Leveraging IT in Building Green Businesses

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Industry Insights
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This study looks at how businesses within the manufacturing, energy, retail and financial services sectors are working to create more sustainable business practices. In its most basic definition, sustainability means "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Our research applies the term sustainability primarily to include company initiatives or policies related to environmental or green issues. As these organizations seek to become "green", we expect to see greater investments in IT to aide their efforts. This study identifies those technologies we believe will see the biggest uptake from organizations engaging in sustainability efforts.

Industry Insights Opinion

With attention focused on global climate change and the pressure to reduce the emissions of greenhouse gases (GHG) such as carbon dioxide, methane, and nitrous oxide there has been much attention paid to the role of IT. However, Energy Insights estimates the GHG emissions from IT only account for 3% of the energy related carbon dioxide emissions in the U.S. commercial sector, or 0.6% of the total. The other 97% is comprised of the following segments: transportation (33%), industrial, which is dominated by manufacturing (28%), and commercial and residential, which is primarily related to buildings (36%). To make significant headway on reducing GHG emissions, businesses need to look beyond the GHG being generated from the IT department and instead focus more broadly on what "green" means to the future of their industries and their businesses.

Many businesses today are on their way down the "green" path. They have sought out alternative energy, redesigned their buildings, created more eco-friendly products, and are pressuring their suppliers to do the same. Specifically, we see companies in the energy, manufacturing, retail and financial services industries taking leadership roles in sustainability. As business leaders have already demonstrated, IT can and should play an important role in sustainability.

For businesses embarking on a sustainability initiative, one must not overlook the leverage that can be attained through the proper implementation of IT. For technology suppliers, sustainability initiatives will present a new opportunity. But they will also present a new set of requirements for existing products and services. This study identifies those technologies we believe will be called to action most frequently in sustainability efforts.

Situation Overview

With attention focused on global climate change and the pressure to reduce the emissions of greenhouse gases (GHG) such as carbon dioxide, methane, and nitrous oxide there has been much attention paid to the role of IT. However, Energy Insights estimates the GHG emissions from IT only account for 3% of the energy related carbon dioxide emissions in the U.S. commercial sector, or 0.6% of the total. The other 97% is comprised of the following segments: transportation (33%), industrial, which is dominated by manufacturing (28%), and commercial and residential, which is primarily related to buildings (36%). To make significant headway on reducing GHG emissions, businesses need to look beyond the GHG being generated from the IT department and instead focus more broadly on what "green" means to the future of their industries and their businesses.

To reduce one's carbon footprint, businesses need to focus on developing environmental sustainability in those business practices that fall outside of the IT department as well. We believe the utilities, manufacturing, retail and financial services industries will be early adopters in sustainability efforts either because they have the greatest carbon footprint or because of their relative size in the overall economy.

Utilities and manufacturers can have a significant impact in reducing GHG emissions given their current carbon footprint. Power generators are among the companies with the largest carbon footprint when it comes to direct emissions of GHG. According to the Department of Energy, Energy Information Agency (EIA) report Emissions of Greenhouse Gases in the United States 2006, power generation made up 39% of the energy-related and industrial-process related carbon dioxide emissions in 2006.

Manufacturers are also considered to be large GHG emitters given the amount of energy consumed during the manufacturing and related transportation processes. Retailers also figure largely into the energy inefficiency picture, especially when one applies "chain math". Multiply the energy inefficiency taking place in a single store by the number of outlets in that chain and the impact on the planet is great.

Lastly, as financial services is one of the largest industries, we already see these organizations keen in taking a lead in developing sustainability efforts. Many of the efforts in this industry are led by those global institutions that are adapting to impacts of the Kyoto Protocol in many of the countries in which they operate. In these countries they must take measure to reduce their carbon footprint or face financial penalties – a highly motivating force.

This study looks at each of these industries and the steps they are taking outside of the IT organization to develop environmentally sustainable business practices. Although these businesses are working to reduce GHG emissions outside of the IT department, it is not to say there is no opportunity for IT in their solutions. In fact, we expect to see significant IT investments as businesses seek to obtain better information on their own green activities.

Green Manufacturing

Manufacturers are tackling their "green" efforts from a number of fronts ranging from recycling of materials and components to modernization of plant floor equipment to applying water conservation methods. Forward looking manufacturers are thinking about their efforts in terms of a sustainability framework. These manufactures are no longer employing a one-dimensional view in which they conform to a single regulation or requirement. Rather, they take a broader view that applies corporate responsibility and governance throughout the product life cycle. As they progress in their sustainability maturity, manufacturers adopt a total life-cycle view of sustainability, trying to balance conflicting business drivers and weigh design alternatives that would provide the highest level of sustainability at an affordable cost.

The notion of design for sustainability is one of the more interesting examples of how a business network is brought together to achieve the highest possible level of performance. Sustainability addresses the fact that companies need the ability to introduce new products (or adapt old ones) that are more easily recycled, with product life extensions, biodegradable packaging, and more environmentally friendly production processes. It allows all relevant participants to assess the impact of product-related decisions like material selection or maintenance practice on any and all regulations, and, because they are involved early in the process, they can identify compliance infringements and suggest design changes before the non-compliant design is locked in. For example, incorporating design for sustainability in the early stages of a product life cycle to reduce potential environmental damage during equipment service (e.g., collection and disposal of lubricants and refrigerants), and assess the impact of compliance on repair time and costs.

Design for sustainability stresses the need to evaluate alternative designs; it weighs the incremental costs of incorporating onboard capabilities versus the application of external tools to reduce environmental damage during operation and maintenance. For example, designers can assess the direct and indirect costs, hazardous waste, and emissions resulting from the use of photodegradable materials against the long-term environmental benefits of these materials. To some extent, it helps to focus on the basics.

To understand the priorities and trade-offs companies are making, we relate sustainability to the following five basic categories:

- Material Selection. Evaluating materials selected during the design phase against regulatory compliance, customer mandates, and corporate sustainability requirements. Coca-Cola recently expanded its long-term recycling goals to recycle or reuse 100% of the aluminum beverage cans it sells in the United States. The company had previously announced its goals to recycle or reuse 100% of its PET plastic bottles. Coca-Cola currently uses on average 60% recycled aluminum in its beverage cans. As part of its goals, Coca-Cola invested $60 million in 2007 in a series of recycling initiatives, including construction of a PET bottle-to-bottle recycling plant in Spartanburg, South Carolina.

- Sourcing policies. Defining the requirement for procurement policies, procedures and supplier qualification, taking into consideration issues such as transportation, quality, resources consumed during production, disposal of by-products, and emissions. Praxair has a goal to reduce greenhouse gas emissions by 8% and water usage by 10% over a 10 year period. Their approach is to define supplier expectations to meet or exceed all applicable Praxair environmental and materials handling policies. They are also seeking to minimize fuel consumption of their distribution fleet, improve energy efficiency of systems and processes, and selectively add incremental production capacity in certain local markets to improve overall efficiency and reduce transportation costs. To achieve their goals, technology has played and important role. Praxair has deployed advanced control systems to optimize production processes. It is using analytic programs to evaluate the aerodynamic performance of compressors and expansion turbines. And it is using its logistics system to make decisions about the balance between high customer service levels and minimized fuel consumption, air emissions, and operating costs.

- Resource consumption and emission. Examining the consumption of limited resources, specifically energy and water; greenhouse gas (GHG) and other relevant emissions; and carbon footprint calculations. Whirlpool, as a home appliance manufacturer, takes part in the voluntary ENERGY STAR program related to resource-efficient appliances as just one of its environmental

initiatives. What is most interesting is that Whirlpool's strategy comes down to a very simple question - What is the environmental impact of its products during each of four stages defined as production, distribution, use and disposal? The majority of pollution created by an appliance occurs during its in-home use, often more than 10-20 times higher than during its production, distribution, or disposal life-cycle phases. As a result, Whirlpool focuses on the use stage of its product to reduce its carbon footprint.

- End-of-life (EOL) postponement and management. Focusing on quality and service (including warranty service) of the product, as well as recycling, reuse, and disposal at EOL. We generally value labor costs in service against a product's (not a part's) replacement value, and as a result, consumers often opt to replace rather than repair. Lowering the cost to repair will be critical for success.

- Customer demand and fulfillment. Balancing issues such as customer demand for new options in packaging types and sizes, consumption patterns, or even alternative products with the challenges of building sustainability into products, packaging, warehousing, and distribution. There's an element of demand shaping to this and a need to encourage consumers to accept either more limited selections or higher prices for greener alternatives. Given most surveys show that consumers are reluctant to pay more for green products, the pressure will be on identifying cost savings for either the manufacturer or the customer.

As part of our research, we've considered the fact that overall business goals may also challenge the notion of sustainability. For example, customer service and product availability are obviously essential to a company's long-term success. Yet, applying green priorities to the supply chain could mean that companies need to stop and think before they automatically send a partial shipment to a top priority customer. Although the manufacturer may be willing to absorb the additional financial costs to achieve excellent customer service, has the company or the customer considered the extra fuel consumed and larger carbon footprint associated with partial shipments? Is there a way to redefine customer service that incorporates sustainability?

The IT Opportunity in Manufacturing

The biggest challenge right now is that there's no simple path. Sustainability requires a big-picture look (total system cost/benefit) across many small decisions supported by multiple applications, and where departments (P&Ls) may not all benefit. It's important to remember every decision will only be as good as the data behind it. As a repository of company data related to sustainability, as well as the means for developing what-if alternatives, IT is a critical component of a company's sustainability strategy. Table 1 walks one through the major IT technologies that will need to support sustainability initiatives.

TABLE 1 IT's Role in Manufacturer's Sustainability

IT Category	Support for Sustainability
Financial	Accounting of carbon credits, settlement
Reporting and Analytics	Providing a knowledge center of company policies and applicable regulations; performing performance measurements against company's sustainability metrics; aggregating data available in multiple sources
Environmental, health, and safety (EHS)	Monitoring and reporting for compliance and voluntary tracking
Procurement and supplier relationship management	Providing in-depth details on recycling-friendly materials, processes, or packaging, as well as supplier environmental scorecards
Product life-cycle management	Providing guidelines for design for compliance and the environment to understand and manage trade-offs in the product life cycle; designing green products
Returns processing	Providing documentation related to recycling and warranty replacement processes internally and at third-party service providers
Transportation management	Providing transportation evaluations based on impact to the environment, such as the trade-off between fuel consumption and arrival time and fleet optimization
Supply network optimization	Shifting from manufacturing-only emphasis of low-cost country sourcing to profitable proximity and bigger-picture look at transportation costs and manufacturing and distribution center locations
Manufacturing execution systems	Emphasizing production-line efficiencies, including energy efficiencies in conveying and sorting and a transition to fulfillment execution to manage operations
Enterprise asset management	Incorporating green criteria into optimizing assets, tracking energy consumption, adding alerts for preventative maintenance when energy use increases
Hardware management	Reducing power consumption in datacenters, virtualization, and the use of provisioning software

Source: Manufacturing Insights, 2008

Green Retailing

At the other end of the manufacturing supply chain are the retailers, who are also embarking on their own sustainability programs. One of largest factors contributing to a retailer's carbon footprint is the number of outlets it operates. An inefficient practice in one store replicates across thousands more, at least this is the case for the chain retailers. Take for example the opportunity for retailers to utilize power management practices on in-store systems (that are often never powered down). An average big box / mass chain outlet has 30 in-store systems that never power down, but are only in use 16 hours per day and at the other end of the format spectrum, small box retail chain stores average 3 POS systems that are always on operating for only 11 hours per day. One example of a small box retailer with 400 stores illustrates this point well - multiply the average of 3 units per store by 400 outlets to see that the retailer has 1200 units that are not in use for a good 113 hours per day. A power management practice cuts store IT electricity requirements by significant amounts.

In addition, perishable grocery retailers report that in-store refrigeration systems represent about 34% of the store's carbon footprint. Innovative retailers like Tesco's US based Fresh and Easy chain is testing high efficiency refrigeration that reduces the impact by more than 50%. Not only do these systems use energy more efficiently and leak less, but Tesco also recycles the heat generated by these devices.

Other sustainability programs that retailers are deploying touch upon energy usage, building construction, waste management, recycling and reuse programs, as well as programs that address employee travel and flexible employee work arrangements.

For example, Kohl's department stores approach is to maximize energy efficiency through the use of high efficiency cooling and heating systems, minimize waste through low flow toilets and recycling programs, deploy responsible building design by using recycled and local building materials, and reduce climate damaging emissions through the use of green power. The retailer uses IT to measure stores against LEED standards, measure energy consumption, and establish energy targets.

Wal-Mart is also taking steps to increase the energy efficiency of its own stores by 20% in seven years. New stores are on track to be 25-30% more efficient in three years. And its fleet is goaled to be 25% more efficient in three years.

Retailers' sustainability programs also measure supplier sustainability by evaluating their programs and goals, the carbon cost and waste in their packaging, and transportation costs. For example, Wal-Mart began using its packaging scorecard to rate suppliers on their progress toward developing sustainable packaging as one part of Wal-Mart's company initiative to achieve a 5% packaging reduction by 2013. As of the end of January 2008, more than 6,300 distinct vendors had entered 97,000 products into the scorecard, which evaluates the sustainability of product packaging based on metrics such as GHG emissions, product-to-package ratio, space utilization, innovation, the amount of renewable energy used in packaging production, and emissions related to the distance packaging materials are transported.

Staples ended an 11-year relationship with Asia Pulp & Paper Co. (APP) because of the supplier's "clear lack of progress in improving its environmental performance." APP runs one of Asia's largest pulp mills on the Indonesian island of Sumatra and has operations in China. APP had supplied Staples with more than 5% of its paper, but the company recently faced criticism from environmental groups. The World Wildlife Fund recently claimed APP's partners were responsible for the clearing of approximately 50,000 acres of natural forest rather than using wood from plantation trees. Recent data shows Indonesia is the world's third-largest emitter of carbon dioxide behind the United States and China, with fires that are set to clear natural forests and forested peat swamps after they have been logged being one of the major causes of carbon dioxide emissions.

Many retailers have already completed the 2008 Carbon Disclosure Project survey, which examines corporate greenhouse gas emissions management and other issues related to climate change. Some, like Lowe's and Big Lots, did this to avert having to answer to shareholder resolutions. Many retailers, regardless of initial motivations, find that once they complete an initial analysis of their energy usage and carbon footprint it would be irresponsible to not take action.

The IT Opportunity in Retail

Retailers usually focus on uptime and 24/7 availability for retail store systems, so the dialogue about shutting these systems down when they are not in use is surprisingly new. However, it is a welcome a-ha for retailers - the energy and cost savings that materialize with the use of power management systems are much appreciated. Retailers need to move beyond managing each platform and each system independently of each other – they need to be able to measure and manage energy consumption from a central management location. They need to be alerted when in store systems are consuming an inordinate amount of energy, perhaps signaling a performance problem. Measuring the enterprises carbon footprint needs to be a sustainable process – no pun intended – systems to collect, measure and manage all inputs will be required.

In the data center retailers are looking at virtualization, cooling, processor and data storage efficiency. In and outside of the store, technologies like transportation systems, refrigeration systems and DC conveyor systems can enable significant reductions in retail energy consumption.

Green Energy

The risks associated with climate change have already been felt by energy companies. For example, extreme weather conditions like storms, tornados and hurricanes have already impacted physical infrastructure. Energy companies are starting to consider the impact of rising seas on pipelines and power transmission cables. At the same time, all types of energy companies – refineries, power generators, gas distribution, electric transmission and distribution, upstream oil and gas, retail energy providers – are faced with the prospect of reducing their carbon footprint.

There are many strategies that energy companies can pursue. Strategies include:

- Investing in cleaner/renewable generation
- Promoting the development of fuel alternatives for transportation
- Helping customers decrease their use of energy through smart metering, in-home displays, and energy management systems for plants and offices
- Reducing the use of energy inputs by increasing plant efficiency

Take the case of generation. Generation plant emissions vary by fuel type, with coal-fired generation producing on average more than 1 ton carbon dioxide per MWh. This is particularly problematic in the United States where coal-fired generation makes up 49.7% of the generation when it comes to feedstock. According to the EIA, coal-fired generation in 2006 comprised 82% of carbon emissions produced by generation.

American Electric Power's, a coal-fired generation utility, approach to reducing its carbon footprint is through waste management and recycling, water and land management, energy efficiency for customers, and emission. The utility invested in new clean technology and carbon sequestration, has added renewables and nuclear power to improve the efficiency of its power plants, and purchases GHG offsets through forestry projects. Additionally, the utility is participating in voluntary carbon trading markets. To assist the utility in its GHG emission reducing activities, AEP is using software as a service, plus internal software for compliance and voluntary tracking, reporting, and

management. It uses sensors for managing plant efficiency. And it is embarking on smart metering and intelligent grid initiatives.

The initiatives expected to have the greatest impact on actual reductions of GHG are ones that set targets and establish a cap and trade market. Basically, a cap and trade market allows a market participant to buy or sell emissions credits, based on whether they are long or short on emissions. British Petroleum is one energy provider that embraced cap and trade. In 1997, British Petroleum (BP) set voluntary green house gas emissions to be reduced to 10% below 1990 levels by 2010. BP's approach was internal cap and trade system across 150 business units in 100 countries. BP invested in renewables, specifically solar, biofuels and hydrogen-powered bus fleets. BP is using environmental health and safety applications and Internet-based electronic market to aggregate decentralized knowledge and trade emission rights.

Other companies that own or operate power generation are addressing their carbon footprint in the following ways:

- Reducing emissions at existing plants via pollution control equipment, alternative fuels (substituting natural gas for oil), making plants more efficient.
- Developing or acquiring clean/renewable generation such as nuclear, hydro, wind, and solar.
- Investing in development of clean coal generation.
- Contributing to research and development for carbon sequestration.
- Acquiring carbon emissions credits through bilateral agreements or trading.
- Securing carbon offsets through investment in clean plants or forestation.

The IT Opportunity in Energy

The changing energy landscape will create new organizations that will be consumers of IT. They include: carbon registries, carbon trading exchanges, certifiers, verifiers, carbon sequestration services, wind generators, and offset providers/brokers. Table 2 highlights the IT areas that will be needed to support an energy's providers sustainability efforts.

TABLE 2 IT's Role in Energy Providers' Sustainability Efforts

IT Category	Support for Sustainability
Financial	Accounting of carbon credits, settlement carbon emission credits, offsets or renewable energy credits
Environmental health and safety application (EH&S)	Monitoring and reporting for compliance and corporate responsibility reporting including assembling data, calculating estimates where continuous emissions monitoring (CEM) is not available, managing compliance tasks and producing reports for regulators and/or climate change registries.
Energy Trading and Risk Management	Trading of carbon credits by refineries, carbon dominated generation portfolio and/or a "clean" generation fleet. Business process covers deal capture to settlement. Requires verification before trading and measurement against allowances; a challenge if done across multiple markets.
Analytics	Analytics for generation portfolio planning, for generation dispatch taking into account the feedstock, for increased efficiency of plant operations. For distribution, optimization of routing of service truck fleets.
Databases	Emissions and renewable certificate repositories, emissions allocations repositories
Carbon management services	Monitoring, verification, management, trading, risk management. Applies whether under an emission cap or a cap and trade system. Direct monitoring and verification by an independent entity is best case scenario.
Enterprise asset management	Incorporating green criteria into optimizing assets, tracking energy consumption, adding alerts for preventative maintenance when energy use increases
Supply network optimization	Managing supply chain for maintenance, repair and operations in this asset intensive industry. Closer proximity of suppliers, management of transport to reduce carbon footprint.
Smart metering/smart appliances, in-home displays and smart metering services	Smart metering – two way communications – along with in-home displays of energy consumption to help customers reduce their consumption/carbon footprint. Will come into play with "unbundling", energy efficiency incentives and dynamic pricing. Eventually, smart metering coupled with smart appliances will allow consumers to set comfort/price preferences and appliances to respond automatically. Expect smart metering services, especially communications services and meter asset management.
Intelligent grid	Lines losses occur as electricity is being transported. A more intelligent grid will reduce demand for generation, plus allow for the interconnection of cleaner/greener renewable energy sources like wind and solar and even plug-in hybrid vehicles.

Source: Energy Insights, 2008

In addition, if participants in carbon trading markets are allowed to use offsets against their carbon emissions, expect to see services to manage verification of offsets. Offsets such as reforestation will be supported by satellite imaging, geographic information systems (GIS), and global positioning systems (GPS), and forest credit services.

Green Financial Services

A wide range of green initiatives within financial institutions have emerged including the reduction of paper used in banking and insurance to the opening of green branch offices that reduce energy use, consume less water and use low-toxin building materials for better indoor air quality.

HSBC has invested over £100 million in activities designed to protect the environment to date, and is considered by many the leader in the industry in green efforts. Some actions HSBC has taken in its sustainability efforts include reducing energy consumption through initiatives such as video-conferencing technology and setting computers to turn-off automatically at night, buying green energy in many regions around the world, and measuring the distances traveled by employees for business purposes in order to estimate the carbon footprint from travel.

Vancouver City Savings Credit Union (Canada) with $14.1 billion in assets, 392,000 members, and 59 branches achieved carbon neutrality through a rigorous emissions reduction program focusing on energy use, staff travel, paper consumption, and waste.

A number of institutions are promoting the adoption of estatements and electronic bill pay in the name of conservation, which could be construed as a marketing-driven push that has environmental benefits. There is no doubt that the financial institutions that have converted customers to estatements and electronic bill pay have reduced the environmental impact of paper-based statements and checks. Not coincidentally, the cost to deliver an estatement is substantially lower than the cost to print and mail a paper statement.

Like retailers, banks are also incorporating green principles into their branches in order to reduce their overall carbon footprint. Wachovia Bank made a commitment to reduce its carbon dioxide emissions by 10% from 2005 levels by 2010. The bank has a plan to build at least 300 LEED (Leadership in Energy & Environmental Design) certified green financial centers by 2010. The 300 green financial centers will reduce energy use by at least 20%. The new buildings will consume 25% less water than traditionally built branches and will use low-toxin building materials for better indoor air quality. This institution has also adopted video conferencing to support its internal staff

and reduce staff travel. To keep people on the ground and more productive, each area of the bank contributed a portion of its travel budget to support the initial investment.

The sustainability efforts go beyond internal processes, into product development. Financial institutions have launched green credit card offers, green car insurance policies, carbon credit trading programs, green mutual funds and climate change indices.

North American credit card initiatives include Bank of America's Brighter Planet Visa, which uses a point system where every dollar spent earns a point and 1,000 points funds the purchase of one ton of carbon dioxide offsets. Wells Fargo has added rewards choices for its customers that fund renewable energy projects. In Canada, the Green Rewards card (expected to be launched in 4Q08) will credit consumers with points that can be redeemed on green transport products such as hybrid cars, bicycles, car-sharing memberships, or public transit passes. European green credit card initiatives include Rabobank's "Rabocard", with climate friendly donations based on purchases, and Barclaycard's "Breathe" card, which donates half of all card-related profits to carbon reduction projects around the world. In Asia/Pacific, HSBC Hong Kong recently launched a green Visa card with multiple green benefits, including a contribution by HSBC equivalent to 0.1% of every purchase value to the "HSBC Green Roof for Schools" program and rewards redemption for energy saving products and conservation causes.

With respect to green insurance products, there are a number of different ones within Europe. U.K. insurer BGL Group launched a 100% carbon-neutral motor insurance policy through its "ibuyeco" brand. The firm's sister company, Australian Insurance Holdings, also promotes a similar offering. Policyholders have a cost added to their premium based on the amount of carbon their vehicles emit each year (year, make, and model) and the kilometers driven. For every kilogram of carbon produced, policyholders pay for 1kg of carbon saved by a climate friendly project. Allianz launched ECOmotion, a climate-neutral car insurance policy designed to neutralize the annual carbon dioxide emissions of the insured vehicle. AXA France is offering a leasing-motor insurance product that combines the advantage of driving a small car with low GHG emissions during working periods, with a larger car for vacation periods/weekends.

HSBC has launched the HSBC Global Climate Change Index, which tracks the performance of 300 companies with climate change aligned products/services and also launched a Global Climate Change Fund to invest in this index.

Alongside the specific products and services offered by financial firms, an entirely new global financial market is in the early stages of development. A variety of exchanges that enable the buying and selling of emission-related credits or offsets have been launched, which help corporations achieve a climate-neutral footprint. Like other established financial markets, this market too includes financial derivative instruments (e.g., futures, options, and swaps). Ultimately, global liquidity for emission offsets will be improved once the various initiatives converge to create uniform market standards with respect to contracts and terms.

The IT Opportunity in Financial Services

As financial institutions move from paper-intensive business processes to a totally paperless environment, we expect to see the deployment of enterprise content management and workflow automation tools to re-engineer legacy, paper-based processes and to allow knowledge workers to focus more time on value added skills. Leading financial institutions are re-thinking "documents". With rich-internet applications and business rules, institutions can break the link between physical documents and the data held within them. By moving to data models and content fragments, institutions can improve control over the documents they present to clients, can ensure a much higher level of compliance, and can automate workflows.

Unified communications is another technology that can support green initiatives. Video conferencing in both customer-facing and internal applications such as Wachovia's can increase staff productivity and reduce the need for physical travel. In customer-facing use, video conferencing can reduce the need for specialists to travel to branches to answer client inquiries or close deals. This has the added value of improving customer service by responding to client needs immediately rather than based on the availability of specialists who must split their time

across many physical locations. Unified messaging is another unified communications technology that can support green efforts by reducing the delays in reaching employees who may be working remotely. With unified messaging, employees can be reached with a single address and the messaging application will route through to the employee based on the rules established. This allows institutions to reduce office space expansion without impairing productivity.

FinTech suppliers, especially the large multi-line vendors, such as Fiserv, Fidelity Information Services, Metavante, CSC, and others, could be engaged to calculate the vendor's ecofriendly footprint for the services used by the institutions. By benchmarking against peer institutions and developing approaches based on best in class examples they can provide guidance to their clients as they adopt green initiatives and prepare for future competitive and regulatory pressures to demonstrate carbon-conserving initiatives.

Essential Guidance

Actions to Consider

One of the most difficult challenges for companies is determining what to prioritize, what trade-offs to make. The following sections provide specific advice to manufactures, retailers, energy providers and financial institutions with respect to their sustainability initiatives.

For Manufacturers

Consider sustainability across our five basic categories: material selection, sourcing, resource consumption and emissions, end-of-life management, and fulfillment. Focus on the type of IT resources that can support their sustainability programs, such as manufacturing execution systems for the production stage, supply chain applications for the distribution stage, and product life-cycle management applications for the use and disposal stages.

For manufacturers that are just beginning to incorporate sustainability into their business operations, start by recognizing which life-cycle phase consumes the most electricity or produces the most GHG emissions. Focus on a deeper evaluation within that phase while taking the easy wins such as internal recycling programs and energy audits in the workplace, including the datacenter.

For Retailers

Sustainability programs involve evaluating resource usage across your enterprise. There are clearly financial benefits in identifying the most efficient utilization of IT resources – both at the data center and in each store. Identify near-term opportunities for cost reduction by starting with an evaluation of current consumption patterns. In the stores, consider the following energy efficiency changes:

- Implement POS system management.
- Implement automated power control management.

- Use alternative energy.
- Manage non-IT devices.
- Implement and manage high efficiency refrigeration and recycle heat output.
- Implement and manage high efficiency Cooling / HVAC systems and recycle heat output.

Consumers expect retailers to be socially responsible and they are increasingly spending their money on products and organizations that mirror their own commitment to a sustainable future. Consumers expect transparency and authenticity. Make real changes and demonstrate your successes. While forcing all consumers to bring their own shopping bag may be extreme, giving them the option and facilitating their ability to make socially responsible decisions is appreciated – giving them a couple of cents back is even better. Similarly, lowering the lights and using more efficient light bulbs sends a clear message to consumers that you are a retailer that cares. Big changes like LEED certification, solar or wind energy implementations and the purchase of renewable energy will demonstrate serious commitment to the cause and will make your "greenest" consumers more likely to choose your store to shop in. Tell the public about new practices that you have implemented or projects that you are working on. They might not notice that you have cut your IT energy requirements by 50%, but they will be impressed if you tell them – your investors will be even more impressed.

For Energy Providers

Research has shown that in order to reduce carbon below business as usual numerous approaches will come into play. For energy companies, energy efficiency for utility customers, carbon sequestration, increased refinery or generator efficiency and clean generation can be large contributors to reductions. Consumers, shareholders, regulators and credit agencies are all expecting energy companies to commit to carbon reductions. Energy Insights expects that soon carbon will come at a cost, whether through cap and trade or a carbon tax.

Start by understanding the contributors to the company's current carbon footprint. Use this measurement to establish a baseline to measure progress against reduction goals. There may be some strategies, such as greater plant efficiencies that will also reduce the costs of production. Make sure that there is role-based access to data, analytic tools and dashboards to support employees in achieving corporate goals and business unit objectives for carbon management and sustainability.

Europe has taken a lead on many strategies. The European Union Emissions Trading Scheme (EU ETS) has been in operation since 2005 and provides lessons in what to do and what not to do in the carbon trading market. Market participants in the EU ETS are becoming more sophisticated in using information technology to support emissions trading. In addition, companies such as Iberdrola in Spain have incorporated sustainability reporting into their quarterly financial reports. ENEL in Italy has undertaken installation of 33 million smart meters. However, there are smart metering initiatives in other regions of the world that have gone beyond pilot stage to large implementations of smart metering. Greenfield areas such as China are places to watch for the emergence of the intelligent grid. There is much to learn from these examples.

For Financial Institutions

Financial institutions should not pursue green products or investments in isolation or solely to support green talking points. Rather, institutions should establish integrated analytical review processes that examine both products and business processes for their impact on resource consumption. At its core, assessing the impact should be an internally driven effort designed to move an institution toward a more eco-friendly, sustainable, and profitable condition. A frequently cited standard for evaluating a green initiative is, 10 tons of emissions represent the estimated annual carbon footprint of a typical person. Broad application of this standard can have a comprehensive effect, not just a one-off appeal to a small segment of concerned customers. Applying this benchmark to all of the product-related processes, inputs, and outputs could well generate an enlightened analysis for management.

Each institution should examine its key customer segments to determine if educating these customer segments about their green risk is appropriate or if carbon neutrality can be incorporated into the customer value equation from the institution's perspective.

Institutions should consider how their key suppliers contribute to the efficacy of the institution's green initiatives. For example, credit card issuers could consider a PVC-free recycled plastic manufacturer as an alternative.

Investors will increasingly become aware of and sensitive to the environmental profile or impact of financial institutions and each institution's portfolio of customers. Avoiding the subject, or lagging the leading institutions, can lead to an unfavorable view from both institutional and retail investors.

Related Research

- *Energy Insights: Demand Response Aggregators: Boosting Program Participation*
- *Energy Insights: Spatially Enabling the Intelligent Grid, the Next Hollywood Blockbuster?*
- *Energy Insights: In-Home Display Units, an Evolving Market, Parts 1 and 2*
- *Energy Insights: European Offshore Wind: Poised for Growth?*
- *Energy Insights: Facing the Carbon Footprint: Apply Information Technology to Emissions Strategy*
- *Financial Insights: Can Financial Institutions Grow Green Products and Services?*
- *Financial Insights: How Green is Your Financial Institution's House?*
- *Global Retail Insights: IDC Green IT Forum: Real Reasons to Increase Sustainability on the Retailer Priority List*
- *Manufacturing Insights: Sustainability 1Q08 Update: Introduction and Going Green and IT's Role*
- *Manufacturing Insights: Making Sustainability Real*
- *Manufacturing Insights: Highlights from i2 Planet 2008, Phoenix: Where's the Green?*
- *Manufacturing Insights: Aravo Intends to Provide Supply Chain Visibility for Sustainability Efforts*

About Industry Insights

Industry Insights are a series of industry-focused business units that provide research-based advisory and consulting services for executives. Each Industry Insights company focuses on technology-enabled business innovation within a single industry. Industry Insights leverage 43 years of IDC research methodologies and processes yet they are agile start-ups with a global footprint.

Industry Insights research assesses the impact of IT investments on business processes by developing business cases, best practices, and benchmarking research to help executives to benchmark against peers and justify IT investments. In addition, Industry Insights provide research on emerging technologies to help executives drive technology-enabled business innovation.

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Complementary Webcast

Green Business: How Businesses are Reducing their Carbon Footprint and the Technologies they are Using

July 23, 2008*

1 PM EST

Panel Discussion

Moderator	Meredith Whalen, Group Vice President and General Manager IDC's Industry Insights
Panel Members	Jeanne Capachin, Research Vice President Financial Insights
	Jill Feblowitz, Practice Director Energy Insights
	Leslie Hand, Research Director Global Retail Insights
	Kimberly Knickle, Practice Director Manufacturing Insights

**Note: Slides and an audio recording will be available after the event.*

For additional information, please contact us directly at **info@energy-insights.com**