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Q&A: The Economics Of Green IT

What Are The Financial Benefits Of Green IT?

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EXECUTIVE SUMMARY

Don't be fooled: Green IT is as much about the greenbacks as it is about reducing the environmental impact of operating IT and the business. In fact, financial motivation — not environmental motivation — is the driving force behind the pursuit of greener IT. So when asking yourself whether green IT has financial merits, the short answer is yes — but IT leadership must understand why and how this is achieved to invest time and capital wisely.

QUESTIONS

1. Does financial value or environmental value drive green IT projects?
2. Do green IT projects cost more than non-green projects?
3. How can green IT projects reduce IT operating and capital expenses?
4. How can green IT return funds to the IT organization?
5. What is green IT's role in reducing broader business spending?
6. What financial inducements are available for green IT investments?
7. How should I prioritize green IT investments?
8. Should IT leadership care who benefits from green IT projects?

DOES GREEN HAVE A PLACE IN THE COST-CONSCIOUS WORLD OF IT?

IT is constantly challenged to reduce cost and do more with less. So within the cost-conscious world of IT, should IT leadership even consider green IT? Yes. In addition to reducing the capital and operating expenses of IT immediately and into the future, green IT can also deliver financial value across the broader business. And while some green IT projects require an upfront capital investment that may cost more than non-green alternatives — for example, purchasing more energy-efficient IT assets, or rolling out video conferencing — other initiatives like PC power management and duplex printing can come at no cost at all aside from your time. Coupled with government or utility-sponsored incentive programs to encourage more eco-friendly behaviors, green IT projects can become even more financially attractive. The following questions and answers will help IT executives understand the financial value that green IT can deliver.

1. Does financial value or environmental value drive green IT projects?

Forrester's most recent Green IT Online Survey shows that the primary motivation for organizations to pursue green IT is financial, not environmental.[1] Google is a great example of this. Like any other corporation, Google exists to maximize financial returns to its shareholders — and this economic imperative is the cornerstone of its green IT strategy: "Sustainability is good for the environment, but it makes good business sense too. . . . It is this economic advantage that makes our efforts truly sustainable."[2] However, environmental motivations — and their value — should not be discounted, especially if you're in an organization with a culture of corporate social responsibility (CSR) and sustainability. In fact, the second most popular driver for green IT is to "do the right thing for the environment."

2. Do green IT projects cost more than non-green projects?

Yes and no. Some green IT projects may require an upfront capital investment that costs more than a non-green alternative, but the total cost of ownership over time may be less due to reduced ongoing operating expenses. Let's not forget there are also a host of green IT projects that don't require any upfront investment beyond your time. In many cases, this means turning on features that are already available to you or powering down idle but energy-consuming assets such as:

- **Green IT projects that cost more upfront but ultimately cost less over time.** Leadership in Energy and Environment Design (LEED) certifying your new data center may add a 3% to 4% upfront premium, but your facility is likely to be 20% to 30% more energy-efficient ongoing. Barclays Bank directed capital investment toward Hewlett-Packard's Dynamic Smart Cooling system, which is expected to reduce ongoing data center energy consumption by 13.4% per year.

- **Investment in staff time with immediate cost savings**. General Electric, for example, expects to save $2.3 million per year across its PC environment by simply turning on the power management features already available in Windows, such as standby and hibernate.[3] And Citigroup expects to save $860,000 per year by enabling duplex copier and printer settings.[4]

3. How can green IT projects reduce IT operating and capital expenses?

Depending on your goal, applying green IT technologies and best practices can effectively reduce IT operating expenses (OPEX), capital expenses (CAPEX), or both (see Figure 1). From an OPEX perspective, green IT can reduce ongoing expenses such as power costs, data center cooling costs, hardware license fees, and even staffing costs. In the realm of CAPEX, green IT can defer or eliminate new capital investments by increasing asset utilization, extending an asset's useful life, and increasing data center space, power and cooling, and capacity. However, it's important to realize that:

- **While CAPEX and OPEX strategies can go hand-in-hand . . .** Server virtualization is a prime example of a greening initiative that yields both CAPEX and OPEX benefits simultaneously. To reduce CAPEX, virtualization reduces the need for future investments in physical servers. In

turn, your organization can benefit from: 1) lower data center energy and cooling costs as fewer physical servers are in use; 2) reduced hardware license fees over time as physical servers are replaced with virtual substitutes; and 3) even reduced or reallocated staffing costs by managing a less hardware-intensive environment. To close the loop, reduced power and cooling demands will extend the life of your data center — a major capital expense you should defer as long as possible. As an example, Solvay Pharmaceuticals' 100 virtual machines have translated into hardware savings (CAPEX) of $1.5 million and annual power and cooling (OPEX) savings of $67,000.[5]

- **. . . they are sometimes at odds.** Extending the refresh cycles of assets can help reduce electronic waste (e-waste) while deferring CAPEX investments — but it comes at the price of improved energy efficiency. While purchasing more energy-efficient assets or migrating to a more energy-efficient architecture — such as thin clients — can effectively reduce energy-related costs and CO_2 emissions, a premium capital investment is necessary. To overcome the CAPEX versus OPEX dilemma, recognize that operating expenses are likely the largest drain on your IT budget and innovation capacity — with 70% to 80% going to what Forrester calls IT MOOSE (spending to maintain ongoing operations, systems, and equipment). With that in mind, focusing on projects to free up IT MOOSE can offer short-term and long-term benefits — but it might require you to spend money (CAPEX) to save money (OPEX).[6]

In the realm of green IT, Forrester recommends that IT leadership first apply best practices to capitalize on minimal or zero capital investment activities such as PC power management, hot-aisle/cold-aisle architecture in the data center, and retiring applications and related infrastructure that are severely underutilized. From there, consider the larger-scale capital investments — such as a thin-client architecture, server virtualization, or data center site consolidation — that offer significant economic and environmental savings over time. As HP's CEO Mark Hurd explains, ". . . you have to have the courage to go to the investment base and tell them, 'I am going to raise CAPEX with a strategic objective to lower sustained operating expense over time.'"[7]

4. How can green IT return funds to the IT organization?

Beyond cost savings, IT leaders can return funds to their organization by reselling their end-of-life IT assets. IT asset reclamation and disposal service providers — from manufacturers such as Dell, HP, and IBM or pure-plays such as Intechra and Redemtech — can streamline this for you. Not only will they securely and safely dispose of your end-of-life IT gear, but they will also resell these assets into the secondary market. And depending on the volumes and types of your assets being resold, the return can be sizeable. For example, healthcare giant WellPoint, Inc. received $49,000 in the first quarter of 2008 alone by leveraging its relationship with Intechra to resell its end-of-life IT assets into the secondary market.

Figure 1 Green IT Initiatives Have Varying Effects On OPEX And CAPEX

	OPEX: *Decrease ongoing costs by reducing . . .*				CAPEX: *Avoid purchasing new by increasing . . .*				
	Power costs	**Data center cooling costs**	**Hardware license fees**	**Staffing costs**	**Asset utilization**	**Asset's useful life**	**Data center space**	**Data center power capacity**	**Data center cooling capacity**
Energy conservation tactics									
PC power management	✓								
Server power management	✓	✓						✓	✓
Energy efficiency tactics									
Energy efficient PC sourcing	✓								
Energy efficient server sourcing	✓	✓						✓	✓
Thin client deployment	✓			✓		✓			
Data center hot/cold-aisle architecture	✓	✓			✓	✓		✓	✓
Consolidation tactics									
Decommission "dead" servers	✓	✓	✓	✓			✓	✓	✓
Consolidate and virtualize servers	✓	✓	✓	✓	✓	✓	✓	✓	✓

47548 Source: Forrester Research, Inc.

5. What is green IT's role in reducing broader business spending?

Information technology can be a critical enabler to what Forrester calls the "green enterprise" — an organization that actively reduces its environmental impact across its value chain activities to mitigate risk, reduce costs, and increase revenues to ultimately deliver shareholder value. While the greening of IT is effective at reducing IT-associated costs, the positive environmental and financial benefits of using IT as an enabler of the green enterprise can be much more profound.[8] International retail giant Tesco is a great example of this. IT's contribution to the company's total carbon footprint is only 4% — but Tesco believes that IT has the enabling potential to reduce Tesco's total carbon footprint by 20%, which in turn has significant financial benefits like a 20% reduction in electricity costs and a 17% reduction in fuel costs.[9]

6. What financial inducements are available for green IT investments?

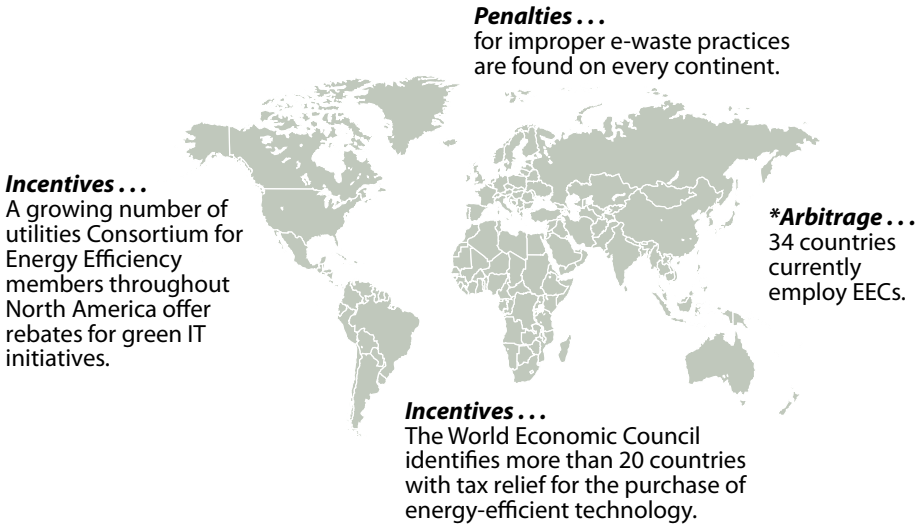
Government bodies and an increasing number of utilities have mechanisms in place that encourage business engagement in more environmentally sustainable behaviors. These mechanisms typically take on one of three forms: arbitrage, incentives, or penalties. Most North American programs tend toward fiscal incentives such as rebates and reduced tax liability, while the European market favors "polluter pays" principles that may also incorporate arbitrage and penalties (see Figure 2). Forrester recommends IT leaders get up to speed on the mechanisms available in their region, since the financial implications — both cost avoidance and savings — can be compelling and further improve the return on investment from green initiatives. Because incentive programs vary widely depending on your location of operation (e.g., state, country), a great starting point is to call your local utility provider and government representative.

7. How should I prioritize green IT investments?

The top motivation for pursuing green IT is to reduce energy-related operating expenses. This is not surprising, since energy conservation and efficiency initiatives offer tangible, and in many cases immediate, financial and environmental savings. As such, reducing energy consumption should be foundational to any green IT strategy. Forrester's green IT baseline can help IT leadership determine where to start, by capturing a holistic picture of energy consumption, CO_2 emissions, and financial costs of operating your entire IT environment within and outside of the data center.[10]

However, it's important to recognize that reducing energy-related carbon emissions and costs is just one facet of green IT. Taking a top-down and bottom-up approach might justify other green IT projects — or at least for different reasons beyond energy reduction. From the top down, align green IT efforts to your firm's companywide sustainability initiatives. For example, if waste reduction is a corporate goal, start by enforcing double-sided printing or ensure that you're recycling or donating your end-of-life IT assets. From the bottom up, take stock of pains in your IT shop like out-of-budget, out-of-power, or out-of-space challenges. As an example, if data center space is limited, server virtualization can free up space by reducing your physical server count — while at the same time reducing energy-related costs and carbon emissions, not to mention deferring major capital costs by extending the life of your expensive data center facility.

Figure 2 Mechanisms Exist Across The Globe To Incent Green IT Behavior



Category	Method	Example
Arbitrage	Energy Efficiency Certificates (EECs) quantifies energy saved from an investment in equipment or in processes.	In partnership with IBM, Neuwing Energy Ventures awards EECs for energy efficiency projects in the data center. These EECs are in turn used as tradable commodities on greenhouse gas exchanges, like the EU Emissions Trading Scheme and the Chicago Climate Exchange.
Incentives	Enhanced capital allowances (ECAs) allow firms to write off part or all of their capital costs investments in green technologies.	The UK government tax savings incentive allows businesses to claim 100% first-year capital allowances on their green IT investments.
	Energy Efficiency Rebates (EERs) offered by utilities for energy savings achieved through installation of energy-efficient technologies	Texas utility Austin Energy offers up to $200,000 per site, per year in rebates for pursuing more energy-efficient behaviors such as implementing massive array idle disk (MAID) storage systems, while California utility Pacific Gas & Electric (PG&E) offers a $15 rebate for each computer that has PC power management software installed.
Penalties	Legislation based on the "polluter pays" principle	Organizations that fail to comply with the major obligations for dealing with the disposal of IT assets under the Waste Electrical and Electronic Equipment directive may be fined up to €50,000 in Germany.

*As of December 30, 2008, Neuwing Energy and IBM Energy Efficiency Certificates (EEC) Program has expanded to include 34 countries, including the United States, Canada, Mexico, Ireland, UK, France, Germany, Italy, Spain, Belgium, the Netherlands, Denmark, Portugal, Luxembourg, United Arab Emirates, Saudi Arabia, Kuwait, Bahrain, Oman, Qatar, Egypt, Jordan, Pakistan, India, China, Singapore, Malaysia, Indonesia, South Korea, Thailand, Australia, New Zealand, the Philippines, and Japan.

47548 Source: Forrester Research, Inc.

8. Should IT leadership care who benefits from green IT projects?

In most cases, IT is not the financial benefactor of green IT projects. For example, only 11% of IT shops are responsible for paying their energy-related operating expenses — meaning that investments in energy efficiency and conservation will flow to someone else's budget, most likely the facilities group.[11] This is especially true for projects that green broader business processes, such as reduced travel expenses from video conferencing or reduced real estate costs by enabling work-from-home staff. With that in mind, Forrester recommends having a conversation with budget owners who will directly benefit from green IT initiatives. At the very least, this will ensure that IT's greening efforts will not go unnoticed — with the upside of receiving additional funding or even the financial savings.

ENDNOTES

[1] A full 67% of the 1,022 IT professionals surveyed in Forrester's Green IT Online Survey indicated the driver for pursuing greener IT operations was to "reduce energy-related operating expenses." See the December 15, 2008, "Market Overview: A Slowing Economy Won't Slow Down Corporate Green IT Initiatives" report.

[2] Source: Google, "Google's Green Initiatives: Efficient Computing" (http://www.google.com/corporate/datacenters/).

[3] Effective PC power management practices can save organizations millions of dollars per year. See the December 5, 2008, "How Much Money Are Your Idle PCs Wasting?" report.

[4] Recent estimates show that the real costs of paper add up to 13 to 31 times the purchase costs of paper itself. And while "paperless" technologies have helped reduce our need for certain paper products, copy paper remains the preferred medium for sharing ideas, storing information, and communicating with others. As a result, demand for copy paper has greatly increased. In the United States, 4.7 million tons, or 937 billion sheets, of copy paper were produced in 2001 — nearly 30% more than in 1995. Citigroup teamed up with the Environmental Defense Fund to reduce copy paper use. Source: "Copy This!" *The Environmental Defense Fund*, November 2004 (http://www.edf.org/documents/4138_Final%20Citigroup%20report_11-1-04.pdf).

[5] Source: VMware Customer Success Stories, "Solvay Pharmaceuticals Saves $1.5 Million and Meets Validation Requirements with VMware Virtual Infrastructure" (http://www.vmware.com/files/pdf/customers/07Q3_cs_vmw_Pharmaceutical_Solvay_English.pdf).

[6] The average IT organization is being squeezed in the vice-like grip of maintenance and support of ongoing operations. As much as 80% of the IT budget is being consumed by these activities, leaving only 20% for strategic initiatives and innovation. This is an untenable situation, yet there is no easy way out. A small number of organizations are taking an innovative and bold approach to their IT budgets by investing capital expense to offset high operating expenses. The result is bigger upfront cash outflows with a long-term favorable impact on operating expenses and positive contributions to the income statement albeit with a higher level of risk. See the August 29, 2007, "Financing IT Improvements" report.

[7] HP consolidated 85 data centers down to just six. The $100 million project is expected to provide savings totaling $1 billion. See the April 23, 2007, "HP: One CEO's View Of IT" report.

[8] While green IT is foundational, IT's ability to green the enterprise is strategic — and likely much more effective. And a number of leading organizations are paving the way. For example, Nike's "Considered Index" desktop application empowers designers to make more eco-friendly decisions when designing shoes, and UPS's package flow software to eliminate left-hand turns from delivery routes saved $8.4 million in fuel costs and 32,000 metric tons of CO_2 emissions in 2007. See the January 23, 2009, "The Rise Of The Green Enterprise: A Primer For IT Leadership's Involvement" report.

[9] Source: Ian Grant, "How Tesco will use £100m to improve carbon footprint," *ComputerWeekly.com,* July 4, 2008 (http://www.computerweekly.com/Articles/2008/07/04/231344/how-tesco-will-use-100m-to-improve-carbon-footprint.htm).

[10] The old adage that "you can't manage what you can't measure" is relevant to any IT project, green or not. When approaching green IT and energy conservation projects, do yourself and your business a favor by understanding how much energy is being consumed across your IT environment — within and outside of the data center. Not only will this help you prioritize green IT investments, but it will help you track progress over time. To do this, Forrester recommends measuring your green IT baseline — an annual estimate of the energy consumption, CO_2 emissions, and financial costs of operating IT. See the August 29, 2008, "Is Green IT Your Emperor With No Clothes?" report.

[11] Only 11% of 1,118 North American and European IT budget decision-makers include energy costs in their IT budget. See the March 27, 2008, "The State Of Enterprise IT Budgets: 2008" report.