours of electricity supplied by the power company to a typical data center, as few as 3 kilowatt-hours are actually doing productive work. The remaining energy is consumed by first powering and then cooling underused hardware.

Greening IT means finding better ways of storing and processing data, that recover much of that wasted energy. Cutting energy consumption, or at least slowing its growth, benefits the environment in many ways. And in many organizations, IT is the biggest single consumer of energy. So savings on the energy used in IT can have a big impact.

- ✔ **IT practices reach beyond department boundaries:** IT has the power to do more than simply green its own house. The influence of the technology that IT commands can help organizations find better ways to do business — reduce commuting and travel expenses, run buildings more efficiently, minimize the waste stream, and upgrade the supply chain.



Sustainability, corporate responsibility, and greening business practices have jumped from social movement to business imperative. Green IT is a dynamic, strategic, and ethical framework of practice for all IT. Green IT is about doing what it takes to be innovative, agile, efficient, responsive, profitable, and responsible all at the same time. Our goal is to help you bridge the gap between good green intentions and sustainable IT excellence.

In this chapter, we give you a big-picture look at going for green IT. In particular, we explain what we mean by the green IT ecosystem and show you all the areas that greening IT can positively impact — from energy and cost savings to better relationships with customers, business partners, and your organization's staff. You also find out quick ways to start green practices and basic green IT concepts that help you identify how to help your organization go green.

We're Talking to You

We admit it. The whole issue of green can be polarizing. But regardless of your views on environmental issues and global climate change, we know this book has something to offer you. Find yourself in the following list — or discover that your views fit with more than one depiction. In either case, find out that the topic of this book has aspects that are important to you whether you're

- ✔ **An environmental activist:** You're rearing to go. You want to make a difference. Feel free to skip the rest of this chapter and dive into the meatier parts, where we tell you good places to get started with your green IT initiatives. Or review the issues here to arm yourself for the inevitable discussion with less-committed colleagues.
- ✔ **An open-minded skeptic:** This chapter is especially informative for you. We try to make clear why global climate change and other environmental concerns are among the most pressing challenges of our time and why you — as an IT professional — are in an ideal place to help meet them.



- ✓ **A total disbeliever:** You're sure global climate change is a lot of tree-hugger baloney and no yellow-and-black *For Dummies* book is going to convince you otherwise. You're in business to make money, period. That's the only bottom line that matters. You might want to skip the rest of this chapter, too; it may only raise your blood pressure.

But consider this before you go: Ignoring the ideas in the book will cost you money. Pretty much everything we talk about reduces expenses.



And like it or not, additional environmental regulations are coming. You can spend a lot of money at the last minute to meet them or you can get ahead of the curve by investing in green IT initiatives now. Do so, and your business will be ready — when the regulations come — to comply with minimal added expense. Let your competitors waste their time and money later, scrambling to comply. Green is good business.

Recognizing the Basic Green Concepts

Before you go too far, make sure you understand what we mean by green. Green is commonly used as shorthand for a group of related concerns:

- ✓ **Environmental responsibility:** The need to consider the well-being of the environment and protect the health, balance, and diversity of human and natural resources.
- ✓ **Global climate change:** A specific concern that human activity is contributing to a buildup of greenhouse gases in Earth's atmosphere that is slowly increasing the average temperature near Earth's surface.
- ✓ **Sustainable development:** Defined by the United Nations' Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Much of the material and energy used to make things (you know, books, bikes, bags, boats, and billiard balls) comes from limited supplies of natural resources (such as paper from trees, aluminum and steel from ores, plastic from petroleum, and so on).
- ✓ **Corporate Responsibility (CR):** How businesses extend their sense of responsibility to consider the well-being of society and the environment with an understanding that global societal, environmental, and economic challenges are interrelated and that everyone depends upon one another for not only success but also survival.

Awareness of and worry over climate change, energy crises, rising energy costs, and the dangers of hazardous materials in society are growing. These issues have people, governments, and organizations of all types talking, and many are having a difficult time trying to figure out what to do about them.

With the advent of blogs, wikis, and social networks, organizations are increasingly under the eyes of (and subject to) the opinion of a world that's watching to make sure they're doing the *correct thing*. Remarkably few opinions can have a remarkably large impact when it comes to creating buzz — both positive and negative. So in a world where everyone's watching, you can't assume no one cares how your business comports itself.

Green and IT — A Good Fit

Information Technology — IT — is the central nervous system not only of our businesses, but also of our governmental and social infrastructure. In fact, IT connects the globe. Records are computerized, traffic is controlled, and paychecks are issued, all courtesy of IT. In many parts of the world, completing daily activities (such as writing e-mail for work or doing research) and conducting daily business (such as running a retail store) depend entirely on IT. IT depends on electricity, and available electricity is finite. As IT continues to grow, we depend more on it. Its unchecked consumption of power is threatening the financial resources of the organizations it serves, and, quite literally, is putting an ultimately unsustainable burden on the earth.

We must find a way to green IT. Industry leaders recognize this fact — look at IBM, Cisco, Sun Microsystems, APC, HP, Dell, and EMC. These companies are continuously examining and improving their own practices to make themselves green. They create products that are more environmentally friendly and energy efficient for their customers, as well as work collaboratively with organizations like The Green Grid, which focuses on helping the IT industry address energy use. (See the sidebar “Meet The Green Grid,” later in this chapter.) But you can't throw a switch and suddenly be green. *Going green* is indeed a process and just the beginning of the efforts required for true sustainability. Still, going green may also be the shortest route to economic savings and the overall health of an organization.

While the greening of IT is being driven by a demand for energy conservation as well as an increased awareness of conservation's impact on the planet, going green is often complicated by real business circumstances. That is, organizations' green efforts are commonly challenged by inefficient legacy business practices, ever-tightening budgets, and no process for measuring or tracking performance.



At the end of the day — ready or not — clients, customers, peers, employees, bosses, governments, watchdog organizations, and your own facilities and operations management will be demanding that IT go green. And here's the good news: Several factors put IT in an excellent position to contribute:

- ✓ **IT uses a lot of resources.** In many organizations, IT is the biggest consumer of electricity. Efficiency improvements have a real impact.
- ✓ **IT turns over its equipment every 3-5 years.** Capital equipment in other departments lasts much longer, so greening new investment can require decades to take hold. Not so in IT.
- ✓ **Technology is IT's second name.** IT folks know how to navigate complex technical criteria and make informed decisions. Green is just one more factor to consider.
- ✓ **What IT *does* is inherently green.** Data is nonpolluting, in and of itself. Virtual travel — and the accompanying virtual meetings, virtual client visits, and so on — takes relatively little energy. The right-of-way for an information superhighway is a very narrow trench that can be covered back over with grass. Along the way, however, we need to remember the enormous energy being consumed by IT — on a par with the airline industry. Studies being done to measure the weight of Internet searches and the impact of sending data back and forth will show that IT is not carbon neutral.



We address green data storage in Chapter 11, later in this book

As IT professionals, your responsibilities and opportunities grow under green. Your networks are in the right place at the right time. IT does more than just deliver YouTube videos and Facebook profiles around the office. IT can sense temperature, humidity, and air flow, and use that data to tune the building's mechanical systems for optimal performance. IT can open and close shades to take advantage of passive solar heating. IT can adjust non-critical power demands to follow the output variation of alternative power sources such as wind and *photovoltaics* (what most folks think of as solar energy).

Embracing Trendy Hooey

For a long time, green considerations have been categorized as faddish and not having real business merit. Much of what we talk about in this book has direct, budget-stretching benefits. But going green affects more than your company's financial statement. For most organizations — including for-profit, not-for-profit, and government — few things are more important than public perception, trust, and reputation — summed up as *brand value*.



Instituting and promoting a credible green program enhances your brand and can help heal brand damage caused by past environmental neglect.

Looking beyond cost savings

Just looking at the economics of going green — saving a lot of money by being more energy efficient, increasing efficiency in your business processes, and improving people- and IT-assets management — would never be called hooley.

In addition to reducing costs, good green IT practice can also do such things as

- ✓ Reduce and optimize energy use
- ✓ Increase efficiency, performance, and lifespan of hardware, applications, and other assets
- ✓ Reduce the amount of hardware needed
- ✓ Increase workforce efficiency and performance
- ✓ Reduce floor space in the data center
- ✓ Reduce air conditioning needs
- ✓ Reduce carbon/greenhouse gas emissions and environmental pollution
- ✓ Reduce the need for additional facilities
- ✓ Reduce risk and liability
- ✓ Reduce exposure to deadly toxins and hazardous materials from e-waste by emphasizing reuse, recycling, and biodegradability
- ✓ Deliver technological aids to those who need it through donation and reuse programs
- ✓ Enable collaboration and increased productivity
- ✓ Inspire and motivate people
- ✓ Improve work-life balance

This holistic approach to responsible and highly efficient IT practice is what distinguishes green, sustainability, and corporate responsibility from just plain cost cutting and performance optimization. Green IT-focused organizations define value and success through a greener, cleaner lens that considers its impact on society and the Earth in addition to its positive impact on profit and organizational productivity.

Getting the good will of partners, customers, and employees

Jhana, Jeff, and Carol work for a research firm. We have evidence from the research we've done that consumers (and businesses) would prefer to spend their money with companies doing their part to address green matters, and that employees prefer to work for such companies. All constituencies contribute positively to the organization's brand:

- ✓ **Business partners:** Responsible companies are looking to partner with other responsible companies in creating their own *green value chain* — choosing green suppliers and business partners interested in creating a sustainable world.
- ✓ **Customers:** Brand preference is all about giving buyers *reasons* to buy from you. Establishing your business's green efforts and creating an environment of transparency can be one of those reasons.
- ✓ **Employees:** For organizations interested in recruiting and retaining top talent, the commitment to corporate responsibility is proving a big draw. Your organization's future depends on its ability to attract new talent to its workforce. Young people today are keenly aware of environmental challenges. Surveys show that the best college graduates prefer to work for firms where they can contribute to green action or at least be part of a team that is moving in the green direction. One survey found that college grads would accept a \$13,000 lower starting salary to work in such an organization. The recruiting potential of a strong green program is a real competitive advantage.

Focusing on the triple bottom line

More and more, governments are looking at ways to reduce carbon emissions and energy usage. The ability to reduce energy consumption with its rising costs while simultaneously increasing efficiency is music to the ears of any organization.



Green IT doesn't focus only on *the* bottom line. Instead, it involves commitment to a *triple bottom line* — a way of measuring organizational success by how positively these initiatives impact *people*, *profit*, and the *planet*.

You're no doubt familiar with the term *win-win*. Win-win replaced *win-lose* when somebody figured out that you can actually come up with solutions that benefit both sides of a scenario. When it comes to green, we take it one step further. With green you have the possibility of a *win-win-win* scenario where three constituencies, often pitted against one another, can all win.

Too often being green is seen as too costly for business. What people want is thought to be at odds with what's good for the planet. Yet with green IT, all three — people, profit, and the planet — stand to gain, a veritable win for the triple bottom line. The triple bottom line speaks to a win for the business (economic), a win for society (social), and a win for the environment.

Think about how the benefits of greening IT (and your organization as a whole) reflects a culture of corporate responsibility — the triple bottom line — as follows:

- ✔ **We the people:** As organizations become more responsible and efficient, they reap the rewards of better relationships and reputations. Organizations report that they improved their stakeholder, client, and community relations, which in turn, increased the loyalty and satisfaction of clients and employees alike.

Employees often say that organization-wide communication, collaboration, and innovation have improved as a result of their sustainability initiatives. Every time we talk to folks within organizations whose jobs focus on green, they tell us how great they feel about what they're doing and how important it is.

- ✔ **Planet Earth:** Greening IT helps reduce emissions and pollution levels with the reduction of energy consumption and a shift to cleaner renewable energy. In addition, greener IT also contributes to a reduction in toxic landfill waste by encouraging recycle and reuse programs as well as the production of biodegradable components. Green IT's focus on overall efficiency in material use — and a getting away from the planned obsolescence (for which the tech world is famous) — further supports a responsible approach to IT by reducing environmental impact.

- ✔ **Greener profit:** Not only are organizations able to dramatically lower their energy costs, boost overall efficiency, avoid major disruptions, and optimize the longevity and functioning of costly assets, but they also become preferred tech providers, develop innovative solutions and services, and increase market share.

With all the environmental regulations already in place (or coming soon), keeping ahead of changing mandates allows organizations to focus on reducing risk, liability, taxes, and penalties. All of these benefits improve competitive advantage, enhance brand value and reputation, and contribute to an effective collaboration and communication strategy within and outside the organization.

Greening the IT Ecosystem

An *environmental ecosystem* refers to the way living organisms are inter-related and codependent on one another and the entire physical complex of the environment. The IT ecosystem includes networks, the Web, and an interconnected and dynamic relationship map that shows how various components influence and impact other components.

The *green IT ecosystem* represents a way of thinking holistically about what, how, and why IT operates — and about who and what their operations impact. The components of the IT ecosystem include

- ✓ **All computer hardware, software, and networks** used inside an organization
- ✓ **Management strategy** responsible for purchasing, implementing, running, and disposing of or donating hardware when no longer needed
- ✓ **The people and organizational culture** that makes all the infrastructure and activities in the preceding bullets possible
- ✓ **The systems and networks** that connect with the organization's suppliers, customers, and partners



IT's conspicuous consumption

In case you're not convinced of the green concerns around IT, consider these facts:

- ✓ Current data-center energy bills total more than \$7 billion a year and are rising sharply.
- ✓ Information Technology energy demand is growing 12 times faster than the overall demand for energy.
- ✓ In typical data centers, each 100 units of energy production drives (on average) only 3 units of productive computing.
- ✓ Data centers consumed 180 billion kWh in 2007 and will double in the next three years or so.
- ✓ Data centers emit over 150 metric tons of CO₂ per year, and the volume is increasing rapidly. (As a point of reference, a car produces 18 pounds of CO₂ for every gallon of gasoline it uses.)
- ✓ Governments worldwide are moving to enact legislation to track and limit carbon emissions.
- ✓ According to the United Nations Environment Programme (UNEP — www.unep.org), humans discard 20 to 50 million metric tons of computer-related equipment — e-waste — worldwide each year, which represents 5 percent of all municipal solid waste.
- ✓ Additional toxins, hazardous materials, and e-waste are generated to make IT products.
- ✓ By 2010, there's the potential for one billion computers worth of e-waste.

You need to figure out how to look at the IT ecosystem through those rather snazzy green glasses because IT has a big impact on the environment, your organization's profitability, and society (including you). The goal of this book is to help you figure out how you can make effective changes to your organization's IT both for your organization's own goals and to do your part in helping to lead the IT industry into a greener, healthier, and more efficient world.

A Perfect Storm: Why Green IT Now

Many pressures drive the greening of the IT ecosystem but the main elements can be boiled down to the political, economic, and societal. Organizations and individuals decide to be more responsible, sustainable, or green for different reasons. Instead of getting caught up in the deeper motivations, we simply explain why creating a green IT ecosystem offers a path that creates a win-win-win situation for organizations, society, and the environment.

As organizations focus more on understanding their challenges in going green, IT managers will likely be required to understand the scope of the overall issues and come up with a vision and a strategy to address them.

Knowing the green business drivers

For many organizations, going green is exclusively about the explicit business drivers such as cutting costs or reducing power requirements.

- ✓ **Energy costs:** IT gobbles energy and greening IT can dramatically reduce energy costs. According to the Global e-Sustainability Initiative (GeSI — www.gesi.org), the IT industry could save global industry \$800 billion dollars in energy costs by 2020.
- ✓ **Energy availability:** In some locations, the borough of Manhattan in New York City, for example, new power feeds are difficult or impossible to obtain. The efficiencies inherent in Green IT can delay or avoid the need to expand data operations and move them to remote locations.
- ✓ **Equipment costs:** Greening IT optimizes business processes by consolidating servers and storage, which often results in needing less equipment.
- ✓ **Data center costs:** Current trends show data center capacity needing to double every five years. Greener IT can slow the need for expansion as well as reduce the demand for floor and rack space and air conditioning.

- ✓ **Business process optimization:** Optimizing business processes including supply chain management represents a huge opportunity for managing carbon emissions with such solutions as shipping logistics planning, among others.
- ✓ **Performance and efficiency:** Many of the steps you take toward green yield a more efficient, better performing IT. Go figure.

Recognizing environmental drivers

Carbon dioxide is one of the major human-generated greenhouse gases that Intergovernmental Panel on Climate Change (IPCC) has concluded is very likely responsible for observed increases in temperature over the last 60 years. Additional temperature increases — with serious consequences for the environment — are projected over the next century if we don't reduce greenhouse gas emissions. The United States is a huge producer of greenhouse gases, and levels of carbon emissions from emerging markets like China and India are accelerating.

In addition, discarded electrical components and electronics (to be distinguished from recyclable units which, properly handled, are considered a commodity) become *e-waste*. You can find the mountains of e-waste that are being disassembled and picked over — at high risk to the pickers — after being dumped in places like China, India, and Nigeria.

IT departments need to take these environmental drivers into account and consider the following when devising green IT strategies:

- ✓ **Carbon emissions:** In the U.S., coal provides more than 50 percent of our electrical power. A single office desktop computer and display might consume at least 100 watts of power per hour, or 2.4 kW-hours per day, when left on continuously. The coal needed to generate just that much energy 24 hours a day for a year is about 714 pounds. And burning that much coal releases, on average, 5 pounds of sulfur dioxide, 5.1 pounds of nitrogen oxides, and 1,852 pounds — almost a ton — of carbon dioxide. One little computer.

While IT generates tons of carbon, it can save even more tons. For example, transportation accounts for almost a quarter of human carbon dioxide emissions worldwide, and more than a third of that comes from North America. IT can reduce the need for transportation by replacing business travel and daily commuting with telepresence and telework (see Chapter 20).



✓ **E-Waste:** E-waste is filled with hazardous materials like cadmium, mercury, lead, carcinogenic PCBs (polychlorinated biphenyls), and many elements that are not biodegradable and can leach into water and soil. For more about e-waste and efforts to address it, check out the Basel Action Network, www.ban.org, a global organization focusing on addressing the horrific impacts of e-waste, including the unscrupulous dumping of toxic waste on the world's poorest peoples. Find out more about dealing with e-waste in Chapter 19.

Feeling the governmental pressures

Government and advocacy groups around the globe are grappling with environmental concerns. Some governments are ahead of others in enacting laws and regulations. But it's one world, after all, and legislation passed on one region impacts others as businesses reach across borders.

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH)

In December of 2006, the European Union enacted, EC/2006/1907, the Registration, Evaluation, Authorization, and Restriction of Chemicals regulation, which addresses the impact of various chemical substances (including a subcategory called SVHCs, or Substances of Very High Concern) on human health and the environment. In force since 2007, REACH will be implemented in phases through 2017.

Any organization importing certain chemicals or articles containing the chemical substances into the EU in amounts of more than one *tonne* (a metric ton) per year must register them with the European Chemicals Agency. (Check out the ECA's Web site at http://echa.europa.eu/reach_en.asp for more about REACH.)



Failure to register the restricted imports will result in being closed out of the market (in REACH-speak, “no data, no market”). Continued use or import without authorization is illegal. REACH is considered one of the strictest regulations given its impact on the way that manufacturers, retailers, and IT organizations do business and function day-to-day.

RoHS

The European Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment 2002/95/EC — usually known as the Restriction of Hazardous Substances directive (RoHS, often pronounced: *roh hahs*) — is a subset of WEEE. This European directive, covering Waste Electrical and Electronic Equipment and its disposal, includes restrictions on the use of certain hazardous substances in electrical and electronic equipment.

RoHS focuses on the beginning and middle of the electrical and electronic life-cycle by defining what shouldn't go into the components being made and repaired. Since July 2006, most equipment containing components with these hazardous substances can no longer be sold in Europe. For more on RoHS check out Chapter 4 and <http://www.rohs.eu/english/index.html>.

Cap and Trade Legislation

Cap and Trade, or *emissions trading*, refers to a centralized strategy to control and reduce carbon emissions by limiting or capping the total amount of greenhouse gases that an entity can emit. Entities have credits, which reflect the total amount of carbon they can emit. Low emitters may sell their credits to those who go over their allotted allowance. This method of charging offenders for pollution begins with designating a value per tonne of carbon emitted (tC).

The trade in carbon credits provides financial incentives for organizations to lower emissions while working toward the goal of reducing overall emissions to the capped total. It also induces organizations to improve conditions in the developing world by encouraging investment in projects that earn them credits.



Cap and trade legislation will likely drive up the cost of energy, and carbon-free energy sources such as wind, solar, hydro, and nuclear power will become more attractive. When the single biggest cost of the data center is the electrical bill, you can bet that cap and trade will affect data center operations. When deciding where to build a new data center, IT managers will need to carefully consider the cost and availability of power. Also, if organizations with green initiatives can earn carbon credits, greening IT could prove important in a landscape eager to trade.

Staying the Course: The Do's and One Don't of Going Green

Going green isn't new — some folks have been working at it for decades. In this section, we share some specifics from their efforts with the hope that you can learn from their experience.

Do remember the big picture

Greening IT is about more than data center efficiencies and cost reductions. Greening IT requires a comprehensive look at areas of the organization that typically may not be considered part of IT. For example, you should consider where and how people work (workspace and work hours) as well as the systems they work on.

Organizations need to understand the impact of not only their own behaviors, but also the impact of the behaviors and conditions of their extended network of partners. Consider how the whole ecosystem works together: infrastructure, facilities, applications, networks, processes, employees, partners, suppliers, purchasing, reuse, and end-of-life management. Getting your green vision and strategy right require a holistic, innovative, and responsible approach.

Do have a champion and a team leader

A lot of people will have good ideas about the strategies and processes for going green, but nothing's likely to happen without sanction and direction from above. Your organization's green mandate must be clear. You'll probably work collaboratively — in a cross-department, cross-functional team — to arrive at that mandate, but strive to get your organization's direction clear and empowered to make real change.



Having an executive champion for green initiatives is important, but establishing a cross-functional team that works collaboratively is probably better. Green and sustainability shouldn't be lead from the top, but visible executive support is critical. So give your executive champion the support that teams need to accomplish your organization's goals.

Do measure so you can manage

The success of greening IT depends on being able to quantify and demonstrate improvement. This process, known as *performance management*, not only enables visibility into progress and challenges, but also helps uncover areas of opportunity.

Follow these general steps to set up a system for managing the performance of your green initiatives:

- 1. Determine the metrics most meaningful to your green initiative.**

For example, you may be most interested in energy usage, system uptime, energy cost, miles of business travel, and so on.

- 2. Measure your current, pre-green levels to establish a baseline.**

Taking these baseline measurements helps you understand where you are and serves as a comparison point for monitoring progress.

- 3. Set performance goals for your chosen metrics and establish a process for tracking and measuring against the baseline measurements.**

4. Track and communicate about your progress and further challenges.

Use the tracked results to evaluate the success of your green initiatives and make adjustments as needed.



Successful green IT programs require a team effort. Recognize achievements at the department or team level, and, if possible, consider incentives that can work to spur friendly competition and innovation that support the greening process.

Do talk about it!



We can't overemphasize the power and importance of communication. Leverage newsletters, calls, and social networking platforms to catalyze collaboration and communication.

Organizations can create a shared sense of purpose and achievement when there is a regular flow of communication around green agendas. Consider these points when you establish communications processes to use in conjunction with greening IT:

- ✓ Keep communication positive and productive and remember that good ideas can come from all levels of the organization. Collaboration within and beyond your typical organizational borders will stimulate innovation and creativity.
- ✓ Discussing progress and challenges with internal stakeholders monthly is a great way to share best practices and maintain momentum for green initiatives.
- ✓ Communicating regularly with external stakeholders, clients, peers, and others helps generate good ideas, connection, and enthusiasm for the organizational goals. Thought-leading organizations are looked to by their peers and even by those in other sectors for inspiration and best practices.

Do remember the community

Green IT initiatives benefit the environment and the bottom line, but they also should have sustained benefits for the organization's community at large. Encourage connecting the skills, interests, and goals of the organization to the needs, goals, and interests of the local and global community by supporting volunteer and philanthropic activities of your colleagues, company, and partners. Find schools, programs, and nonprofits to which you can

donate materials, technology, expertise, funds, and time. If your organization changes computer equipment constantly or can extend connectivity or training, find a project in need and collaborate.



There's a need for philanthropy but there's a greater need for organizations to see that they are, in fact, members of a community and that prosperity and value comes from shared success and genuine, not generous, engagement. Investment in communities near and far is an investment in the long term and sustainable societal *and* business ecosystem.

Green IT is just as much about changing an organization's culture as it is about changing its technology and operational processes. This refocusing on the people who make green IT practices happen means never forgetting that people — not products — are at the center of the IT ecosystem.



Investigate effective and, ideally, fun ways to get your employees engaged, trained, and supported in the effort to go green. Involve them in cross-functional, collaborative exercises that encourage creative, innovative, and proactive problem solving. Once you have a critical mass of your people *thinking* green, adopting greener processes is far easier.



Along with copious communications about your green IT efforts, encourage collaboration internally and externally, with partners, peers, and even with groups from other sectors. Collaboration not only improves visibility of what is happening, but it also allows agility and innovation as it better connects with stakeholders and allies.

Don't tell green lies!

With all the green hype, many people get cynical about green initiatives. With so much pressure to go green and so much confusion about what that even means, it's no surprise that organizations can get demoralized before an initiative even gets started, let alone when it runs into challenges along the way.

Avoid telling green lies:

- ✓ **Tell the truth about your green commitment:** Communicate that greening the IT ecosystem will be a constantly evolving process that needs to be regularly re-evaluated and adjusted. Remember that going green is an ongoing journey toward the larger journey of sustainability.
- ✓ **Tell the truth about your methods:** Your organization needs to be *transparent* — not hiding nefarious processes. No organization is perfect. Your organization can best avoid being slapped with a *green washing* label (just pretending to be green) if it makes genuine efforts to increase visibility into and take responsibility for its actions, products, and services.

- ✔ **Tell the truth about your green results:** Don't overstate successes or downplay challenges and areas that need improvement. Like it or not, what organizations do and don't do is extremely visible to the rest of the world with information on the Web, traditional news outlets, and employees, partners, suppliers, and customers talking.



Work hard at going green, but try not to take yourselves too seriously.

What to Green Now and Later

Although the rising green tide of corporate responsibility is driven by complex factors, the greening of IT happens in ways we expect — increasing energy efficiency in the data center, for example — and in ways we might not expect — reusing and purchasing IT equipment with a mind to safety and recyclability. The greening of IT is an ongoing *process*, an approach, and a mode of operating; it is not a destination. Using this approach, you do the best you can with the resources you have, and you make adjustments as information, budgets, capabilities, and priorities change.



The greening of IT is a *process* that includes educating people, framing your visions and decisions, and adopting a set of practices and technologies, in a way that has *genuine* and *concrete* positive outcomes to your organization, society, and the environment. From data centers and desktops to telecommuting and from Web collaborating to donating old equipment, greener IT will positively impact practically every aspect of your organization, as well as society at large.

The ongoing green process involves continuous learning, adjustment, and improvement. A boat load of low-hanging fruit in IT will quickly get you on your way to being greener. Some things are as simple as increasing awareness and changing little behaviors — adjustments that are pretty easy to implement:

- ✔ Turning off things such as your monitor and printer.
- ✔ Weeding out low- or nonperforming components (for example, applications that nobody really uses but are running on servers anyway).
- ✔ Plugging holes in the data center — such as mixing cold and hot air — that make your cooling units work harder.
- ✔ Selecting hardware products according to energy-efficient criteria; look for Energy Star ratings, for example, where they apply.

These easy-to-green things are what plain old good IT management should recognize, but they're often missed. This book covers both the easy fixes you can do immediately as well as initiatives that take careful planning and roll out over time. We give you concrete places to start your green IT journey in Chapter 6.

Evaluating your starting point

Getting your green journey under way isn't difficult and doesn't even have to cost a thing before you start seeing great benefits. Going green is about adopting responsible frameworks for the often complex, dynamic practices and objectives for the long haul — not chasing some green myth of perfection.



The easiest way to start doing something green is to increase your awareness of how your current practices *aren't* green and identify ways to decrease the negative impact and wasteful actions. Finding out how businesses, individuals, and groups of committed people can impact the world for the better is an important element to green IT success. If people feel that their non-green situation is too far gone or too overwhelming, they may have difficulty committing to the longer journey.

Communicating a can-do green attitude

Though the green IT story is about more than energy efficiency, it is still a central theme of any organization's green agenda. By getting a handle on your power consumption, you can really pack a wallop on your organization's carbon footprint. The green IT initiative can drive a great number of benefits to the organization as a whole by helping it become less wasteful and more mindful of energy usage. IT can empower its people by educating them on the power of simple changes in attitude and behavior.



Remember to do the following when scoping out your green IT program:

- ✓ **Make it visionary and clear:** Connect your immediate, measurable goals to the overall values of green, sustainability, and corporate responsibility. Don't treat green initiatives as marketing ploys or philanthropy. Articulate clear goals and standards for the organization.
- ✓ **Make it comprehensive:** Get beyond the data center to include other key elements of the IT ecosystem, such as applications that support digital information exchange to reduce paper. Take a lifecycle approach to the organization to examine what your organization buys, how you use your IT equipment as well as your building facilities, and how you dispose of waste. Make sure that everyday practices and policies support the transformation into a more sustainability-driven organization. Greening your organization can't be a separate, ad-hoc program.

- ✓ **Build bridges:** For a successful sustainability agenda to take effect, make sure that separate functions like design, purchasing, IT, finance, and the supply chain start working together and are visible in each other's activities. By basing green success on a foundation of communication and collaboration, organizations are more responsive to changing needs.
- ✓ **Push for an executive champion:** Adopting sustainability and corporate responsibility is best undertaken with a top-level supporter who can oversee a cross-functional team. An executive champion can ensure the communication, coordination, implementation, and effective performance tracking and sharing of the best practices of your green initiatives.

Greening office culture

People are the central expression and driving force of any complex initiative, and this is especially true of greening your IT. Successful initiatives engage an organization's stakeholders and partners and elicit commitment. The simplest way to get that passion and engagement is by talking to people and getting them talking about what they care about and what they don't care about. Stakeholders may want to go green for diverse reasons:

- ✓ Worry over the climate and environmental activism
- ✓ Need to lower costs because their work performance is judged by budget management
- ✓ Desire to feel good about their workplace and its efforts to lessen its societal impact
- ✓ The challenge of catalyzing innovation to build competitive advantage
- ✓ Wish to improve the work experience by focusing on the efficiency of its technology and daily processes
- ✓ Concern about national security and energy independence

Knowing context, and understanding where people come from, will help you craft your green mission in language that resonates with the passions and goals of your greatest resource: your people.

Plucking the low-hanging fruit

You have the energy and engagement to implement the vision. Now what? Post-prioritizing is a great time to see exactly where you are in the game. It's not very useful to say you're more energy efficient if you have no idea how energy inefficient you were before.



Vague ideas of progress can stymie real progress and so establishing a performance baseline is the first and most important step at the outset of any sustainability initiative.

✓ **Look around at your technology.** Know what equipment and products you have. Read their labels and spec sheets to determine any certifications they may have, such as the EPA's Energy Star. This assessment helps determine an action plan and responsible framework for planned purchases and coming equipment retirements. Energy-efficient choices often exist for most budgets.

✓ **Find out what your energy costs are.** Get as granular as you can to understand how much energy your organization uses and, if possible, by which offices and facilities. Perhaps the utility company or facility managers can help you figure out energy usage patterns? Set up a team to examine power usage habits:

- Do people typically leave computers turned on when they're away for extended periods?
- Are computers at the most energy-efficient settings possible? Are unneeded processes running? Are the screens at maximum brightness; do they really need to be?
- Are power strips left filled with chargers and other unused devices? Can they be turned off?
- How much natural light can you take advantage of? Which offices, rooms, or areas could have the lights turned off until needed?
- Are you using energy-efficient lighting? See Chapter 17 for simple ways to identify lighting types.

If you can't get access to real costs, estimate with the help of online tools — many of them free — to get a rough sense of what x number of servers or computers running x number of hours might be costing in your region. Do any organizations or university research units offer free support to companies trying to be more responsible?

✓ **Find out what you're wasting beyond power.** Look around offices and visit your organization's waste-collection area. What's the situation with recycling, and what percentage of paper is wasted? Speak to people and observe the norm regarding paper, copies, and prints. (How often are printed items not retrieved? How regularly is email unnecessarily printed? Do people print on both sides of the paper? What other items could be recycled?) If your organization pays to carry away trash, see if you can get a sense of the costs and patterns of your waste habits and raise awareness there as well.

✓ **Investigate your company's policies for business travel and daily commuting.** Is all the business travel necessary? Can your company support work from home? Figure out how much energy and productive time

could be saved by allowing more virtual meetings and telework initiatives. How much could be saved by more efficient use of office space and resources?

- ✓ **Consider putting green queries into your RFP/RFI process.** Reach out to your partners and ask them to tell you what their organization is doing to be more responsible. Seek support and best practices from your peers, and even from other industries. A great deal of information is available online and from U.S. government sources like the EPA and Department of Energy. If your organization has a transport or logistics component, consider responsible programs like the EPA's SmartWay.
- ✓ **Understand which processes can be paperless and explore which documents can be digitized.** One quick way to jumpstart a paperless office is to make any organizational forms and guidelines available online. Get the organization off of junk mail lists. Review your office supply choices. What amount purchased is made of recycled content? Work on improving the ratio. There are great Web sites for greener office products:

www.thegreenoffice.com

www.quill.com

www.dolphinblue.com

Knowing where you stand will help you set real goals and track performance. You make an impact simply by making people aware of their own behavior on energy and waste; that awareness can alter organizational culture. Done right, people will not only shut off lights and equipment as second nature but often start to suggest other innovative ways to save energy, money, and the environment — both at work and at home. Organizations of all types have reported that as work behavior becomes more thoughtful, so does home behavior, reducing costs and increasing efficiency there as well.

Many areas are prime for immediate greening — even with little or no budget to speak of. Make eliminating waste a central tenant of your first green year. See Chapter 6 for details on establishing baseline and an action plan for the next 12 months.

Cultivating green education and communication

Once you've established your baselines and objectives, and cross-functional teams are collaborating across the organization, you need an action plan that individuals at every level can implement. You'll need to spark some serious awareness raising, education, and goal setting with your stakeholders and partners:

- ✔ Institute education plans about overall vision, goals, and steps for the entire organization as well as role-specific guidelines for excellence.
- ✔ Set clear standards of where the organization is trying to go and appoint performance standards and metrics for individuals and departments to be measured against.
- ✔ Create incentives for leadership and innovation in the form of bonuses and recognitions.
- ✔ Start a company e-newsletter to report progress and challenges on a regular basis. Allow social networking and Web capabilities to help your stakeholders connect and inspire one another. Encourage innovation and creativity perhaps through blogs.

Innovating through the supply chain

Much like IT, the supply chain represents a bounty of quick green wins. What is a supply chain, you ask? A *supply chain* is the network of suppliers (the organizations that supply the things — goods or services or people — that another organization needs) and trading partners with whom an organization works to find raw materials; buy, make, and transport products; or deliver services. It includes all the resources, people, facilities, companies, and distribution hubs involved directly and indirectly in production. Supply chains are often complex, layered, and global, making them more supply *networks*.

Organizations embracing sustainability are looking for more responsible suppliers and partners. The greener supply chain's positive impact on IT assets, infrastructure, efficiency, business processes, opportunities, and costs are exponentially felt across a more integrated, efficient, and collaborative organization. From virtualized servers and desktops, to energy-efficient products and processes and recyclable components, greening the supply chain delivers a bevy of efficiencies and opportunities for the entire organization.

Sustainable supply chains offer many opportunities for increased materials efficiency, which result in:

- ✔ **Reduced waste:** Moving to paperless processes across the organization facilitates data sharing, integration, and storage; it also reduces an incredible amount of waste going into landfills. It also frees up office space that would otherwise store all that paper.
- ✔ **Energy savings:** What you do as an organization counts and as a result, more requests for proposals (RFPs) and requests for information (RFIs) include questions on a potential partner's environmental or social performance in addition to its ability to deliver products, solutions, or services in an efficient and cost-effective manner.

- ✔ **Increased productivity:** Sustainable supply chains positively impact the entire organization because greener choices in the purchasing of materials, services, and products create benefits in every other phase of asset and material implementation, use, management, and retirement. Furthermore, sustainability-driven supply chains are more resilient, less risky, more agile, and more responsive to their clients and partners.
- ✔ **Improved planning and demand management:** Providing operations management within the supply chain gives more insight and visibility in business processes as they impact the environment, thus allowing you to make more eco-conscious day-to-day decisions. Using carbon trade-off modeling for transportation planning and routing allow you to choose the lowest carbon-emitting mode of travel within the constraints of the service-level agreement.
- ✔ **More effective collaboration:** An enhanced logistics network can more easily get and distribute materials and products to the right places at the right time and in the right amounts. More efficient planning helps reduce transport costs, and allows for better usage of space.
- ✔ **Improved storage, handling, and recovery:** Avoiding hazardous materials whenever possible also helps lower:
 - Training and handling costs associated with their use
 - Costs associated with their storage and disposal
 - Specialized materials tracking and reporting requirements

By shifting from hazardous materials purchasing to hazardous materials services, companies can partner with other organizations that can source, deliver, track, and dispose of the materials in an efficient and responsible manner.

Meet The Green Grid

The Green Grid (www.thegreengrid.org) is an organization of some 200 member companies taking a leadership role in helping IT users improve energy efficiency in business computing environments, including but not limited to data centers. The Green Grid is actively creating models and metrics, measurement methods, best practices, and processes to work in conjunction with related developing standards. Continuously working to improve all these areas across the globe, The Green Grid collaborates

with government organizations, IT end users, and others to ensure that their recommendations align with policies and real-world environments. Throughout this book, we reference their work. We encourage you check out their work because they can help you enormously as you try to figure out how to contend with your own IT energy concerns.

We spoke with two directors of The Green Grid, John Tuccillo and Roger Tipley. John Tuccillo is a Director of The Green Grid and serves as Vice

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President of Global Industry and Legislative Initiatives at American Power Conversion Corp. (APC). He's responsible for building collaborative technology and business alliances with key industry leaders as well as with policy and standards bodies. Roger is a director of The Green Grid and is an engineering strategist in HP's Enterprise Storage and Servers business unit where he has spent the last several years working on technologies to manage power consumption and improve energy efficiency. Their company loyalties on the back burner, they shared their experiences of their involvement with The Green Grid.

Carol: When and how did The Green Grid get started?

John: The Green Grid's official start was on January 16, 2007, but its founders had been working for six or eight months before then to draft bylaws, formalize the varied processes we work within, and structure the organization. With a focus on improving energy efficiency in data centers, we recognize that there are regional aspects that come into play, such as various power transmission architectures, different climates, different geographies, and different geopolitical regulations. We're working to incorporate these nuances through our expansions in EMEA (Europe, the Middle East, and Africa) and Japan.

The Green Grid formed an advisory council made up exclusively of members from the end-user community. Its objective is to stay true to the mission to improve energy efficiency for the end user. They offer feedback and contribute to validating what we're seeing.

We're always accepting new members, especially folks who want to focus on the committee work. We don't have an aggressive market program. One of the benefits of membership is that you get the fruits of our work sooner than the general public. We give everything we do away, but members get an advance view and

an opportunity to comment as they see the work in progress.

Carol: How did you get involved? Why is this important to you?

Roger: Well, it was about the time one of my customers complained that I'd just sold him a \$10 million server because he didn't have room for one more server and that one more server meant building a new data center.

As an industry, we had a problem. We had no standardization on how things were being measured. About 4 years ago, my research team could no longer fill racks. We couldn't cool them. Our growth depended on figuring out a compelling solution. We had to figure out cooling solutions, and we had to understand how to handle IT load even as more energy was needed.

John: Part of our charter is to promote, essentially giving away the work of The Green Grid. We recognized the need to create a lexicon and a series of metrics around energy efficiency so we have a common way to measure and understand what energy efficiency is and how to make improvements. The intention wasn't so much to create competition among folks measuring for PUE (power usage effectiveness) or DCiE (Data Center infrastructure Efficiency) but to create a method for self-improvement and general industry awareness. Over the last 18 months, things have started to accelerate. Giving people tools is an important first step. Although there's certainly been no shortage of entities touting their *greenness*, we've been focused on creating deliverables, which would be useful, measurable, and supported by credible science, which has been vetted across more than 200 member companies. We focused on deliverables — how to help folks identify where to start.

We spent a lot of time establishing bylaws and process. Equal parity for every member is built

into the process. Everything we publish goes through an extensive process. All our material is vetted and challenged by our membership, inclusive of our end-user community. It's all balloted. We think we're a little more nimble than traditional standards bodies. We work in an accelerated fashion. Every member has one ballot, one vote. The process resembles standards' bodies but is much quicker. We have the tools and methods to track responses. Stakeholders voice opinions. What we come out with isn't necessarily a standard, but a recommended approach. We reach out to other standards organizations and say, "Here are our efforts. Might this not be an appropriate standard of measurement?" for example. Then we're quick to refine. We have to be. We don't have five years to do what needs to be done. Our process was drafted by a broad base of the membership, and we get things finished, approved, and out. Our members have to then go out to create products that meet these recommendations and guidelines.

Roger: The Green Grid works with utilities companies, such as Pacific Gas and Electric. We work with the EPA (United States Environmental Protection Agency), with the European Union standards bodies, and with the Department of Energy. How many more power plants can we build? We have to figure out how to improve inefficiencies across this ecosystem of entities.

Our first order of business is around measurement. You can't improve what you don't measure. We give organizations a way to measure efficiency and waste, which lets them figure out where to focus and where not to focus. The cornerstone is communicating performance so that each stakeholder can understand where and how to measure and then how to translate that measurement into something meaningful. It needs to be meaningful to the Chief Financial Officer (CFO). It needs to be relevant to the folks

managing IT and to the folks architecting IT solutions. It's important to the folks responsible for facilities. We're trying to talk to all these constituencies and make it easy to understand. Making things simple is hard though. Knowing your utility bill is a great first step. How many folks know the utility bill for the data center?

John: We're seeing an important organizational shift. When facilities and IT begin collaboratively working together, IT understands completely its impact on facilities.

IT needs to involve the business process owner. The CFO needs to articulate the business requirements. Both facilities and IT need to know these business requirements and the business plans, including things like acquisitions that have a big impact on both facilities and IT. The organizations benefit greatly if facilities and IT plan collaboratively. IT needs to break down its silos. Too often storage is its own silo, servers another, networks yet another, and all separate from facilities. Organizations need more global management tools to roll up the disparate parts and see what needs to improve and where to virtualize.

Roger: John and I talk a lot about what improvements can be made by changing behavior, breaking down silos, and communicating. Billing models, for example, can be a big deal. If the data center is billed by the rack, that will drive a behavior that drives up density. Too many trends in computing are driven by bad metrics.

Folks can't make good decisions based on small sample sizes. You need a year's worth of data, compiled and generalized. Every day is dynamic. You need to look toward the future. Does what you're doing with storage and power go down with demand and scale up? You want scalable power, even more dynamic — over the day, week, season — a very dynamic load. The infrastructure needs to be dynamic as well.

