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WHITE PAPER

Beyond Power: IT's Roadmap to Sustainable Computing

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October 2008

INTRODUCTION AND OVERVIEW

The Green IT debate has long focused on reducing the energy consumption of power-hungry systems in large data centers; however, businesses are now realizing that reducing energy consumption during the operation of assets is only part of the story. Manufacturing, distribution, and disposal of systems also require energy and contribute to the carbon footprint. Today, attention is turning toward a broader approach to reducing an organization's IT-related environmental footprint that also takes into account the entire lifecycle of IT equipment including acquisition, utilization, and retirement.

To date, reducing energy consumption has been the low-hanging fruit in the pursuit of corporate environmentalism targets as well as a top priority for companies seeking ways to reduce costs. IDC research has found that IT organizations rate power efficiency of products and systems as their number one concern (source: IDC's 2007 Green IT Survey). Although cost reduction is often the driving force, there are also positive environmental implications, and the two goals ultimately intertwine. For operational executives, the pursuit of cost containment through power reduction initiatives such as new data center designs and architectures, consolidated facilities, consolidated servers, blade technology, and virtualization has led to environmental sustainability or "Green IT" benefits and reductions in carbon emissions. Yet, this is not enough.

Pushing beyond a sole focus on power consumption, enterprises are now deploying more far-reaching optimization strategies to achieve a broader reduction of their carbon footprint and expand their corporate social responsibilities, all without necessarily incurring additional cost. CIOs and IT managers must assess the entire lifecycle of their enterprise computing infrastructure. For hardware, such assessments should consider the way systems are manufactured and delivered, deployed and utilized, all the way to the manner in which they are retired at the end of their life. To date, very few companies have taken such a comprehensive approach to hardware lifecycle planning for environmental sustainability.

Furthermore, even companies with mature asset management practices tend to take only a limited and fragmented approach to managing for sustainability. This is unfortunate, as the data is becoming available to rationalize comprehensive best practices for reducing the impact of IT on the environment, while simultaneously improving the financial productivity of the hardware/software portfolio.

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White Paper Objectives

This white paper focuses on the role of the entire IT asset lifecycle in enhancing a company's sustainability objectives. It will argue that organizations must take into account a broader approach to environmental footprint reduction, which in turn helps them reduce their operational costs. This paper will focus primarily on the mid- to end-of-life portions of the cycle and will present a blueprint of the required components of a sound IT asset disposal (ITAD) and Lifecycle Management for Green IT strategy, what companies should consider and what companies should avoid.

Corporate Sustainability and IT Asset Disposal Roadmap

The concept of sustainability has been a difficult one to incorporate into day-to-day practices. This is because it has typically been imposed from the top of the corporate pyramid as a way to respond both to the global climate crisis and to costs spiraling out of control. Notably, the latter has been partly the result of the former.

Customer and Regulatory Pressures for Sustainability

With an intense debate over climate change, most leading corporations have made public pledges to reduce their carbon emissions. These pledges have been the result of growing pressure on businesses from customers demanding more environmentally friendly products and governments in key economies enacting a growing body of regulations that force manufacturers and end users to reconsider their own practices. Investors are also placing environmental accountability demands on businesses, with some of the world's largest institutional investors pressuring their companies to incorporate environmental risk when reporting their quarterly results. Pressure is also growing on U.S. Congress and the U.S. Securities and Exchange Commission (SEC) to take actions such as requiring publicly traded companies to incorporate environmental and sustainability metrics in their reports. Taken together, these events indicate that corporate environmental reporting is likely to become more widespread in 2009, and accelerate even further thereafter.

Companies Struggling to Establish, Implement Sustainability Goals

In response to these pressures most leading companies have agreed to the idea of sustainability reporting and have committed to reducing their environmental footprint in a gradual manner. However, with the lack of clear guidelines and data gathering capabilities, operational units are now struggling to find ways to implement sustainability goals and transform them into reality.

For operational units, the challenges are enormous. Optimization with such targets as reducing energy consumption, optimizing facilities, consolidating data centers and hardware, reassessing their supply chain, and revising work policies to promote items such as telecommuting have been focal points for operational leaders at all levels. Many companies have established sustainability committees consisting of managers from various business units tasked to create a sustainability roadmap.

While these committees are focused on all aspects of their business' operations, IT is an important function that contributes to the overall corporate sustainability policy. Just like other functions, its challenges are significant.

BEST PRACTICE PRINCIPLES

A few years now into the Green IT debate, the reality is that no single company has yet achieved a strategy that could be identified as a "best practice." Instead, several leading companies have managed to deploy pockets of excellence in approaching sustainability through greener IT. The lack of an agreed-upon, cohesive approach is the result of several factors, the most important of which are organizational and structural.

Organizational Barriers to Implementing Lifecycle Sustainability

When designing their IT infrastructure, very few organizations take into account the full ecological impact of their IT deployment. Most corporate IT strategies rely on a piecemeal approach that segregates the various tasks and functions with the IT infrastructure. To illustrate, tasks such as procurement are generally separated from disposal practices, with different managers with different skill sets handling each task and rarely communicating with one another. Deployment techniques don't take into account the requirements of the inevitable removal of the equipment from the network at the decommissioning phase.

Structurally, the IT organization is generally the sole owner of the core IT infrastructure, despite its exposure to compliance and security issues that would entail the involvement of compliance or legal officers. This can create a problem, as IT may not be the best-equipped organization to assess risk and manage it. Similarly, the IT organization is separated from the finance organization and may not be in the best position to assess the cost-benefit ratio.

This ecosystem of disconnected stakeholders gets even more complicated with very large organizations and IT infrastructures. For instance, in large companies, while IT manages the data center, facilities management pays the power bill. In this case, there is no direct incentive for IT to look at power cost reduction. Furthermore, as IT is commonly part of executive management and considered to be a critical part of the corporate architecture, facilities management may have limited ability to influence IT.

ITAD: Least Understood Function in Lifecycle Management

One of the least analyzed functions in the IT infrastructure lifecycle is hardware end-of-life or retirement. Hardware decommissioning has long been relegated to an afterthought, with very little or no planning to incorporate sound economic or good environmental practices. ITAD has also been the least well-governed part of the lifecycle, with missed opportunity to maximize ROI. As companies now begin to revisit the way they handle retired assets, they must be clear on the objectives they seek to determine the proper disposal approach. These objectives should be incorporated

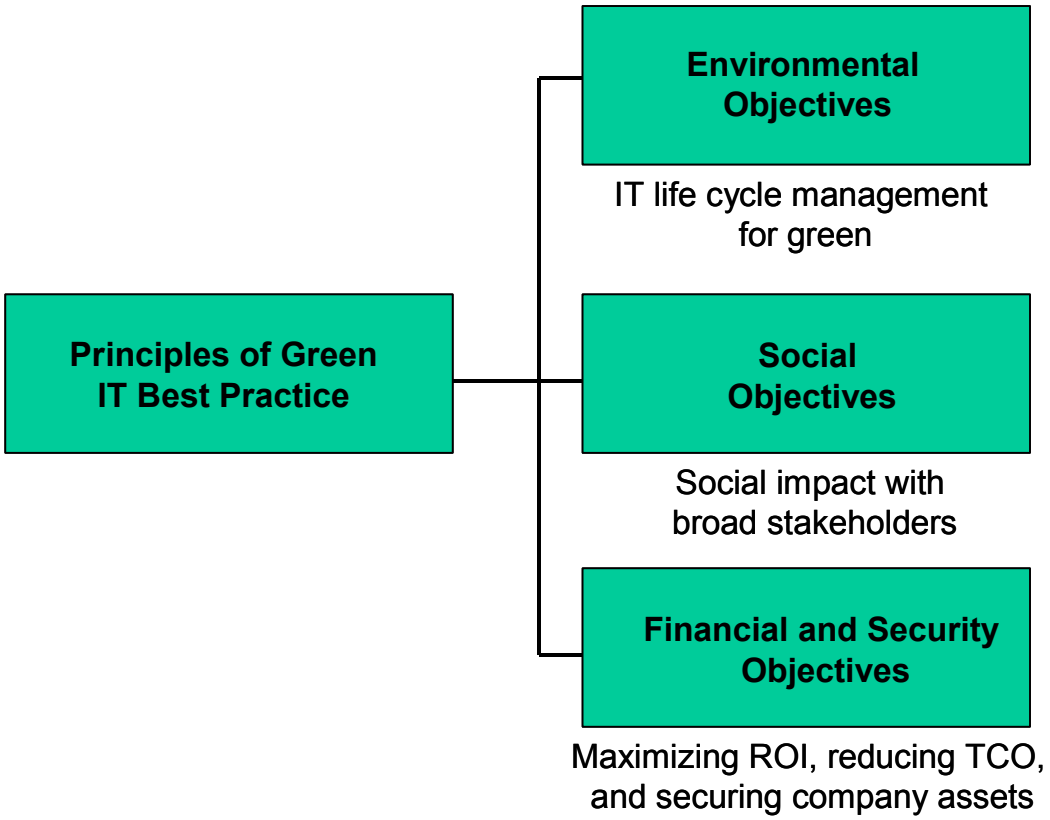
into the company's Corporate Social Responsibility (CSR) statements and overall sustainability policy. Figure 1 provides an illustration of some of the key components of a corporate Green IT best practices policy.

Setting the Appropriate Corporate Sustainability Policy

When it comes to setting an IT hardware retirement and corporate sustainability policy, three areas of focus should be considered. They are environmental, social and financial/security objectives (Figure 1). The remainder of this white paper provides guidance on how to define objectives in each of these three areas.

FIGURE 1

Components of a Corporate Green IT Best Practice



Source: IDC, 2008

ENVIRONMENTAL OBJECTIVES

In broad terms, the ultimate goal is to eliminate the factors that contribute to the global climate problem and reduce waste that can enter landfills and have negative impact to human health. While carbon emission is one of the primary culprits, elimination of waste is another important goal.

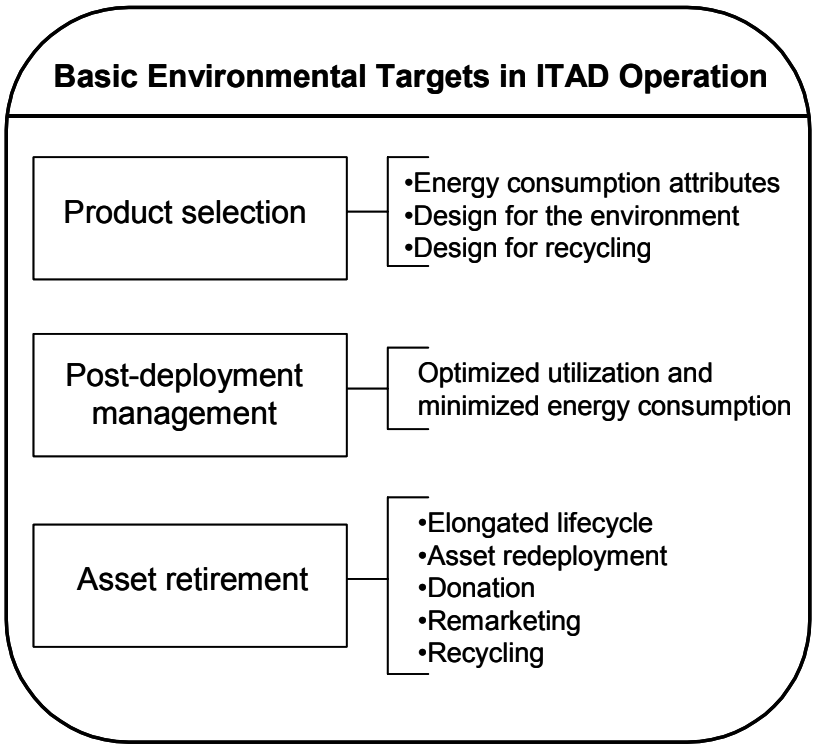
To optimize sustainability in their IT infrastructure, companies should focus on each state of the IT lifecycle, including:

- **Product selection characteristics**. Product selection should take into account the following criteria:
  - **Energy consumption**. When purchasing a system, procurement managers must consider more than just the traditional IT metrics. Products that feature Energy Star 4.x, 80Plus, EPEAT and other standards should be more energy efficient than comparable products without these certifications.
  - **Design for the Environment (DfE)**. Products should be selected that meet specific environmental design standards that include the reduction or elimination of toxic elements such as lead and cadmium.
  - **Design for Recycling (DfR)**. Products should be selected that boast modular and intelligent designs meant to facilitate and maximize dismantling, re-use, and recycling. DfR not only maximizes the re-use of the components during the recycling process, but reduces labor costs at the demanufacturing phase. DfR also includes proper assembly/disassembly documentation for recyclers to incorporate into their demanufacturing processes.
  - **Used equipment option.** While in many instances new equipment may operate with better energy efficiency than older models, there may be other instances where the benefits of not having to manufacture and ship new equipment or decommission the used equipment weigh in favor of using used rather than new.
- **Post deployment management**. An increasing number of options are becoming available to optimize systems during their operating lifetimes. Several solutions exist that monitor and adjust power consumption, for example, which helps reduce both costs and carbon emissions.
- **Asset disposal and managing end-of-life**. The goal of all organizations should be zero environmental impact when retiring their assets. Although this is virtually impossible today, companies have several choices to minimize their hardware retirement impact. These include not only recycling, but also elongating the asset's lifecycle through redeployment, donation, or remarketing.

Environmental considerations at each stage of the IT lifecycle stages are displayed in Figure 2.

FIGURE 2

The Environmental Angle



Source: IDC, 2008

Of all the components of the IT lifecycle, hardware asset retirement has the most significant impact on the environment. The physical handling and final disposition of decommissioned hardware can be the determining factor in whether an organization controls its environmental impact and risk or contributes to greater socioeconomic decline. The following sections address the topic of asset disposal in greater detail.

Asset Disposal Options to Reduce Environmental Impact

The first rule in IT Asset Management is that without assessment and disposal policies, organizations can impose detrimental consequences on the environment. Lax retirement policies have resulted in such environmentally damaging outcomes such as CRTs found in rivers and PCs dumped in landfills, where toxic materials can be introduced into the environment. The risks of such negative outcomes are particularly acute when e-waste is exported to developing countries with less stringent environmental enforcement. Exploring options and adopting the right disposal process should be a priority for any organization.

The second rule is that there is no one-size-fits-all process that companies must apply. Every organization has its own needs and requirements and each should identify the right solution based on its risk tolerance, environmental stewardship, and cost profile.

The primary methods available to organizations to dispose surplus and decommissioned assets consist of elongating their lifecycle, redeploying them, donating them, remarketing them, or barring any re-use options, recycling them.

IT Asset Lifecycle Elongation

While IT asset lifecycle elongation is not a retirement method, it nevertheless defers the introduction of e-waste into the disposal stream. For companies looking to improve sustainability there can be incremental environmental, social and financial benefit to elongating the lifecycle of equipment, and it can help defer the cost (both to the environment as well as to the company's bottom line) of purchasing new equipment and of recycling end of life equipment. Combining refurbishment services and procurement of model stock used equipment with normal asset recovery processes can be an effective strategy to yield optimal results.

Many companies that choose to elongate the life of their IT assets select this option almost exclusively based on cost considerations. In fact, such decisions are often made by financial officers and not IT managers, as it is often perceived to be a lower-cost alternative than engaging in new procurement. However, extending the life of IT hardware can also have positive environmental consequences as well. In addition to avoiding the cost of procurement and new system deployment, extending the life of existing hardware means that less hardware is moving downstream, less waste is generated, and fewer resources and carbon are used in the upstream manufacturing and supply chain for new systems.

As such, a reduction in carbon emissions could be achieved, quantified and factored into the company's environmental stewardship assessment and reporting. To accomplish this, companies can simply decide to lengthen the lifecycle of existing assets, or for assets about to be retired, they can redeploy these assets into other job functions that could still leverage the use of the systems.

Some of the factors organizations should consider as part of their lifecycle extension activities include:

- **Mid-life refurbishment.** Different from redeploying end-of-life or surplus equipment, mid-life refurbishment consists of strategically recovering and refurbishing equipment (augmented with procurement of like-model used equipment) to extend its life while reducing cost and environmental/carbon impact. This strategy can also be employed to prepare equipment for the next generation of OS, for example by boosting RAM, upgrading video cards, etc. Kitting systems with new peripherals such as mice, keyboards, and monitors can increase end user satisfaction with the systems, overcoming a common barrier to redeployment efforts. Mid-life refurbishment efforts can be incorporated into day-to-day business cycles and assets can be recovered and refurbished during normal business changes such as reductions in the workforce, mergers and acquisition, employee turnover, etc.

- **Hot spare replacements.** Inventorying model-stock used equipment for temporary replacement of warranted equipment or permanent replacement of out-of-warranty equipment can reduce new procurement cost and environmental/carbon impact.

- **Leased equipment.** Ensuring that equipment returned on lease is complete and functional will increase the likelihood that equipment will go on to have a productive secondary life and not be improperly disposed or exported by lessors. Also, companies can implement tracking mechanisms to ensure the leased equipment is not exported or landfilled by downstream handlers.

- **Equipment storage.** While still a significant disposal method, simply storing equipment can significantly reduce the viability of the equipment's re-use, decrease its ROI, and increase security risk.

Economic Arguments Favoring Longer Lifecycles

The current economic slowdown has become a critical factor in decisions affecting procurement, IT lifecycle and changing behaviors. While there will always be companies that require a more aggressive refresh cycle, with applications requiring the deployment of the fastest chips that enable speedier processing and delivery of output, to more memory for the use of multiple applications, to better graphics performance for design and engineering, there are a great many others for whom cost considerations are paramount.

IDC believes the economic slowdown will have a dramatic effect on new equipment sales and will boost the support services that enable further use of existing equipment. IDC believes that a reluctance to incur the costs of replacing older equipment will drive companies to support longer lifecycles (IDC report #212322, Worldwide and U.S. Hardware Support and Deployment Services 2008-2012 Forecast).

In broad terms, extending the life of a computer system provides a number of economic benefits:

- **Lower total cost of ownership (TCO).** Extending the life of systems can reduce TCO by reducing the cost of new procurement for replacement systems, retirement of existing assets, and labor cost for transition activities such as re-imaging, deployment, and testing.

- **Improved asset return on investment (ROI)**. The proper handling of existing assets, combined with a better managed refresh cycle can yield a better ROI for IT equipment. Reduced cash requirements for procurement can have short-term benefits for the company's cash flow and reduce the need to secure financing. This may be particularly true in organizations where budgets are tight or where a rapid refresh cycle does not necessarily add to productivity in ways that can be measured.

Redeployment

Redeploying IT equipment to other areas of the company that can still obtain value from the assets can go a long way toward controlling carbon emissions, waste, and cost. Note that redeployment consists of more than simply handing off outdated equipment to another part of the organization. Done correctly, it should include testing, refurbishment, and upgrade of the equipment as necessary. It also includes cleansing, re-kitting and re-imaging to give the user a more "like new" experience.

Donation

Companies frequently resort to donation as a means of disposal. While generally speaking, donation is a good practice, most companies that use this method often fail to incorporate environmental stewardship into the process. Most companies donate PCs and other electronics without subsequent monitoring of such hardware and how it is retired when finally decommissioned. In ongoing annual surveys, IDC found that donation to a third-party is practiced by more than 40% of companies in the United States, with employees being a widespread target of donations.

By establishing proper monitoring of donation and resell programs, companies should be able to obtain environmental benefits. They can ensure that the hardware will continue to be utilized, hence eliminating the need for new purchases and the carbon and other resources required to generate those new systems, while assuring that the assets will be disposed of in an environmentally responsible manner. Programs such as the Microsoft Authorized Refurbisher program can also help recipients to image necessary operating systems and business software onto donated equipment at a nominal expense.

Remarketing

Remarketing is another option available to companies looking to extend the life of their IT assets. It allows companies to obtain some replacement value to reduce the total cost of ownership for equipment that has no internal reusability and would otherwise need to be donated or recycled. This is an option available for products that meet specific standards based on age, processor type, product quality, and demand.

While remarketing may be particularly attractive for companies or even business units within companies that rely on the latest technologies to remain competitive and therefore have rapid refresh cycles, remarketing is also an option for equipment up to 6-7 years old.

Companies considering this option should ensure that the equipment is complete, tested for operability, and refurbished as necessary to increase value and remarketability; refurbishment could include repair, upgrade, kitting with new peripherals, and new software imaging.

But remarketing retired assets requires specialized skills that include a strong understanding of the financial market and a presence in the secondary channel to ensure the resold equipment is indeed being utilized and not simply stripped of its material value with the remainder dumped in a landfill. As such, companies seeking to maximize their retirement strategy should seek expert service providers that perform these types of remarketing tasks.

SOCIAL OBJECTIVES

While proper lifecycle management can greatly boost a company's ecological and environmental sustainability position, it can also contribute to achieving goals on the social front. Hardware retirement practices are the primary concern in this regard.

In addition to seeking carbon neutrality, a proper asset retirement strategy should seek sustainability in the communities where companies operate. The following social objectives should be considered:

- **Contributing to closing the digital divide through managed proactive donations**. Businesses once used donations as a way to expedite retirement of their old assets and attempt to transfer responsibility to charities, but such donations have drastically slowed during the past several years as businesses have become more concerned about security and environmental issues and charities have wised up to the issues involved. PCs that may be old but are in good working condition are in high demand in developing nations; unfortunately, most of what's exported is inoperable junk stripped of any valuable components. Of particular interest are non-profit organizations, school systems even in mature markets like the U.S. where the cost of acquiring technology remains prohibitive, and local communities where companies operate around the world. Providing usable systems to under-served communities can help to reduce the digital divide around the world while deferring e-waste from entering the waste system.

- **Avoiding unethical labor practices**. The asset disposal industry has long been plagued by representatives that have utilized, and in many instances still utilize, practices considered unethical and socially questionable. Among the least monitored practices is the use of prison labor, which some asset disposal companies use to keep their costs down. Unfortunately, the use of prison labor allows asset disposal companies to get around health and safety laws, undercuts the financial well-being of legitimate ITAD vendors, invites security risk with felons wiping potentially sensitive data, and opens the client companies up to association with what can be perceived as unethical activity. As companies become more aware of the impact of their disposal practices and document progress in their Corporate and Social Responsibility policies, they should work to ensure that such practices are not used.

- **Controlling unethical exports**. While the objective of recycling is zero waste, with current technology that goal is not currently possible. With unethical asset disposal companies, a sizeable share of the electronics collected for recycling end up in landfills overseas and has a dramatic negative impact on the global ecosystem and human health. Companies should work to ensure that their asset disposal policies require transparency to the downstream handing of their retired IT assets and auditable proof that disposition methods are in accordance with organizational standards and meet or exceed all current and pending regulatory requirements. Disposal companies that exceed existing federal, state, and international e-waste handling and management regulation standards are in leading positions to handle regulatory interpretation and can protect their customers against the inconsistent application of hazardous waste regulation to e-waste.

FINANCIAL AND SECURITY OBJECTIVES

The management of corporate IT assets and their disposal should ensure that the interest of financial stakeholders is being maximized, both in terms of containing costs as well as supporting the company's operations to maximize efficiencies and top-line revenue growth. While a decade ago, managers may have thought of environmentally responsible IT policies being at odds with achieving financial objectives, the fact is that a greener IT policy should lead to financial efficiencies and possibly substantial reductions in operating costs. Financial benefits in IT asset disposal practices can take several forms including security and data privacy, cost containment, and maximizing ROI.

In terms of security and data privacy, protection against loss of data should be the company's primary consideration when assessing its ITAD strategy. Data leaks can lead directly to financial losses, due to the loss of corporate intellectual property and/or private customer or stakeholder data. Additionally, state, federal and international regulations require companies to take drastic measures in the event of critical data loss.

Further, when it comes to IT asset disposal, financial and security objectives are strongly linked. The loss of critical data can damage the company's brand and image. The wrong asset disposal strategy could result in breaches of sensitive data, customer defection, substantial notification costs and loss of internal productivity. Ensuring that the company's chosen ITAD practice incorporates protection of intangible assets is an important consideration. Additional ITAD-related financial and security issues include:

- **Compliance with stringent, evolving security regulations.** A company's ITAD function must ensure that it has sufficient expertise in legal and compliance issues. Whether performed internally or through a third party, the team in charge of ITAD must understand existing compliance mandates in the United States and worldwide, including but not limited to the Safe Harbor Principles, California SB-1386, Gramm-Leach-Bliley Act, Sarbanes-Oxley Act, Health Insurance Portability and Accountability Act (HIPAA), New York Information and Security Breach Notification Act, and the countless other laws in the European Union, Japan, China, and other regions where the ITAD services are performed. These teams should demonstrate how these laws apply to the ITAD function in particular, and establish processes to comply and document compliance.

- **Security posture.** The lack of a comprehensive security posture related to an ITAD operation can be source of monetary losses and brand equity erosion. For example most companies are not aware that a transfer of asset title does reduce the original company's liability. This is particularly important when it comes to managing donations. In this case, the company and its ITAD provider should determine the accountability rules for the chain of custody system they decide to implement.

- **Design for financial optimization.** In designing a corporate ITAD function, companies should look for financial optimization, with a focus on cost containment and possibly residual value capture. Designing an intelligent ITAD practice begins at the procurement phase, during which a refresh and disposal strategy can be put in place to explore optimal utilization and potential residual value capture at the end of the primary lifecycle. The strategy can also take into account classic IT deployment functions such as general asset management, equipment location and deployment, and technological assessment at retirement. At the end of that phase, the value of the retired asset can be captured in the company's accounting systems as an offset to the asset's total cost of ownership.

Regardless of what ITAD strategy a company selects, understanding its financial or accounting ramifications is important. For some companies, the primary financial value is in extracting some revenue from the resell of assets, while others prefer donation to boost their image while reducing their tax obligations, and still others require minimization of financial liability through secure asset disposal. While no single solution fits all companies or all circumstances, the use of qualified ITAD experts should help determine priorities, processes and expectations.

CHALLENGES

As companies design a greener IT lifecycle asset strategy that meets some of the specific targets and processes articulated in this white paper, they must be aware of the existing pain points that are a challenge to the sector. The following are some of the issues worth considering.

Accountability in the Recycling Industry

Although re-use, remarketing and donation help ensure a longer lifespan for IT hardware, all assets must ultimately be recycled when the hardware is no longer useful. Unfortunately the recycling industry today is operated in ways that escape full accountability.

Despite promises of full "recyclability," there is both anecdotal and scientific evidence that show that most current recycling practices fail to deliver on their promise of 100% re-use. According to the U.S. Government Accountability Office (U.S. GAO), many recyclers are also exporting despite promises on their website to the contrary. E-waste is still generated, toxic elements are not fully secured, and scrutiny is not sufficient. Exports to countries with weak environmental laws continue unchecked. The ecological impact of non-accountable and unethical recycling practices can be detrimental, as they can release toxins and contaminated materials into the environment. This sorry state of affairs is the result of several factors:

- The industry operates using legacy techniques and technologies that may not meet current needs, resulting in greater waste than could otherwise be achieved and higher toxic emissions in the recycling phase.

- E-waste recycling has not been of major interest to the market in general, and as such, failed to attract sufficient capital to meet its upgrade needs.

- Laws and regulations are limited and unenforced, leading to ambiguity whether electronic scrap is constituted as hazardous waste and regulated as such. Recyclers also limited knowledge of solid waste regulations and requirements.

- Auditable industry practices are lacking; IDC's G.R.A.D.E. certification helps identify recyclers focusing on these issues, but no industry standards currently exist to routinely measure a recycler's ability to meet zero-impact objectives.

- The industry is cost-intensive, requiring substantial investments to establish recycling facilities and subsequent conversion operations that would move the recycled materials into the global commodity market.

- Companies perform insufficient due diligence to properly inspect and scrutinize the recyclers they choose.

Without new accountability rules toward customers, the recycling industry could face an even more challenging obstacle. As demand for recycling grows, the industry could be tempted to avoid making improvements precisely because of the volumes it will be processing.

Lack of Sustainability Metrics and Reporting

Because of the shortcomings of the recycling industry, companies are faced with limited knowledge about how their assets are recycled and what their ultimate gains in environmental sustainability efforts are. Insufficient reporting and metrics on recycling outcomes is an enormous disadvantage not only in environmental terms, but also in terms of meeting transparency rules and requirements and corporate social responsibility requirements.

Need for Greater Transparency Regarding Material Analysis and Extraction

Technology today allows a better control of recycling techniques and a more transparent and in-depth reporting of outcomes at a relatively low cost. For example, techniques exist to better assess what specific IT assets would yield in terms of materials even before they are retired. Other technologies maximize material extraction in ways that full recyclability is achieved. But IT managers or their colleagues in charge of asset retirement are generally not knowledgeable on material analysis and extraction.

Taking an average printer for example, IDC estimates that steel accounts for about 37% by weight. Copper is about 10%, and plastics represent more than 40%. Other materials include brass, stainless steel, and electronic boards. There are several techniques that enable engineers to measure an IT asset's material constitution, even at the single unit level, providing companies with the ability to understand how their IT hardware infrastructure stacks up from an environmental standpoint. Recyclers and asset disposal service providers should be equipped to incorporate such offerings in the service portfolio.

These techniques enable companies to understand the amount of toxic materials their IT infrastructure carries. Within IT systems, electronic boards are a dominant component of the hardware, and also a source of toxic materials. In our printer example, toxic elements like lead, arsenic, antimony, barium, chromium, and a number of other products can be quantified and properly treated. Today, most recycling operations fail to report on these extraction details and that is detrimental to their customers.

PROPOSED APPROACH: SECURE EXPERT OUTSOURCED ASSISTANCE

With so many available options, companies should carefully consider their choice when selecting the right IT asset lifecycle and retirement strategy. Given the complexity of the tasks, it is generally out of the scope of an IT department to handle asset disposition on its own. IDC recommends that companies hire a professional service firm with specific knowledge regarding asset management and disposal handling to perform a complete assessment covering environmental, social and cost and security concerns.

Companies should have the service provider conduct an inventory of their assets, along with an analysis of the company's utilization profile, which would determine which solution fits best. Such an assessment should address the following questions:

- **Environmental Impact of Elongated Lifecycle and Re-Use**
  - What value does a longer lifecycle and reutilization strategy bring to our carbon emission position? Can these emissions reduction be quantified?
  - Where are the maximum gains achievable by pursuing a longer lifecycle and re-use strategy? Is more sustainability attained via internal redeployment or through donation?
  - Assuming CO_2 emission reductions through a longer lifecycle, what are the relative financial ramifications of redeployment versus resale versus donation based on the company's current and projected installed bases?
- **Environmental Assessment of Aggressive Replacement Cycle and Remarketing**
  - What is the expected length of the secondary lifecycle? Can emission reduction be quantified for the period of the secondary lifecycle?
  - Can a comparative environmental assessment be performed on the expected new PCs and other systems that the company would need to procure versus the current installed base? Such environmental assessment must include energy consumption and product design.

Another key consideration is accountability in its recycling practices. Accounting for socially responsible practices regarding commodities and toxic materials must be a priority. Companies must secure recycling providers that incorporate serialized assets for mass balance accounting, toxin tracking, and materials and parts disposition reporting. Recycling providers must also provide environmental vetting standards that include:

- Sufficient capabilities in terms of infrastructure, processes, and markets for processing various types of equipment.
- Evaluation of the commercial quality of process output, i.e., everything must be sellable to a legitimate buyer.
- Emissions and local health/environmental impact.
- Accounting systems for reconciling mass balance amounts by commodity, i.e., ensuring that input = output.
- Global applicability: ensuring that recycling activities are responsible and accountable in every operating theater.

CONCLUSIONS

Although it may seem daunting, the task of greening a company's IT infrastructure lifecycle, and in particular its asset disposition practices should be simple to implement while the rewards and payoffs can be positive. In the ITAD sector, adopting rules and practices that contribute to reaching the company's environmental, social and security targets should also lead to substantial gains for the company's bottom line, while securing vital assets and protecting brand image. When designing ITAD practices, companies should ensure that overall guidelines listed in this white paper are met, or at least addressed and discussed with their selected service providers. Failure to address these key issues could lead to substandard practices that may drag down the organization's effort to reduce its carbon footprint and document it properly.