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# Creating The Green IT Action Plan

by Christopher Mines  
for CIOs



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## Creating The Green IT Action Plan

CIOs Should Plan Comprehensively And Act Incrementally

by **Christopher Mines**

with Eric G. Brown and Christina Lee

### EXECUTIVE SUMMARY

Enterprise CIOs have a variety of motivations for improving the environmental footprint of their IT operations, but they are often unsure how to proceed. IT organizations should start by crafting an action plan for implementing green IT principles.

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Forrester interviewed IT suppliers and user organizations including: Betfair, Citigroup, Dell, Deloitte, Green Grid, EMC, Hewlett-Packard (HP), IBM, Intel, McDonald's, PG&E, Schwab, and Sun Microsystems.

#### Related Research Documents

["What Data Center Crisis?"](#)

September 20, 2007

["Tapping Buyers' Growing Interest In Green IT"](#)

May 10, 2007

["The Greening Of IT"](#)

April 19, 2007

## YOUR COMPANY IS GOING GREEN

Consider a few examples of recent corporate-level green initiatives:

- **GE kicks off an ambitious green agenda.** The giant conglomerate will double its eco-related R&D spending to \$1.5 billion in 2010 and aims to double its revenues from sales of clean-tech products and services to \$20 billion. Simultaneously, it pledged to reduce greenhouse gas (GHG) emissions by 1% by 2012, instead of the 40% increase in GHG that a business-as-usual trajectory would reach.
- **Toyota sets broad environmental goals in its five-year plan.** The world's largest auto company unveiled its Second Consolidated Five-Year Environmental Action Plan (2007-2011), setting new environmental goals for all phases of the vehicle life cycle and addressing themes of energy, climate change, recycling, resource conservation, use of toxic substances, atmospheric quality, and environmental management.
- **Citigroup plans to invest \$50 billion in carbon-reduction projects.** Over the next 10 years, the world's largest financial services company will devote \$50 billion in investments and financing to projects that reduce global carbon emissions. Citigroup will focus its investments on the commercialization and development of alternative energy and clean technology both within its own operations and among its clients.
- **Wal-Mart steps up its sustainability commitments.** The CEO of the Fortune No. 1 retailer announced "Sustainability 360," a program to broaden the company's green efforts beyond its own operations to those of its suppliers, employees, communities, and customers.

### IT Must Be A Contributor

What do such initiatives have to do with corporate IT organizations? Everything. IT will be a significant part of corporations' efforts to make their internal operations greener, given its disproportionate share of energy consumption relative to headcount or overall operating costs.<sup>1</sup> As a leader of an IT organization, if you haven't gotten the knock on your door yet from someone asking how and when IT will contribute, you will.

The green IT mandate generally comes from one or more of three motivations:

- **Improve business results.** Making IT more efficient is simply good business. Green IT can save hard dollars through reduced (or at least slower-growing) energy expenditures.
- **Enhance customer and public perception.** A greener company, with greener products and services, is more desirable to a growing segment of consumers and business customers. Improving green practices can also reduce the risk of a "gotcha" event caused by intervention by government regulators or NGO watchdogs.

- **Do the right thing.** Some companies are led by “true believers” who simply want to do the right thing for the environment.

Whatever the sources of a green IT mandate, it’s moving higher on the priority list for IT organizations.<sup>2</sup> Rather than turning into another thorny project dumped in IT’s lap by “the business,” green IT is a sterling opportunity for the IT organization to be a role model for other functional groups in the company. By greening its own operations and serving as an enabler for a broader set of green business opportunities, IT can accelerate its own transformation from a service organization into a full participant in business strategy and contributor to business results.<sup>3</sup>

Now is the time for CIOs to get their green IT initiatives started.

### Start By Creating An Action Plan

How do you get started? Create a plan. The purpose of this research report is to guide CIOs and senior IT managers in crafting an action plan for getting green IT under way. Such a plan is the necessary first step because it:

- **Defines purpose.** Planning efforts need focus and boundaries. The green IT action plan should ask and answer a fundamental question: “What are we trying to accomplish?”
- **Sets expectations.** The plan will help stakeholders throughout the company understand what’s possible and when.
- **Builds credibility.** You may be asking for significant capital outlays, in some cases with returns not directly evident in IT’s operations. Senior management will be looking for prudent expense governance and alignment with corporate priorities. The action plan is the place to put IT’s spending and projects into a broader business context.<sup>4</sup>
- **Establishes priorities and tradeoffs.** The green IT plan makes choices about what gets done sooner, later, or not at all. And it can lay out tradeoffs between goals that might be in conflict.

## FOUR STEPS TO CREATING THE GREEN IT ACTION PLAN

Before putting pen to paper, IT leaders should take several steps to ensure the plan’s impact and success.

### 1. Identify And Prioritize The Goals Of A Green IT Initiative

The different sources and motivations for pursuing green IT mean that organizations will have different goals for their initiatives. In turn, different goals will lead to different priorities and decisions about which activities to pursue most intensively. Each company will have different goals,

depending on its industry and business context, management style and preferences, and particular IT infrastructure and architectures.

Based on our interviews with IT practitioners and a growing volume of client inquiries, the menu of green IT goals for most companies will include:

- **Reduce overall electricity consumption and spend.** Cutting the firm's electricity bill is usually the most tangible and easiest-to-calculate green IT goal. Many of the optimization and architectural improvements recommended below will reduce usage and spending on electricity, either on an absolute basis (usage is lower in the future than the present) or a relative basis (usage is lower in the future versus a "do-nothing" trend line projected from current levels).
- **Improve utilization of IT equipment.** This is a related measure of IT efficiency, aimed at reducing not only electric power usage and spending but also future capital outlays on IT servers, storage, and other gear. Higher utilization means managing the same IT workload on fewer servers, which in turn means less need for power, cooling, and space — and fewer new servers to buy going forward.
- **Contribute to corporate social responsibility (CSR) and green initiatives.** In turn, these corporate efforts typically have goals like: 1) increase workforce productivity and satisfaction; 2) improve talent attraction and retention; 3) improve brand equity through more favorable customer and public perception; and 4) lower the risk of regulatory noncompliance or NGO scrutiny.<sup>5</sup>
- **Capture tax and utility rate benefits of green initiatives.** Numerous US states offer property tax exemptions or corporate income tax incentives for green efforts like improving energy efficiency or tapping renewable energy sources. And a growing number of utilities, led by PG&E in northern California, are offering rebates to customers that implement energy-efficient technologies like virtualization in their IT shops.

## 2. Assess The Current Situation Relative To High-Priority Goals

Assessment is a crucial step in green IT planning, but it's often overlooked, especially by vendors looking to sell new, more energy-efficient gear. IT organizations cannot plunge into a technology or architecture refresh without first:

- **Cataloging existing internal activities.** Several companies we've interviewed were amazed at the breadth of ad hoc activities already under way when they started a formal green IT effort. Initiatives by individual departments or locations can be fuel for a more coordinated effort. Find them, understand their goals and motivations, and bring them into the fold without draining the spirit that got them going in the first place.

- **Assessing baseline electricity usage by IT gear.** Here's where IT and facilities need to team up. In some cases, we have found very advanced planning and instrumentation of electricity usage throughout an organization; but in most cases, there is remarkably little communication or collaboration between these two organizations.<sup>6</sup> Companies should include all IT assets, both in and beyond the data center.

For the data center(s), companies should measure the ratio of total power into the data center against power that gets to the computing systems (the rest goes for auxiliary equipment including power distribution, lighting, cooling, and the like). The Green Grid consortium defines this power usage effectiveness (PUE) ratio as:

$$PUE = \text{total facility power} / \text{IT equipment power}$$

In practice, the Green Grid estimates that data center PUEs range from a good rating of 1.3 (77% of the total power supplied to the data center is used to power data processing equipment) to a poor ratio of 3.0 (33% of total power actually reaches the IT equipment).<sup>7</sup> IBM estimates that its customers' data centers range from 1.5 to 3.5 PUE.<sup>8</sup>

- **Specifying IT's organizational role.** A green IT initiative must be placed in a broader organizational context. A crucial part of that is identifying the leadership and execution role of IT relative to facilities, HR, legal, and marketing. Green IT must also be explicitly aligned with CSR and other green initiatives including regulatory compliance and reporting. And green IT efforts must fit with the technology organization's anticipated budget and capacity trajectory as dictated by the growth-of-business requirements.
- **Documenting current procurement criteria and supplier qualification processes.** A critical section of the green IT action plan will be changing procurement criteria and processes to favor green products and greener suppliers. This activity starts with a clear documentation of current procurement practices.
- **Tapping the nascent "eco-services" suppliers.** The large systems OEMs and some of the IT services firms have started service teams aimed specifically at performing assessments and helping calculate ROI of green IT initiatives. For example, BT has taken its leading internal sustainability practices and created a carbon impact assessment service to help other businesses reduce their energy consumption and environmental footprint.<sup>9</sup>
- **Understanding potential barriers and inhibitors to green IT.** The ride won't be a smooth one. Anticipate as many objections, risks, and barriers as possible before setting out. These may be technology or capital risks (e.g., systems migration that affects traditional IT metrics) but will just as likely be behavioral or procedural inertia that will inhibit the adoption of green policies and practices.

### 3. Find And Execute Quick Wins

After assessment, again the temptation will be to plan for big-bang infrastructure and process changes. Resist this. It is vital in the early stages to demonstrate successes; the best way is to start small. Pick a handful of easy-to-understand and easy-to-see activities and make sure everyone knows about them. The goals at this point are to: 1) get employees interested and excited, and 2) build credibility with management. These quick-win activities can be done in parallel with, and incorporated into, writing the longer-term action plan.

In addition to very obvious actions like changing to efficient light bulbs, printing double-sided, and recycling consumables, choose from a menu of quick-win activities like:

- **Find and turn off unused IT equipment.** Most organizations have servers, printers, disk storage, and the like that are completely unused but still humming away.
- **Turn off lights, PCs, and other equipment.** Employees need reminding, cajoling, and even rewards to flick off the lights and power down their desktops when they leave the office for the night. One company we interviewed prominently posts signs that say “Turn IT off!”
- **Enable power management on printers and other peripherals.** In many organizations, power-save features are installed but not enabled. This should be easy to fix by reading the manuals.
- **Join Climate Savers.** Among other things, this will require an organizational commitment to buy only PCs and servers that comply with the Energy Star 4.0 standard, which currently means paying about a \$20 price premium on a desktop PC.<sup>10</sup>
- **Improve data center airflow.** Without any new equipment or procedures, the IT team can improve circulation in the data center by moving boxes, unblocking air vents, and generally tidying up. This can quickly translate into a lower power draw for the CRAC and related air-handling equipment.

### 4. Craft And Communicate An Action Plan

The action plan document is the touchstone of your green IT initiative. Use it as a way to foster creativity, focus on activities with the most impact, and communicate your intentions and progress to the rest of the company. The plan should incorporate a variety of internal marketing techniques both in the document and in surrounding activities:<sup>11</sup>

- **Promote and certify green ideas and activities.** Encourage employee participation by creating a “green IT certification” for programs or initiatives. Develop an icon that employees can use in their internal collateral and slide presentations.

- **Create platforms for employee brainstorming.** Foster employee buy-in and get new ideas by formalizing brainstorming sessions, complete with management participation and recognition. Challenge employees to respond to current and prospective issues with creative ideas.
- **Emphasize internal viral marketing.** Employees have to own the problems and be part of the solutions. The role of IT management is to inspire and support local initiatives. Identify and reward champions in local geographies and across business units.
- **Employ change management techniques.** Organizational transformation is never easy since it involves simultaneous people, process, and cultural change. While there is no guarantee of success, CIOs who follow a disciplined approach and use standard transformation tools can significantly improve the likelihood of a favorable outcome.<sup>12</sup>

#### FOUR CRITICAL SECTIONS OF THE GREEN IT ACTION PLAN

An executive summary should capture the purpose of the plan, identify its key audience(s), and summarize the major issues and action plan elements. After that, the action plan should include four critical sections:

- Revising processes and metrics
- Optimizing efficiency of existing IT assets
- Revamping architecture and infrastructure
- Positioning IT to enable green business practices

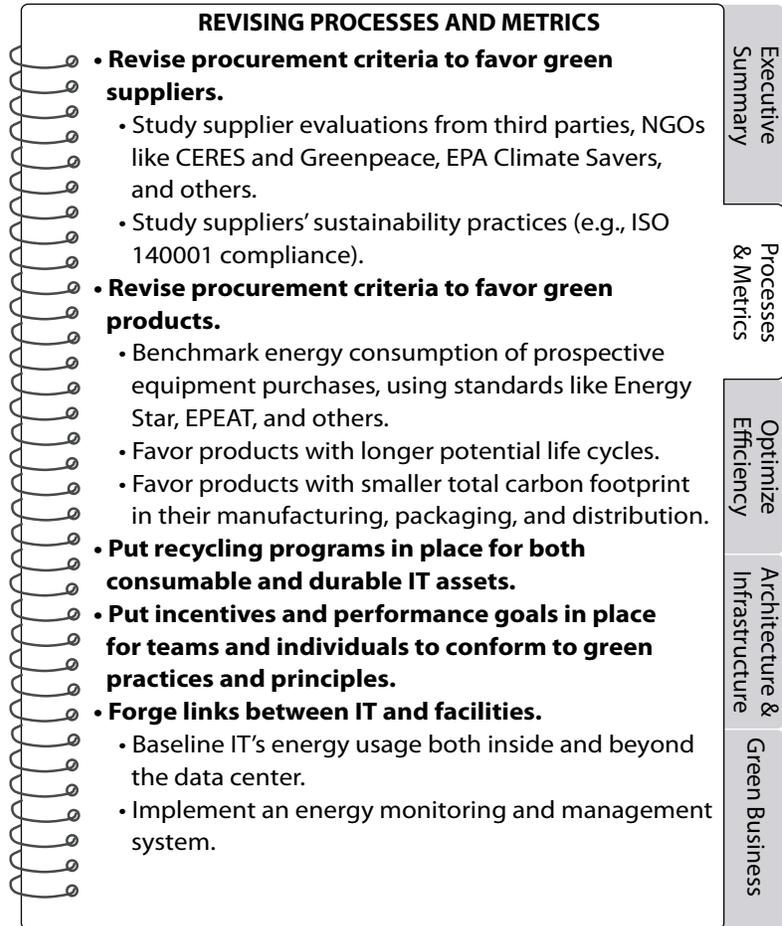
#### Revising Processes And Metrics

Changing organizational processes and measurements is a subtle but vital part of any transformation effort. Changes in processes and metrics will drive changes in behavior, which in turn will underpin all the other technology or architecture changes that a company makes. By focusing on processes and metrics first, your company can ensure that green does not become a “bolt-on” to the business, but rather is integrated into employees’ work.

Process changes will extend beyond the IT organization; in fact, one of the principal goals of these activities is to foster closer collaboration among IT leadership, sourcing and vendor management, and facilities or real-estate functions (see Figure 1). Important considerations for changing processes and metrics include:

**Figure 1** Revising Processes And Metrics

 A spreadsheet with additional data is available online.



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Source: Forrester Research, Inc.

- **Being explicit about what’s expected.** Green criteria can be built into existing performance management systems, balanced scorecards, and the like that teams are already using to measure, incent, and reward performance. Revise the employee competency or maturity model to include sustainability competencies and skills, so people can see how they rate and what they need to do to move to the next level.
- **Giving teams and individuals time to adapt.** A crucial success factor when changing goals and metrics is to allow people time to adapt to new standards. Give affected organizations plenty of runway time between setting a new policy or goal and enforcing it.

- **Putting a cross-functional team in charge of IT power management.** This is the crucial bridge between IT and facilities that will, among other things, make sure that IT sees the *real* cost of electrical power used by data centers and other computing assets. Many organizations rely on allocated cost (e.g., per square foot) that may understate the actual costs by a factor of 10 or more. Once the real costs are determined, change metrics to incent and reward IT to flatten and then reduce the electricity bill.
- **Deciding how rigorously to enforce procurement criteria.** Companies have different levels of rigor in their green procurement criteria. For some, green criteria like recyclability or energy efficiency are tiebreakers between products or companies that are very close on other criteria. For others, green product characteristics are dealbreakers that will disqualify products or companies that don't hit all of them. Decide where on this spectrum your company will fall.

Make sure that IT buyers do not get caught in the crossfire between long-standing commercial objectives and newer green policies. Integrating CSR and procurement people in a single organizational structure, and combining environmental and commercial purchasing criteria in the purchasing process can help defuse the tension between, for example, desires for the best price-performance and the longest life-cycle IT equipment.<sup>13</sup>

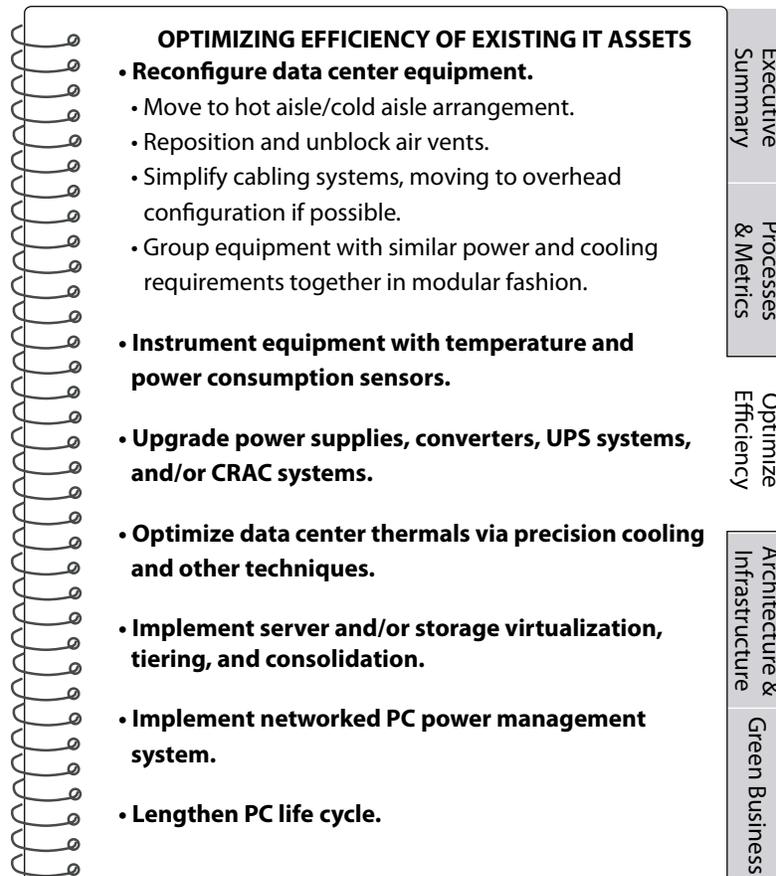
- **Using eco-labels carefully.** The environmental guarantee of an eco-label may provide a quick win for a firm looking to move ahead on its green agenda. But handle with care. Typically the labels focus on one dimension like energy efficiency; unrecognized cost avoidance opportunities continue to obscure the true value of sourcing eco-labeled products. Over time, link procurement criteria to an overall environmental management system that creates a standard framework of criteria across geographies.<sup>14</sup>
- **Training IT and users in new practices and processes.** New metrics, procedures, and policies will require training to become everyday work habits. And if new architectures or system infrastructure are part of your green IT program, user training will be a vital component. Employees across the organization will see big changes after a move to thin-client systems, for example, while IT operations personnel will need new processes for running virtual server or storage application environments.

### Optimizing Efficiency Of Existing IT Assets

Every IT organization will choose different optimization priorities depending on its green IT goals, appetite for change, and current infrastructure (see Figure 2). But even with wide variation in priorities, IT shops should always:

**Figure 2** Optimizing Efficiency Of Existing IT Assets

 A spreadsheet with additional data is available online.

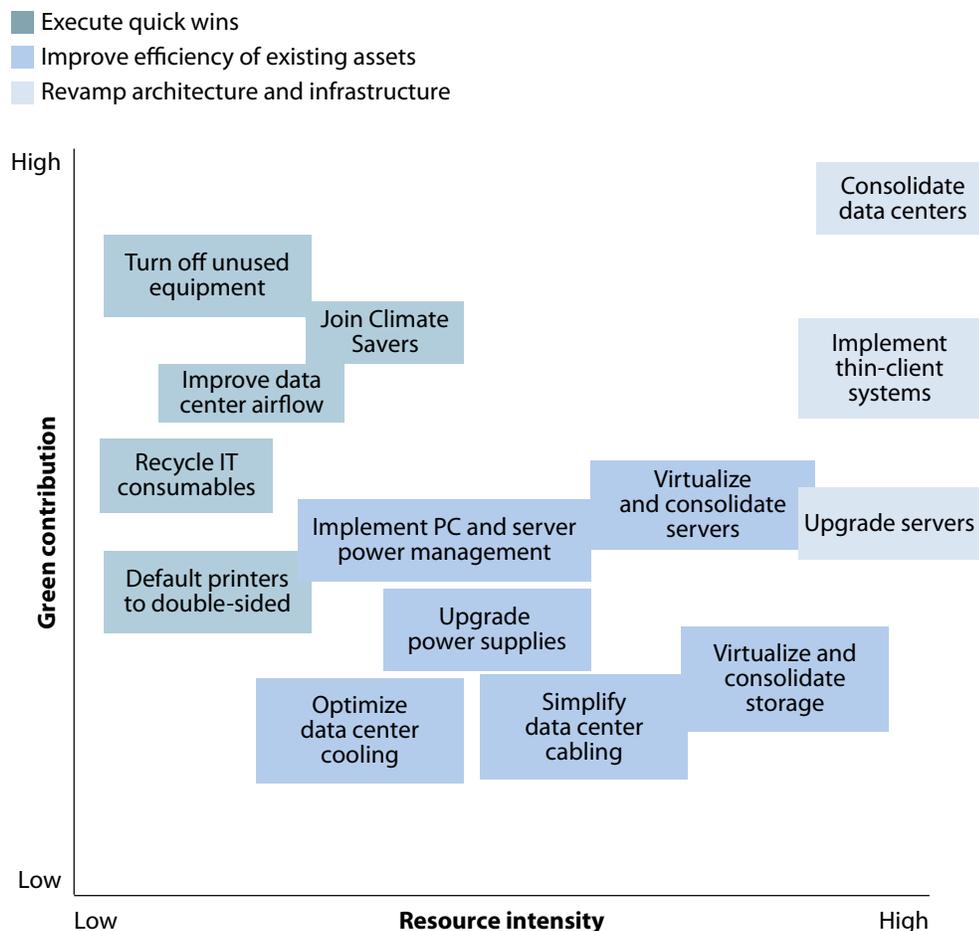


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Source: Forrester Research, Inc.

- **Gauge your appetite for change.** We offer general guidelines in terms of choosing efficiency and infrastructure initiatives (see Figure 3). For each activity, estimate the degree of progress it will generate toward your organization's green IT goals, and estimate the cost, complexity, and time frame required to implement the change.
- **Right-size infrastructure to meet current and anticipated requirements.** For some, this will be a break with the one-size-fits-all approach that is typical of facilities-led data center design. Our interviews reveal that companies tend to over-engineer space, cooling, and power capacity, "just in case." The data center team, and resulting IT-facilities communication and collaboration, is the starting point for activities like equipment reconfiguration and thermal optimization.

**Figure 3** Mapping The Cost-Benefit Of Green IT Activities



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Source: Forrester Research, Inc.

- **Demonstrate the possibilities with simple arithmetic.** One simple example of cost savings via a power management system would be to turn off servers on a schedule that matches your utility's peak and off-peak hours. For example, power the servers in a development environment for 70 hours per week instead of leaving them on the full 168 hours. The arithmetic is:

$$\text{Unmanaged electricity cost per server} = (70 \text{ hours} * \text{peak electric rate} * \text{max server draw}) + (98 \text{ off-peak hours} * \text{off-peak electric rate} * \text{idle server draw})$$

$$\text{Managed electricity cost per server} = (70 \text{ hours} * \text{peak electric rate} * \text{max server draw}) + 0$$

Assuming electricity prices of \$0.14/kWh at peak and \$0.11/kWh off-peak, and 0.5 kWh maximum server draw and 0.25 kWh idle server draw, implementing power management

that turned off the servers in off-peak hours would save \$2.695 per server per week, or a 35% reduction versus the unmanaged scenario.

- **Use vendor comparisons to judge products' green capabilities.** Identify system features that can help your green activities and spotlight them in product comparisons. For example, power management for networked PCs is one of dozens of features in client management systems (CMS) software. In our recent Forrester Wave™ evaluation of CMS suites, only LAN Desk and Symantec (Altiris) received the top scores (5.0) for their wake-on-LAN power management capability. Other prominent vendors — HP, IBM, CA, Novell — scored a 2.0; and Microsoft's product scored a 0.0.<sup>15</sup>

### Revamping Architecture And Infrastructure

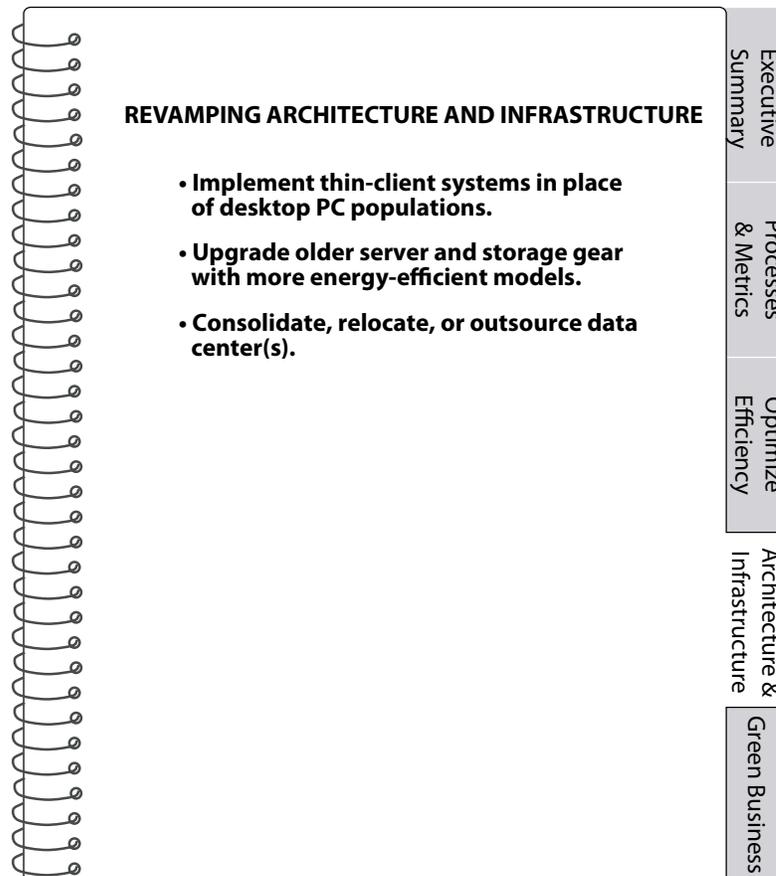
Revising processes and optimizing assets will yield significant green and cost benefits for most companies. Some will have the opportunity to go further and delve into revamping their IT infrastructure and architectures (see Figure 4). Often such infrastructure revamps are catalyzed outside of IT per se, for example by real-estate consolidation, mergers, divestitures, or other corporate actions.

These activities will for most companies have the biggest payoffs in both economic and environmental terms, but they must be approached with caution since they are generally:

- **Capital-intensive.** Architectural revamps often involve tackling complex and largely unplanned data center and IT architectures that result from acquisitions, systems evolution, operational crises, and shadow assets brought in without the IT organization's knowledge or blessing. It is vital for IT and facilities to approach the financial planning of infrastructure revamping in concert, since capital spending by one functional unit (IT) will often accrue to the operational cost benefit of another unit (facilities). Both organizations must be ready to present a holistic picture of financial cost/benefit to senior management.
- **High risk.** Financial and environmental gains notwithstanding, the operational risks of infrastructure changes often slow or prevent their implementation. Revamping may jeopardize traditional IT metrics like application availability and throughput. The green IT action plan must document mitigation of risks like systems migration, user training, and system backup.
- **Long term.** For most IT organizations, new data centers or new client system architectures are once-in-a-decade undertakings, with lengthy planning and implementation cycles. These cycles may be accelerated by corporate events or particular IT circumstances like lack of space or power for data center expansion. Green considerations may also speed up the planning and implementation of architectural refresh by adding green benefits that tip the scales toward earlier or more complete revamping. We expect that green IT will give a boost to long-running IT architecture changes like thin-client systems and data center outsourcing.

**Figure 4** Revamping Architecture and Infrastructure

 A spreadsheet with additional data is available online.



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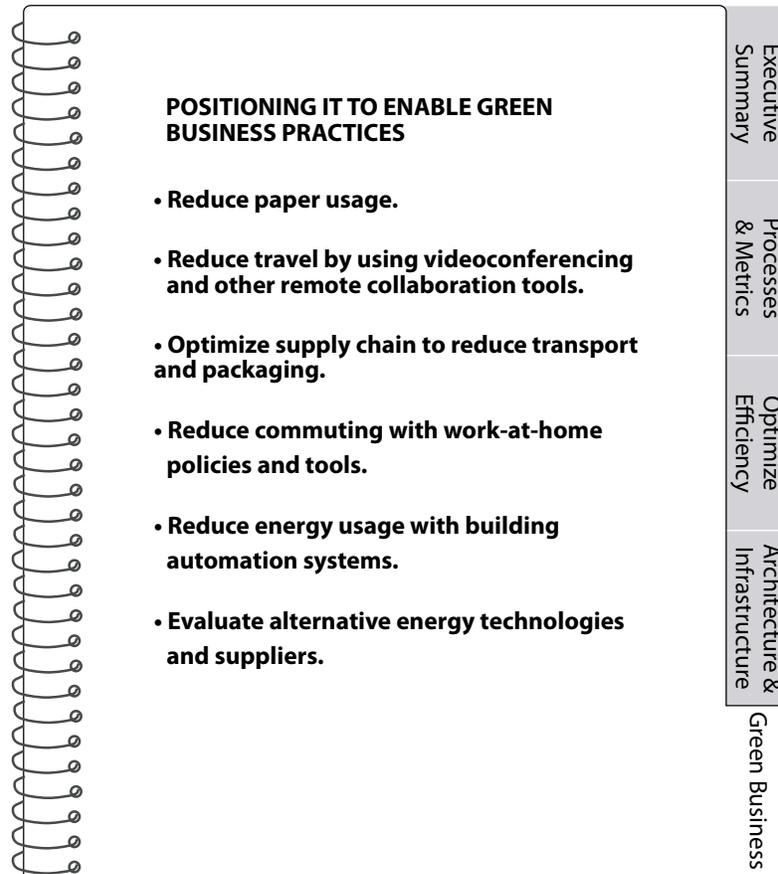
Source: Forrester Research, Inc.

### Positioning IT To Enable Green Business Practices

In this section, the green IT action plan will look beyond the IT organization and assets, to address how IT can be an enabler for green business practices throughout the firm. In concert with other initiatives like the marketing of IT and the transformation of IT into BT (business technology), enabling green business practices helps improve IT's ability to be an initiator of business innovation. By championing green business initiatives, IT can be a role model for other functional organizations, including HR, supply chain, customer service, and finance (see Figure 5).<sup>16</sup>

**Figure 5** Positioning IT To Enable Green Business Practices

 A spreadsheet with additional data is available online.



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Source: Forrester Research, Inc.

WHAT IT MEANS

THE NEXT FRONTIERS FOR GREEN IT

While the menus of green IT activities suggested in this report can occupy months of planning and years of execution for CIOs and their organizations, we can see the next frontiers on the horizon. Very few IT suppliers and customers are thinking about these yet, but you should at least keep them in the back of your mind:

- **Measuring the lifetime carbon footprint of IT assets.** IT is starting to think vigorously about energy efficiency, but the energy used during a server’s operating lifetime is only part of its total environmental impact. In fact, systems OEMs agree that most of the energy consumed by IT equipment occurs during its manufacture. We expect manufacturers to work on quantifying the total lifetime impact (or carbon output) of their equipment, including raw materials, manufacturing, transport, packaging, and recycling. This kind of analysis will go well beyond the energy standards being put in place today.
- **Reusing and recycling.** Systems vendors tell us that very few customers are thinking hard about the end-of-life disposition of IT assets. The lifetime impact analysis described above will factor into organizations’ decisions about the frequency of equipment refresh, upgrades, and how to “hand down” equipment to other institutions. We believe that manufacturers are on the cusp of forming a new design ethos for IT gear that will emphasize longer life cycles and easy upgrading, instead of the fast product cycles and ever-shorter refresh cycles that most vendors depend on today.

SUPPLEMENTAL MATERIAL

Companies Interviewed For This Document

|                      |                  |
|----------------------|------------------|
| Betfair              | IBM              |
| Citigroup            | Intel            |
| Dell                 | McDonald’s       |
| Deloitte             | PG&E             |
| EMC                  | Schwab           |
| The Green Grid       | Sun Microsystems |
| Hewlett-Packard (HP) |                  |

## ENDNOTES

- <sup>1</sup> The numbers vary widely by industry and geography, but a rule of thumb is that IT accounts for 3% of overall operating costs and the same percentage of headcount within enterprise-class companies. And while estimates of IT's energy consumption are notoriously difficult to come by, server equipment *alone* draws an estimated 2% of overall electricity use, and by adding PCs, storage, and related cooling and ventilation gear, it's easy to get to IT representing 8% to 10% of overall electricity consumption in most large companies.
- <sup>2</sup> For a summary of the state of corporate awareness and activity in making IT operations more environmentally responsible, see the May 10, 2007, "[Tapping Buyers' Growing Interest In Green IT](#)" report.
- <sup>3</sup> For more details on IT organizations' transformation to business technology (BT), see the October 25, 2006, "[IT Execs Boost Focus On Business In 2007](#)" report.
- <sup>4</sup> For more details on crafting an overall plan for IT in the context of business objectives, see the June 8, 2006, "[Creating The Strategic Plan For Today's IT](#)" report.
- <sup>5</sup> For details on the role of corporate governance, risk, and compliance (GRC) staff in prioritizing green initiatives with a firm's overall CSR efforts, see the May 11, 2007, "[GRC Should Take The Lead In Green Business](#)" report.
- <sup>6</sup> We took an interesting tour recently of another company's very advanced green building in our neighborhood in Cambridge, Mass. The company's facilities team and the building automation vendor led the tour, and when we asked about IT's participation in the company's green efforts, there was some mumbling that indicated that IT and facilities were not particularly in tune with each other. In our travels and client inquiries, this is the dominant scenario.
- <sup>7</sup> For more details on the PUE ratio, see "Green Grid Metrics: Describing Data Center Power Efficiency," published by the Green Grid, January 2007 ([www.greengrid.org](http://www.greengrid.org)). This paper draws on "Best Practices for Data Centers: Lessons from Benchmarking 22 Data Centers," in *2006 ACEEE Summer Study On Energy Efficiency In Buildings*, which in turn summarizes work by the Lawrence Berkeley National Laboratories.
- <sup>8</sup> Source: "Project Big Green," IBM press release, May 10, 2007 (<http://www.03.ibm.com/press/us/en/pressrelease/21524.wss>).
- <sup>9</sup> For a profile of BT's internal sustainability efforts, see the July 23, 2007, "[BT's Green Strategy Unfolds](#)" report. For more information, see BT's sustainability site ([www.biggerthinking.com/en/sustainability](http://www.biggerthinking.com/en/sustainability)).
- <sup>10</sup> See [www.climatesaverscomputing.org](http://www.climatesaverscomputing.org) for more details.
- <sup>11</sup> For more ideas about spreading the good word about IT's initiatives, see the August 23, 2005, "[The Marketing of IT](#)" report.
- <sup>12</sup> For more details on implementing a balanced scorecard to drive organizational change, see the April 30, 2007, "[Transforming IT With Strategic Measurement](#)" report.
- <sup>13</sup> See "Beyond Monitoring: A New Vision for Sustainable Supply Chains" by Business for Social Responsibility for more discussion of integrating internal resources ([www.bsr.org](http://www.bsr.org)).

- <sup>14</sup> For more details on the strengths and weaknesses of various eco-labeling schemes in the US and Europe, see the June 12, 2007, “[Using Eco-Labels To Support Green IT](#)” report.
- <sup>15</sup> For more details on the Forrester Wave methodology and a spreadsheet detailing the features and reviews of eight vendors’ client management suites, see the July 24, 2007, “[The Forrester Wave™: Client Management Suites, Q3 2007](#)” report.
- <sup>16</sup> For more details on how companies are incorporating sustainability principles into their supply chain operations, see the August 3, 2007, “[Best Practices: Successfully Managing Security And Risk In A Global Supply Chain](#)” report.

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