STATE OF GREEN BUSINESS 2010

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and the editors of

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Infographics by Seth Fields

Introduction

In this third annual edition of our State of Green Business report, we continue our efforts to measure the environmental impacts of the emerging green economy. This year's effort was colored by the Great Recession and its myriad of impacts on individuals, companies and governments around the world. Would the economic downturn nip the green economy in the bud?

Of course, 2009 also was a time of political transition in the United States, the principal arena of our focus. How would regime change affect companies' environmental policies, performance and progress? Would companies envision a new era of environmentally activist government? If so, would that compel them to become more proactive or to dig in their heels?

The answers aren't simple, and therein lies the foundation for the next 60 pages of this report. As in previous years, it shows a mixed bag of encouraging and discouraging news and trends.

On balance, however, we were pleasantly surprised by what we found. First and foremost, green business activity did not go away amid the harsh economic environment. It survived — and even thrived. In some cases, such as with energy efficiency, the recession provided a stimulus, as the need to cut operating costs in order to maintain competitiveness became ever more valued by executives, their boards and their shareholders.

Our quest for information gathering for this report isn't an end to itself. As in previous years, we try to provide context to the robust green business taking place and to help answer the question: Is all of this activity actually moving the needle? That is, did all of the hundreds of environmental announcements and achievements by companies during 2009 actually result in their doing better, environmentally speaking, than the year before?

Clues to the answers can be found in our annual GreenBiz Index, starting on page 21, in which we look at 20 measures of green-economy progress, from energy use to e-waste to employee commuting habits. In many cases, progress is evident, though not necessarily at the scale and speed needed to effectively address climate change, water shortages, resource scarcity and the toxicity of consumer products, among other pressing issues.

Definitive answers to our questions can be subjective, often in the eye of the beholder. We'll leave it up to you to decide for yourself whether all of this amounts to good news or bad or, more likely, something in between.

How will all this play out as the recession ebbs and the economy rumbles back to life? Will newfound efficiencies and sensibilities fall by the wayside, or have things indelibly changed?

How the green economy fares during the economic recovery will be the subject of another year's report. Hopefully, the next one.

— Joel Makower, Executive Editor, Greener World Media, Inc.

STATE OF GREEN BUSINESS 2010

Top Green Business Stories of 2009

"We're still here."

That may seem as fitting an epitaph as any for 2009, at least for most green business professionals.

It was a year that began with doom and gloom and ended on only a slightly more upbeat note. In between, the banks and the auto industry nearly collapsed, restaurants and retailers were shuttered, and those who managed to survive their employer's downsizing often received what is euphemistically called a "haircut" — a reduction in pay, a loss of benefits, involuntary time off, or all of the above.

Amid all this was something notable — something that made this economic downturn distinct from all the others we've seen over the past quarter century: Green professionals weren't among the first to be thrown overboard. True, their budgets were slashed, their headcounts frozen, all while their mandates sometimes increased. But they managed to survive, even thrive, during tough times. That's a sea change. And as the clock struck a new decade, many stood up, dusted themselves off, and exclaimed, sometimes with more than a little surprise: "We're still here."

Their survival is testament to how the greening of business has transformed in the past few years. What began as a seemingly altruistic endeavor, then shifted to a way to cut costs and improve reputation, has become a fundamental business competency, alongside accounting, finance, human resources, marketing, customer service, procurement, knowledge management and others. Indeed, in some firms, green thinking is becoming embedded in each of these other disciplines, increasingly woven into the corporate fabric. That has made green strategy and practices ever more valued, seen by top brass as a way to cut costs, improve operations, foster innovation, engage employees and satisfy customers — all critical during tough economic times.

The result was that for some companies, environmental improvements and innovations became a means of surviving lean times, and being more competitive once things rebound.

So much for the high-level view. How did all this play out during 2009? To make sense of the year just passed, we combed nearly 2,400 news stories, blog posts, opinion pieces, resource reviews and podcasts published during 2009 on our five websites — GreenBiz.com, ClimateBiz.com, GreenerBuildings.com, GreenerComputing.com and GreenerDesign.com — in search of trends and themes. Here are 10, in no particular order.

1. Radical Transparency Goes Mainstream

Green consumerism finally seems to be catching up to the Information Age. In recent months, a confluence of trends has brought more information about more products and companies to more people than ever before. Everyone from Washington to Walmart is demanding companies provide more information about the environmental (and health and social) impacts of what they do, and much of the information that results is being made public.

"Radical transparency" — referring to the virtuous circle that develops when detailed information about companies, products and ingredients is instantly

available, enabling consumers to make smarter choices, thereby moving markets toward less-harmful products — comes in many forms. Some of it is born of social networking, a new generation of blogs, widgets, websites and apps made available to the tweet-and-text generation. This includes websites like GoodGuide.com and HealthyStuff.org, along with their respective mobile applications that enable shoppers to get the sustainability backstory on products and companies while in the aisles.

But that's just the beginning. Detailed information about companies and products are coming from nonprofits, like the Interfaith Center on Corporate Responsibility and Climate Counts, both of which rate companies on their commitments and performance on climate change. It's coming from the mainstream media — Newsweek, for example — which is finding an avid readership for company ratings. It's also coming from the companies themselves — sometimes voluntarily, sometimes not. Over the past year, Apple, Clorox and SC Johnson all agreed to fully disclose product ingredients. Pressure to do this came from activists, Congress, even lawsuits.

And then there is Walmart. The retail giant placed a superstore-sized stake in the ground when it launched a Sustainability Index in 2009. The multi-phased project began with a questionnaire sent to thousands of its suppliers asking 15 questions in four categories: energy and climate, material efficiency, natural resources and "people and community." Though the questions were relatively simple and did not delve very deeply into suppliers' practices, its mere introduction sent both cheers and jeers through Walmart's stakeholder community, as nearly everyone tried to understand the initiative's impacts and implications.

The Sustainability Index is just the beginning. Walmart also announced an even more ambitious effort to create lifecycle-based standards for thousands of its products. To do that, it seed-funded a Sustainability Consortium, a group of academics and other experts charged with creating the metrics and, eventually, the standards by which products will be evaluated. The group has a monstrous task to do and it is unclear when its work will ever be seen on retail shelves. Even Walmart admitted that it was taking a long view of the project and that it found itself in uncharted territory: "Not only do we not have it all figured out, we don't want to have it all figured out right now, that's why we're working with all of you," as one Walmart executive explained to participants in a GreenBiz.com webcast.

There's more to come in the transparency arena, thanks to a new generation of environmental standard-setting and verification organizations that have launched new initiatives. They include established, name-brand players: Green Seal, which launched a company certification effort that aims to measure, verify and push for continuous improvement of a company's entire operations; the Good Housekeeping Institute, which launched a green version of its venerable Good Housekeeping Seal of Approval; and Underwriters Laboratories, the 115-year-old testing and certification icon whose "UL" logo is synonymous with product safety, which launched an environmental spin-off to provide independent green claims validation, product certification, standards development and other services. The U.S. Federal Trade Commission, which has been holding hearings

Green Seal, the Good Housekeeping Institute, and Underwriters Laboratories all launched major product- or company-rating initiatives during 2009.

on green marketing claims for more than two years, may eventually weigh in — or not.

Where all this is going remains to be seen — the websites, the activists, the voluntary disclosures, the Sustainability Index, the new ratings groups, the feds and all the rest. One thing remains clear: The amount of information about products and companies is about to grow exponentially. Whether all thes data lead to increased awareness or increased confusion on the part of consumers is an open question.

Four out of five people said they were still buying green products and services, even in the midst of the recession.

2. Green Marketing Gets Even Murkier

It stands to reason that during a recession — with high unemployment, job insecurity and a dramatic upswing in foreclosures and bankruptcies — shoppers would stick to basics: tried-and-true, affordable products. If so, that would be bad news for most green products, with their unfamiliar brands and often premium prices.

But you wouldn't know that from reading the polls. A succession of market research surveys during 2009 seemed gushingly optimistic about consumers' willingness to embrace green shopping. Example: Four out of five people said they were still buying green products and services, even in the midst of the recession, according to a study by Opinion Research Corp. Another found that shoppers from São Paolo to Shanghai were ready to shell out more cash for eco-friendly products, even as the recession ate into their buying power. Indeed, a handful of surveys even claimed that consumers were willing to pay more for green products.

What in the name of Al Gore is going on?

It's a complicated question, to be sure. Consumers, say the experts, are continuing to make green choices, but they're being pickier than ever about doing so. As a result, green marketing, always a challenging proposition, has become all the more challenging.

One thing seems clear: Premium pricing for green is a non-starter for most shoppers. That's expected when people are pinching pennies, euros and yen. And consumers' willingness to make green choices seems more likely when there's a personal benefit in addition to a planetary one. As such, there's a growing appetite for products that can cut utility bills, like energy-efficient appliances and light bulbs.

Even still, there remains a great chasm of ignorance — "radical transparency" notwithstanding — that's keeping consumers dazed and confused when they shop, and more than likely is tamping down interest in green purchases.

For example, one study found that while most consumers view "energy efficiency," "smart energy" and "energy conservation" as positive concepts, few fully understand what those and other energy-related terms actually mean. Another survey found more Americans buying energy-efficient light bulbs, but the majority remain in the dark about the federally mandated phaseout of incandescent bulbs that starts in two years.

Who Do Consumers Trust … and What Will They Buy?

The consumer marketplace has an appetite for more green products, but the demand for them is hemmed in by the roiling economy, according to the the Green Confidence Index, launched in mid-2009 by GreenBiz.com in partnership with Earthsense, an applied marketing company that measures U.S. consumers' attitudes and behaviors toward the environment and sustainability; and Survey Sampling International, the world's largest provider of survey research.

GREEN CONFIDENCE INDEX

The Index measures Americans' attitudes towards and confidence in how leaders and institutions are perceived to be addressing environmental issues, the adequacy of information available to them to make informed decisions and their past and future purchases of green products. Its three components include:

- **Responsibility:** Who's "doing enough" — and who's not — when it comes to the environment?
- **Information:** Is enough information available to make good, green choices in the marketplace, the job market and the voting booth?
- **Purchasing:** Is green purchasing continuing, accelerating, or declining?

Of the three components, Responsibility was the most volatile during 2009, and was the only one of the three that ended the year below the baseline of "100," set in July 2009.

The Index is available by subscription. To download a free sample copy, visit www.greenconfidenceindex.com.

And then there's the Snackwells Effect, named after the Nabisco cookies that are marketed as diet foods, being lower in fat or sugar than regular cookies. Studies found that people offset those low-cal benefits simply by eating more of the cookies — after all, they're "healthier," right? Similarly, studies have found that people lose 5 percent to 12 percent of the expected energy savings from efficient light bulbs because they leave them on longer, and 10 percent to 30 percent of the savings of efficient furnaces because they raise the thermostat. After all, they're more efficient, right?

All of this has made green marketing far more perplexing than most marketers bargained for, requiring more complex and nuanced messages and value propositions. In reality, the proposition is probably rather simple: Consumers want products that aren't just greener, but better — that offer some kind of personal benefit, whether they're cheaper to buy or own, have enhanced features or higher performance, are more convenient, less wasteful, healthier for their families, or simply cool.

Studies found that people lose up to 12 percent of the expected energy savings from efficient light bulbs because they leave them on longer — a phenomenon known as the "Snackwells Effect."

A collaborative founded by Nike, Best Buy and others is partnering with Creative Commons to allow creators of green innovations to share their intellectual property.

That message was driven home by analysts at GfK Roper, which for years has conducted regular "Green Gauge" consumer surveys. "What's interesting is that when you look at and compare some of the attitudes and behaviors in the U.S. to other developed markets, the U.S. is actually more like a developing market in terms of the way they think and behave green," Tim Kenyon, GfK Roper senior market analyst, told GreenBiz.com. "In a developing economy, there's much more of a personal self-interest involved in making green purchasing choices, and less emphasis on the greater good," similar to what Roper was seeing in the U.S.

American consumers, it seems, may have more in common with their counterparts in Chad, Chile and China than one might ever have imagined.

3. Green Innovation Becomes a Great Idea

The emerging green economy is about much more than green products and services. Behind them are countless materials, processes and technologies. And as the parade of progress marches inexorably forward, a growing number of innovations have a distinctly green tinge, significantly reducing material, chemical, water and energy inputs. Some of the innovations enable closed-loop or cradle-to-cradle products or processes, with little or no problematic waste or emissions.

This isn't exactly new. Such innovations have been coming forth for years, yielding process changes and improvements behind the scenes, things customers can't see and, as a result, that typically aren't marketed as "green." Aluminum beverage cans, for example, contain a roughly third less aluminum than they did a decade ago — a decidedly environmental improvement, given the environmental costs of mining bauxite and manufacturing aluminum — though the products contained in them don't boast about it. Many other innovations are even subtler: water-based glues and solvents that replace more toxic petroleum-based ones; plating systems that use a fraction of the chemicals and energy; biobased packaging materials that reduce volume and increase recycling; and thousands more.

Historically, most companies were left to invent their own "wheels," creating or finding such eco-innovations by themselves. But 2009 saw a new spirit of collaboration take hold. The Eco-Patent Commons — launched in 2008 by IBM, Nokia, Pitney-Bowes, Sony, the World Business Council on Sustainable Development and others to contribute environmental patents to the public domain — hit its stride last year. Among other things, the group added its 100th "IP-free" technology, meaning the innovations (a.k.a. "intellectual property" or IP) were openly available to all participants.

Meanwhile, another technology-sharing group called GreenXchange launched with the goal of allowing companies to share intellectual property for green product design, packaging, manufacturing and other uses. Founded by Nike, Best Buy and other companies, the group is partnering with Creative Commons, a nonprofit that has designed licenses that allow creators of intellectual property to share their work. Its licenses are used by everyone from Wikipedia to the White House.

Green Buildings Rise in a Flat Economy

Green building activity sustained impressive growth during 2009, amid a brutal construction market that has decimated other segments of the construction marketplace, according to the *2009 Green Building Market & Impact Report* published by GreenerBuildings.com.

According to report author and GreenerBuildings.com executive editor Rob Watson, floor area registered and certified by the U.S. Green Building Council's LEED green building rating system in 2009 is estimated to grow by over 40 percent compared to last year's totals, for a cumulative total of over 7 billion square feet worldwide since the standard was launched in 2000.

Other findings:

• The estimate of reduced vehicle miles traveled (VMT) grew to 780 million VMT to date versus 400 million in 2008. By 2030, the annual gasoline savings are expected to equal current U.S. imports from the Middle East.

• Total water savings from LEED through 2009 is estimated at 15 billion gallons, comprising 0.5 percent of annual non-residential water use. By 2030, LEED results in nearly 1.3 trillion gallons of saved water, equivalent to 30 percent of current annual non-residential water use.

• Annual carbon dioxide savings from LEED buildings is approximately 2.9 million tons from energy efficiency and renewables, a figure that is expected to grow to 130 million tons per year by 2020 and almost 320 million tons annually by 2030.

• An average of at least 580,000 employees are currently enjoying improved indoor environments in LEED buildings at present, and the "green building workforce" is expected to approach 29 million by 2020 and almost 64 million by 2030. The productivity benefits from LEED buildings to date range from $230 to $450 million.

To download the free report, go to www.greenerbuildings.com/greenbuildingimpactreport.

By 2030, the annual gasoline savings from LEED-certified green buildings are expected to equal current U.S. imports from the Middle East.

And the Environmental Defense Fund launched an Innovation Exchange to encourage companies to share best practices related to energy, water, climate and a host of other issues. Like the others, it hopes to propagate technologies and best practices.

All of these utilize different models, but their goals are the same: to stimulate and accelerate green innovation, as companies dip into the pool of existing IP to leverage other companies' creativity and successes. And it offers up a new model of sharing, one that recognizes that what works in one sector can be applied, perhaps in an entirely different way, in another.

4. Greener Fleets Hit the Streets

The major package delivery companies have been trying to lap the others in a race to be seen as the green-fleet leader.

While individual car buyers stayed out of showrooms, pushing the world's automakers to the brink and beyond, corporate and institutional buyers proved a bright spot for the industry — a bright green spot, in fact. Fleet buyers ramped up their purchases of hybrid-electric, diesel, biodiesel, electric and other so-called alternative-fueled vehicles, from taxis to trucks. These buyers continued leadership role will be critical to electric-vehicle manufacturers' hopes of growing sales and lowering costs.

The company announcements arrived in bumper-to-bumper fashion: Coca-Cola Enterprises' hybrid-electric diesel delivery fleet would be the largest in North America. An all-hybrid taxi company in Phoenix, Arizona, joined similar fleets from San Francisco to Boston. Frito-Lay added 1,200 fuel-efficient Sprinter delivery vehicles to its fleet; they get 50 percent better fuel economy than conventional vehicles in the firm's fleet. And many others, from AT&T to Zipcar.

And then there were the package delivery folks, each of which is trying to lap the others in a race to be seen as the green leader. UPS has been focusing on its truck fleets for some time, and now boasts more than 1,800 alternative-fuel vehicles globally, including hydraulic, hybrid-electric delivery trucks. The U.S. government's Recovery Act helped the U.S. Postal Service swap 6,500 old vehicles with a mix of hybrids, flex-fuel and four-cylinder replacements. The one-for-one vehicle replacement, which cost USPS nothing, includes 900 hybrid, 1,000 flex-fuel and 4,600 four-cylinder vehicles. And FedEx increased its North America hybrid truck fleet by 50 percent, adding 92 additional retrofitted delivery trucks, which produce 96 percent fewer particulates and 75 percent fewer smog-causing emissions than standard delivery trucks.

Green vehicles are getting traction for a number of reasons. For one, they are helping large fleet owners meet their companies' greenhouse gas reduction goals; for some companies, fleets are among the biggest parts of their carbon footprint. Fleet management companies, to which big companies contract to purchase, maintain and operate large vehicle fleets, are using their buying power to bring down the price premiums of some green vehicles. And it's not just about what you drive, but how you drive it, that's making vehicles more efficient. For example, PHH Arval, one of the largest fleet managers in the U.S., began a GreenFleet program, which encompasses smart vehicle selection, driver education and better maintenance to help companies cut their fleet operating costs by an average of 7 percent a year.

Technology is helping, too. Telematics, for example, can be used to help customers trim service time, while hybridization will allow them to reduce their fleet greenhouse gas emissions and related fossil fuel use. Fuel selection is another opportunity for savings. And when you put them altogether, the savings can compound. Novo Nordisk, Poland Spring and Carrier are among companies demonstrating that driving less, selecting more efficient vehicles and choosing lower-carbon fuel sources are bedrock principles of greenhouse gas management. For example, Novo Nordisk was among the first major fleets to train its drivers on fuel-smart driving practices, such as avoiding aggressive driving and minimizing idling. This effort alone helped Novo Nordisk increase the fuel efficiency of its existing vehicle stock by nearly 3 percent.

Is the Green Economy Too Big to Fail?

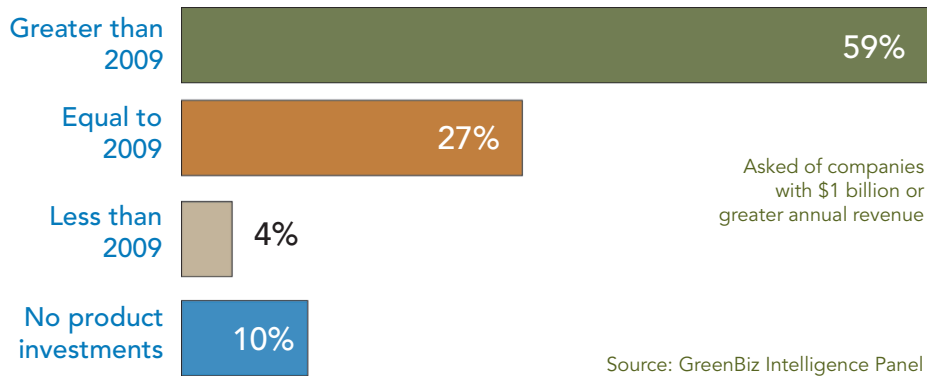
During 2009, unemployment rates reached double digits and the stock market plunged. Even venture capital investments in cleantech dropped. And yet, corporate investment in environment, health and safety (EHS) and in green product development continued a pattern of growth — two indicators that green may be recession-proof, at least for now.

Last year, we created the GreenBiz Intelligence Panel to take a monthly pulse of the green business world. Twice a year, we ask the 2,750-member panel for their views on key economic indicators. Our most recent survey, in January 2010, garnered 593 responses, nearly half from companies with revenues greater than $1 billion. We can now see clear trends by comparing those results with data from surveys conducted in late 2008 and mid 2009.

The indicators are all positive for the green economy, including EHS spending, employment, and green product development:

- Eighty-three percent said their 2010 EHS spending will be equal to or greater than 2009, with nearly half (43 percent) reporting an increase in spending. This represents a continuous increase since we began the survey. Significantly, only 6 percent are cutting spending, compared with 22 percent doing so six months ago.
- Hiring freezes are thawing. We saw a rise in the percentage of firms "with open requisitions for environmental- and sustainability-related positions" — from 18 percent in mid 2009 to 23 percent in early 2010.
- Investments in green product development continue to show growth, especially in companies with revenues greater than $1 billion. When these big companies were asked to identify their top environmental initiative, increasing investments in green product development (27 percent) narrowly overtook energy-efficiency investments (26 percent) for the first time since we began the survey. When asked about investment in green product development, 86 percent said it would be equal to or greater in 2010 than last year (27 percent and 59 percent respectively).

Will your green products and investments in green product development in 2010 be . . .



Source: GreenBiz Intelligence Panel

Eighty-six percent of large companies said their 2010 EHS spending will be equal to or greater than 2009, with 59 percent reporting an increase in spending.

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5. Energy Efficiency Gains Horsepower

Making data centers energy efficient has become an obsession for companies, especially tech firms that are finding that where to locate energy-guzzling data centers is becoming a choke point for their operations.

As managing greenhouse gas emissions continues to rise in priority inside companies, the need to find large, cost-effective energy savings is becoming increasingly important. Some of the biggest opportunities come from basic upgrades — of lighting, air conditioning, equipment, vehicles and other energy-using things. Coca-Cola Enterprises, for example, said it would slash its electricity consumption by 5.6 million kilowatt-hours a year as a result of an energy-efficiency overhaul of just its lighting systems at 24 facilities in the state.

But that barely illuminates the opportunity. There are equally large savings to be found from a wide range of energy-management practices.

Managing energy use has become increasingly easier, thanks to a new generation of technology. The latest energy management software, for example, is helping companies get real-time information about energy consumption, making real-time adjustments as needed along the way. Since the new tools allow companies to load the local utilities' rate schedules, they can see current energy consumption and cost by facility, minute, day, month or year. One company, Verdiem, unveiled a "Sustainability Dashboard" feature for its Surveyor PC power management program that helps tie the energy saved from smart PC fleet policies to reductions in energy use and greenhouse gas emissions. The feature enables IT administrators to quickly measure how PCs in any part of an enterprise are making use of energy-saving software. Another company, Engenuity Systems, said it was helping the McDonald's chain shave 13.6 percent off the $1.5 billion the fast-food giant spends each year on cooking, lighting, heating and cooling. Engenuity is installing devices to turn off lights at certain times of day and when buildings are empty, as well as air conditioning and heating equipment that monitors temperatures and controls.

All of this is spurring companies to adjust their greenhouse gas management strategies to highlight efficiency measures. Internet giant Yahoo!, for example, said it would no longer purchase carbon offsets for its operations, focusing its climate strategy on reducing the energy used by its data centers. The move reversed its 2007 announcement that it would invest in carbon-offset projects in order to become carbon neutral. Data centers account for more than half of the company's carbon footprint, including its global office operations, employee commuting and air travel.

Yahoo! wasn't alone. Making data centers energy efficient has become an obsession for companies, especially technology firms that are finding that where to locate energy-guzzling data centers is becoming a choke point for their operations. The facilities — which can consume as much energy as a small city — simply aren't feasible in areas where the electricity grid is stressed.

IT executives are upping their green game. A study conducted by AFCOM found an ever-increasing number of data center and facility managers (71.3 percent, to be precise) have already adopted at least some green IT projects. The Great Recession both helped and hindered this effort. While the economic downturn spurred interest in saving energy, AFCOM found the biggest obstacle to implementing IT efficiency projects was that there's not enough money to get

these projects started: 39 percent said budgets were too tight to purchase more efficient servers or cooling systems.

But energy savings — in data centers as elsewhere — doesn't necessarily mean new equipment. During a 2009 GreenBiz.com webcast, members of the Green Grid, an industry consortium, showed how good data center management practices could cut energy use by 20 percent.

That only begins to describe efficiency savings. An assessment of the "electric productivity" of the 50 U.S. states by the Rocky Mountain Institute found that shoring up performance gaps through energy efficiency could cut consumption by 30 percent. The RMI study determined the productivity rate of each state by measuring how much gross domestic product is generated for each kilowatt-hour consumed. It found that if the rest of the country achieved the normalized electric productivity of the top performing states, the country would save roughly 1.2 million gigawatt-hours annually, about 30 percent of U.S. electricity use, or 62 percent of its coal-fired electrical output. That's a lot of power to effect change.

6. IT Aims to Save the World

Information technology's seemingly unquenchable thirst for energy has been well established. But when you add up all of information and communication technology's energy footprint — the increasing need for computational power, data storage and communications — it amounts to about 2 percent of global greenhouse gas emissions, growing to 3 percent by 2020, according to McKinsey & Co. That's non-trivial, of course, but there's a countervailing force to consider: the potential for information technology to make the world far more energy-efficient, and to address some of the world's other pressing environmental and social problems.

At least, that's the story some of the largest IT companies are telling. And they're backing it up with a seemingly impressive array of capabilities to make the world not just more efficient, but to make it better.

One way IT can have a big impact is by replacing carbon-intensive activities with much more efficient and less-energy-intensive technologies. Well-established examples include the use of telepresence and virtual meetings to replace conventional business travel (something that will become increasingly common as Cisco expands its TelePresence program and HP launches a desktop telepresence program) and using secure networks and virtual meeting technologies to allow employees to work remotely.

A host of companies large and small offered up software solutions in 2009 to help consumers and businesses monitor their energy use. Google and Microsoft, for example, each launched its own home energy solution — Google's PowerMeter and Microsoft's Hohm. Tririga launched a software line designed to help large organizations measure, manage and reduce greenhouse gas emissions in their real estate holdings. Energy management startup Hara Software entered the market with a software-as-a-service corporate application that enables companies to track their use of resources, energy efficiency and emissions systemwide — and take steps to reduce them. Webcor Builders, one

A host of companies large and small offered up software solutions in 2009 to help consumers and businesses monitor their energy use.

The vast majority of manufacturers do not have the software technology in place to manage their environmental footprints.

Select Green IT Headlines of 2008

Will Government Have to Step In to Make IT Green?

Simple Data Center Best Practices Can Cut Energy Use by 20 Percent

What's the Greenest Country for Your Next Data Center?

Microsoft: You Can't Get any Greener than Windows 7

Apple's Greenhouse Gas Reporting is a Welcome Step Forward

Green IT Degrees: Coming Soon to a School Near You

Green IT's New Frontier: "Power-Capping" the Data Center

Are E-Waste 'Offsets' the Next Big Thing?

What Green IT Can Learn from Walmart

The Dirty Truth About (Some) E-Waste Collections

Who's the Greenest IT Company? The Answer Might Surprise You

Why Green IT Will Slash IT Jobs

of the largest contractors in California, and Climate Earth, a greenhouse gas accounting firm, joined forces to develop a database of the greenhouse gas emissions embedded in construction materials to help design buildings with smaller carbon footprints.

Google, Tririga, Hara and the others are part of a much larger group of companies eyeing a largely untapped opportunity. According to a study by IFS North America, the vast majority of manufacturers do not have the software technology in place to manage their environmental footprints. The study revealed that almost half of manufacturers lacked the enterprise technology to manage their environmental footprint at all, and another 28 percent had only limited capabilities.

IT's salutary impact is not just about energy. For example, Microsoft is focusing on accelerating breakthrough solutions to environmental challenges. In one project, Microsoft research shows how specific groups of trees interact with one another and the environment and whether and how tree species will need to migrate in a warming climate. Research shows that a new generation of realistic forest computer modeling could greatly improve our understanding of how forests work, how tree species respond to deforestation, and how forests impact climate regulation and environmental change.

Perhaps no one has articulated the scope of the opportunity better than IBM, whose Smarter Planet campaign went into full gear in 2009. That campaign aims to showcase Big Blue's technology and competency in a wide range of fields — retail, buildings, healthcare, government, banking, education, food and more — including how it leverages IT solutions with consulting and other services.

During the year, IBM launched a Sustainable Supplier Information Management Consulting service to help companies collect supply chain data such as energy use, labor practices and greenhouse gas emissions; launched a line of services and research called Strategic Water Information Management to work with utilities, government agencies and businesses in managing water consumption; and implemented these and other solutions globally — managing everything from smart grids to urban congestion.

These aren't simply a matter of doing good things for the world — they're enormous business opportunities. If IBM and its IT brethren can successfully deploy their technologies to propagate breakthrough infrastructure solutions (while simultaneously reducing their own footprints), they'll be well placed to tap the many trillion-dollar markets that await them. Smarter, indeed.

7. Toxics Become a Strategic Issue

The toxicity of products and manufacturing processes has been a concern ever since Rachel Carson's landmark book *Silent Spring* was published 48 years ago. But a confluence of events and trends pushed toxics further into the public spotlight in 2009 — and pushed them further up the corporate ladder.

Among these are a series of reports about toxic ingredients in consumer products — everything from toys to water bottles to jewelry — coming from China and other global manufacturing hubs. The resulting media attention spurred legislators and regulators to press for more and stronger rules governing toxic ingredients, including efforts to prod companies toward greener alternatives.

In the U.S., state legislation that mandates lists of "chemicals of concern" is accelerating. In 2009, Minnesota enacted a comprehensive chemical management law requiring state officials to generate a list of chemicals of high concern and a list of priority chemicals in children's products. A year earlier, California enacted a framework for addressing chemicals of concern, evaluating alternatives and moving toward safer chemical products.

Retailers are stepping in, too. Walmart launched the GreenWERCS Chemical Screening Tool, intended to identify chemicals' potential environmental impacts and drive green chemistry innovation. The tool, which is also being used by Sears and Kmart, scores and weights chemical product characteristics, such as how long chemicals persist in the environment, whether they build up in living systems and whether they are linked to cancer, mutations and reproductive problems.

Pressure on companies comes from other fronts. During 2009, Johnson & Johnson was asked by a coalition of organizations to remove two chemicals, considered probable human carcinogens, from its baby shampoo and other personal care products. Greenpeace activists conducted guerilla theater at Hewlett-Packard headquarters, scaling a building and painting "Hazardous Products" (in nontoxic children's finger paint) on the roof. Canada announced it was looking to expand its ban on phthalates in kids' products to include more items, following on a similar ban enacted in the United States. The Canadian government also said it plans to ban four chemicals from cosmetics due to

Walmart launched a tool to help suppliers identify chemicals' potential environmental impacts and drive green chemistry innovation.

concerns for human health, and possibly restrict their use in other products. Meanwhile, Chicago became the first city in the U.S. to ban bisphenol A (BPA), a chemical found in hard plastics, infant formula containers, metal can liners and numerous other products. It followed news of the first state to ban BPA (Minnesota) and first county (Suffolk County, N.Y.) to do likewise.

Publicity about toxics in common consumer products catalyzed reactions from companies, which are making changes in product formulations even ahead of regulatory mandates.

These and other actions have catalyzed reactions from companies, which are making changes in product formulations even ahead of regulatory mandates. Apple and Sony Ericsson were among firms earning kudos for removing toxics from electronics. Sony Ericsson, for example, said its products would be 99.9 percent free of brominated flame retardants and will be 100 percent free of polyvinyl chloride by the end of 2009, and that it would develop full chemical inventories for all its product lines. Strong supplier partnerships, green design objectives and sharing best practices with government, NGOs and peers have allowed companies like Nike, HP and SC Johnson to weed out toxic materials from their products, according to one report.

Meanwhile, the search for alternatives to toxics has grown. Green chemistry has become center stage for some mainstream chemical companies. One, the Japanese firm Teijin, developed a wide-ranging restructuring plan to cut back on plastics development and boost its green chemistry operations. A new industry consortium, the Better Cotton Initiative, formed in 2009, a partnership of cotton producers, retailers, environmental groups and such brands as Adidas, Gap and Levi Strauss. It plans to develop standards complementary to other efforts, like organic and Fairtrade cotton, calling for phasing out pesticides.

8. Food Companies Put Their Supply Chains on the Menu

The sustainability of food hasn't traditionally been much of a mainstream consumer issue. Whatever concerns consumers had about the environmental impacts of bringing food to the table were eaten up by concerns over taste, price and nutrition, with some interest in pesticide residues and other safety-related matters. Overall, there hasn't been much of an appetite from mainstream consumers about food companies' sustainability practices.

But the agricultural and sourcing practices of Big Food have come under attack by activists. Moreover, some companies have seen that the supplies of raw materials — fish and seafood, in particular — are dwindling to the point that is threatening the financial sustainability of their operations. And like all industries, food processors have been under pressure to eliminate waste and inefficiency, and to reduce their greenhouse gas emissions.

The result — a gumbo of activist pressures and sourcing constraints, seasoned with consumer concern and efficiency demands — are driving food companies to make dramatic shifts in how they operate and what they produce. That's leading them to push their suppliers — often, a long and complex web of growers, producers, wholesalers, processors and marketers — to bring better environmental performance to the table.

One emerging trend is the re-localization of agriculture, in which supermarkets, restaurants and foodservice companies are catering to citizen interest in supporting local agriculture and food production, The Whole Foods chain began

a Local Producer Loan Program in 2006, which it ramped up in 2009. Safeway launched a campaign to highlight the amount of locally grown food it stocks in its produce departments. Its Locally Grown campaign aims to promote the company's partnerships with regional farmers. The buy-local trend was ordered up by the foodies inside San Francisco's City Hall, which adopted what may be the country's first county food policy that aims to improve access to healthy food while supporting local agriculture and reducing shipping-related greenhouse gas emissions.

Talk about local: Cities are beginning to view opportunities to foster urban agriculture, turning empty lots and un- or underutilized land into vegetable, herb and flower gardens. And rooftops: The notion of high-rise urban farms is being envisioned and served up by budding entrepreneurs who view opportunities to supply restaurants, farmer's markets and other venues with locally sourced produce, flowers, even fish.

Fish, as noted earlier, are experiencing a sea change, in large part because of the shortages of everything from salmon to sole. About 75 percent of the world's most commercially important fish stocks are overfished or fished at their biological limits, say experts. But aquaculture, a.k.a. fish farming — in which young fish are raised on fish meal or grain — can be environmentally problematic, too. So, activists are stepping up pressure on fish processors, restaurants and retailers to avoid unsustainably harvested fish. Greenpeace, which launched its first seafood sustainability scorecard in late 2008, took supermarket retailer Trader Joe's to task in 2009 for that retailer's last-place ranking, even creating a campaign website, www.traitorjoe.com. With such issues in view, the foodservice giant Sodexo committed to reel in only sustainable wild-caught fish by 2015.

9. Packaging Companies Rethink the Box

Packaging issues have been of concern ever since the advent of "green" as a business issue. Early efforts were to create packaging from recycled or recyclable materials, then to reduce or eliminate packaging altogether. Packaging from biodegradable materials has had several false starts, probably because few packaging actually degrade in landfills or anywhere else. A variety of newfangled materials have come to the fore, though few passed muster, in terms of meeting price and performance characteristics. In the end, most of these products were — well, sent packing.

At last, genuine packaging innovations appear to be in the bag. In 2009, a new generation of materials and products emerged with the intentions of being used in large quantities by big companies. Coca-Cola announced it developed a bottle made with 30 percent plant derivatives, intended for use initially for bottled waters. The company says the bioplastic container can be recycled through typical recycling systems without contaminating other plastics. Coke says it wants to make bottles with 100 percent plant materials eventually, and is eyeing wood chips, corn stover and wheat stalks as possible bottle materials.

There were other innovations. Dell started shipping two of its products padded with bamboo cushioning, a part of the company's broad plan to reduce its packaging while using more recyclable material. Amazon.com launched a private

The foodies inside San Francisco's City Hall adopted a policy that aims to improve access to healthy food while supporting local agriculture and reducing shipping-related emissions.

Sprint's introduction of greener packaging for its entire wireless accessory line will save roughly $2.1 million annually and avoid 647 tons of waste a year.

Select Green Product Design Headlines of 2008

EPA Calls for Chemical Law Reform, More Responsibility on Companies

Minnesota Sets First Statewide Bisphenol A Ban

Timberland Pledges to Clean Up Leather Supply Chain

Patagonia's Clothing Recycling Program: Lessons Learned, Challenges Ahead

Coca-Cola Puts HFC Vending Machines on Ice, Full Phaseout by 2015

Next Wave of TerraCycle Products Comes from Huggies, Kleenex Packaging

More Companies Introduce Stripped-Down Packaging for Amazon

Sony Ericsson Unveils Latest GreenHeart Phones

Eastman Earns Cradle to Cradle Certification for 10 Polymers

Sun Chips Plans Fully Compostable Chip Bag

Origins to Recycle Any Cosmetic Company's Packaging

Canon Unveils First Products Developed With Life Cycle Thinking

Perkins+Will Launches First Chemical Blacklist for Building Designers\

Billboards Switch From Paper and Paste to Recyclable Plastic

label brand called AmazonBasics, shipped in what it calls Frustration-Free Packaging: minimal, easy-to-open and recyclable. Kraft Foods UK introduced resealable plastic coffee packs for its Kenco brand that are 97 percent lighter than their glass counterparts and require 81 percent less energy to manufacture. Frito-Lay's Sun Chips were relaunched in packaging made with 33 percent polylactic acid, a corn-based biopolymer. Aramark introduced a reusable takeout food container for college cafeterias, which the company says can divert as many as 2 million disposables from landfills in a single school year. In a similar vein, a collaboration between packaging manufacturer Direct Pack and recycler Global PET has resulted in the Bottle Box, the first 100 percent post-consumer plastic take-out packaging. Foodservice product providers Solo Cup and StalkMarket Products each released compostable paper cups for use with hot liquids.

Of course, efforts to *reduce* packaging continue unabated. Sprint and Cadbury both downsized their packaging as part of an effort to save tons of steel, waste and millions of dollars. Sprint's introduction of greener packaging for its entire wireless accessory line will save the company roughly $2.1 million annually and avoid 647 tons of waste each year. Hormel announced a range of new projects it expects will cut its packaging needs by at least an additional 5.3 million pounds a year. Kellogg's began trials with new, shorter, cereal box packaging made with fewer materials and designed to take up less space.

And then there was TerraCycle, the upstart New Jersey company that keeps finding new uses for old packaging, transforming them into innovative products. In 2008, it started manufacturing backpacks out of CapriSun juice bags, a new twist on logo-branded products. Over the past year, a veritable supermarket of goods emanated from its Trenton headquarters, all made from used packaging: portable, foldable audio speakers made with Frito-Lay product wrappers; cell phone holders, laptop sleeves and messenger bags from used packaging from Snickers, Altoids, Big Red and other brands from Mars, Inc.; Yak Pak backpacks made from reused vinyl billboards; diaper bags, tote bags and other goods from the used plastic packaging of Huggies diapers, Scott toilet paper, Kleenex tissue and other Kimberly-Clark products. In reusing packaging waste, TerraCycle seems to have tapped into one of the few truly renewable resources.

10. Green Business and Cleantech Find Common Purpose

For most of the past decade, the worlds of clean technology and green business seemed like a Venn diagram that was yet to be — that is, two circles trying to overlap. The world of cleantech was seen as early-stage, comprised of VC-backed startups or garage-lab science projects that weren't ready for prime time, at least not at affordable prices. Green business activity was seen as too process-oriented, more about changing management practices and engaging suppliers, customers and employees than about embedding smart new technologies into business operations.

At last, the circles are overlapping, big time. Clean technology in its many forms is entering the marketplace — occasionally in the form of goods and services that are visible to consumers (think electric cars and solar panels), but more often embedded in materials, manufacturing systems, public infrastructure, information technology and industrial processes. Most of this is hidden from public view or knowledge, placing the much-anticipated green economy behind a curtain of business-to-business activity.

The convergence of green business and cleantech can be seen in the emergence of the so-called smart grid, the confluence of the electricity grid with information technology, vehicles, consumer products and the built environment. The smart grid embeds intelligence into the electricity infrastructure, enabling homes and businesses to lower their power use during peak demand; appliances and lighting to be controlled remotely; real-time pricing of energy; storage of electricity in electric-car batteries in a way that can be sold back to the grid if necessary; the integration of wind and solar energy into the grid; and many other things. The smart grid will eventually become visible to everyday consumers — in the form of electric car charging stations, for example — but much of it will remain behind the scenes, much like the technologies behind our cell phone or broadband infrastructure.

The opportunity is huge — 1,000 times as large as the Internet, according to one Cisco executive. That's a big (and vague) number, to be sure, but you can be sure it has at least nine zeroes behind it.

Which is why Cisco and nearly every other information technology company views the smart grid as an emerging cash cow. Cisco, for its part, is making the

Clean technology is entering the marketplace but mostly hidden from public view or knowledge, placing the much-anticipated green economy behind a curtain of business-to-business activity.

switches and routers that will help control all this information, much as it does for the Internet. IBM has already proven through a pilot test that it can cut energy use of homes and businesses by an average of 15 percent and as much as 40 percent in some homes. Siemens is expecting $8 billion in new orders for green technology due to government stimulus programs from around the world, much of it for smart-grid technology. In October, the federal government committed $3.4 billion to invest in smart-grid companies, which it hopes will unleash $4.1 billion more from the private sector.

Best Buy has aspirations to become consumers' go-to resource for e-vehicles, solar panels, and a myriad of gizmos designed to help households plug into the smart grid.

With all this money at stake, it's not just IT companies drawn to the confluence of green business and clean technology. In 2009, Wells Fargo launched a commercial banking group dedicated to supporting cleantech firms, following on the $600 million it committed to companies developing renewable energy technologies, energy and resource efficiency solutions and smart grid applications. Ford, and pretty much every other major auto company, tested vehicle-to-grid communications systems, which are expected to be widely deployed in coming years. Smart-grid technologies were visible along the miles of aisles of the 2009 Greenbuild expo, such as building automation systems that "talk" to the grid while they manage one or more facilities' energy use. Among them was appliance giant Whirlpool, which committed to having 1 million clothes dryers that can receive and transmit signals to the electricity grid hit the market by late 2011, and to have all of its electronically controlled appliances smart-grid compatible by 2015.

Finally, there's Best Buy. The retail purveyor of car stereos, camcorders and CD players plans to be a leader in bringing smart-grid technologies to the masses. The company has aspirations to become consumers' go-to resource for a range of green products and services, from e-vehicles to solar panels to a myriad of gizmos designed to help households plug into the smart grid in the coming years. It has designs not just on selling the products, but deploying technicians to help customers set them up in their homes and businesses. The company's thinking, along with its initial efforts, suggests that the mainstreaming of next-gen green products is within view.

Perhaps that's a more fitting epitaph for green business in 2009: Recession notwithstanding, next-gen green products, and the infrastructure needed to support them, continue to emerge relatively unabated, expanding opportunities for companies seeking to be part of the growing green economy.

The GreenBiz Index

In this third annual edition of the GreenBiz Index, we continue in our quest to measure a representative basket of indicators that tell us, in aggregate, the progress U.S. companies are (or aren't) making in 20 measures of environmental performance — from operational efficiency to reducing emissions to investments in clean technologies.

This year's Index includes two new Indicators (on green information technology and corporate greenhouse gas commitments), while two have gone away (on building energy efficiency and green jobs, for which the latest data was incomplete or unreliable). In a few cases, Indicators are measured differently this year than last, though the change is consistent — that is, we've "backcast" the methodology to ensure we were comparing data in a consistent way, year over year.

Much of this has to do with the vagaries of the world of environmental data. Data gathering and reporting by government comes and goes, due to funding, shifting politics, organizational shuffles and other reasons. Similarly, research companies and nonprofits that collect information a certain way for years may stop doing so or may change their methodologies, causing us to find reliable new sources.

For each of the 20 Indicators, we've attempted to go beyond the numbers to provide context, explaining why the Indicators did what they did, their historical underpinnings, and their likely short-term forecast. That context is particularly important in the current economy, where the recession and the stimulus have roiled some of the data, in both positive and negative ways.

This year's Index also includes select findings from a survey conducted of members of our GreenBiz Intelligence Panel, a group of more than 2,700 readers from companies of all sizes and sectors, that we poll monthly to gain insight and intelligence on a range of green business issues. You can learn more by going to www.greenbizintelligence.com.

In aggregate, the GreenBiz Index paints a portrait of a green economy — or at least a greener one — that is emerging, ever so slowly. The story it tells is one of incremental change — too incremental, in many cases, to result in meaningful progress in reducing the energy, water, materials, carbon and toxic intensity of the U.S. economy and, in the process, sufficiently lighten the private sector's environmental footprint.

We also offer our summary of each indicator via one of three icons, indicating whether companies are making progress ("swimming"), falling behind ("sinking"), or standing still ("treading").

SWIM TREAD SINK

We look forward to your comments about the Index.

STATE OF GREEN BUSINESS 2010

The GreenBiz Index 2010 — Summary

Topics	What We Measured	What We Found	Swim/ Tread/ Sink
Carbon Intensity	Emissions of greenhouse gases per unit of GDP	Showing improvement, but not quickly enough	
Carbon Transparency	Companies responding to Carbon Disclosure Project	Quantity of reporting rises, but quality lags	
Cleantech Investments	Venture capital investments in clean technology	Downward trend, but still going strong	
Clean-Energy Patents	Patents issued by U.S. Patent Office	Solar, wind, and hybrids fuel energy-innovation growth	
Corporate Reporting	Number of reports from S&P 500 companies	Disclosure improves, but most companies still staying mum	
Employee Commuting	Number of workers driving solo, carpooling or using mass transit	High fuel prices barely dent solo driving	
Employee Telecommuting	Number of U.S. telecommuter households	Telecommuters remain stuck in the slow lane	
Energy Efficiency	Energy use per unit of GDP	Drawing more productivity from less power	
Environmental Financial Impacts	Environmental damage costs as a percent of economic output	Companies' internal costs become evident	
E-waste	Percentage of recovered equipment	Recycling molehills out of mountains of waste	

SWIM TREAD SINK

STATE OF GREEN BUSINESS 2010

Topics	What We Measured	What We Found	Swim/ Tread/ Sink
Fleet Impacts	Estimated annual greenhouse gas emissions per vehicle	Impacts fell mostly because people drove less	
Green IT	Number of products certified under Energy Star and EPEAT	A growing pipeline of efficient, less-toxic products	
Green Office Space	LEED-certified commercial building space	One of the building industry's few bright spots	
Green Power Use	Renewable energy as a percentage of all electricity generation	Economy slows growth, but feds offer funding surge	
Greenhouse Gas Commitments	Number of companies with publicly reported reduction targets	Commitments improve, but most firms sit on sidelines	
Packaging Intensity	Materials used per unit of GDP	Doing more with less, but progress is slow	
Paper Use and Recycling	Paper use and recycling per unit of GDP	Lower paper use leads to higher recycling rate	
Toxic Emissions	Toxic releases per unit of GDP	Declining emissions heading in the right direction	
Toxics in Manufacturing	Emission per year of 20 bioaccumulative and toxic chemicals	Progress in some areas, but stalled overall	
Water Intensity	Amount of water used per unit of GDP	Ever more efficient in water use	

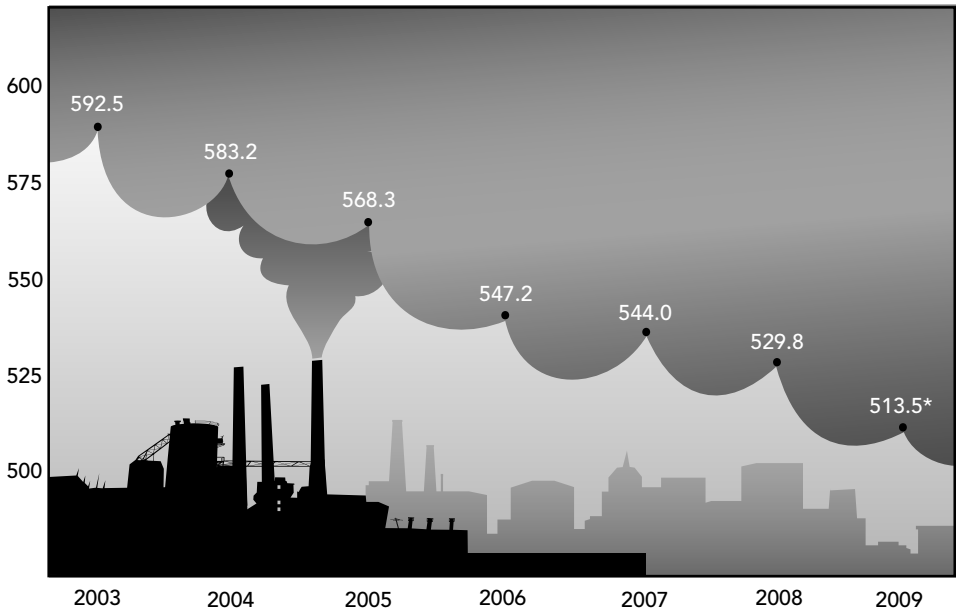
STATE OF GREEN BUSINESS 2010

Carbon Intensity

Slowly, Too Slowly, Dropping

Carbon Intensity

Million tons of CO_2 equivalent per million dollars of GDP*



*GreenBiz.com Research estimate based on emissions through Sept. 2009
Source: U.S. Energy Information Administration

Absolute greenhouse gas emissions have shrunk along with the momentum of the economy, dropping 2.2 percent in 2008 compared to 2007. When emissions are normalized against gross domestic product (GDP), U.S. greenhouse gas intensity decreased even more, by 2.6 percent in 2008, the last year for which we have full calendar year figures from the U.S. Energy Information Administration.

The drop in total emissions is due largely to a decline in energy-related carbon dioxide (CO_2) emissions, whose fall is attributed to several factors, including a drop in petroleum consumption in large part because of high gasoline prices and the economic slowdown. Fueling the drop was a reduced demand for electricity, which as a whole was less carbon intensive because of lower coal use and because the reduced demand meant energy utilities could keep their least-efficient generating plants idle. The 3 percent decline in total 2008 CO_2 emissions was the largest for the U.S. since 1990.

But while CO_2 emissions fell, other gases — methane, nitrous oxide and other gases with high global warming potential (GWP) — grew, but not enough to offset the drop in CO_2. The 2 percent increase in methane can be explained by changes in natural gas consumption, coal mining and livestock management. The boost in high-GWP gases was also caused by the substitution of these gases for ozone-depleting substances being phased out by international treaty.

56 percent of companies — including 85 percent with revenue over $1 billion — either have calculated their carbon footprint for Scope 1 and 2 emissions or are in the process of doing so.

— GreenBiz Intelligence Panel, December 2009

*All GDP data in this report is from the U.S. Department of Commerce's Bureau of Economic Analysis and is stated in 2005 chained dollars.

The 2008 data, however, leaves many questions unanswered because it stops short of 2009, when we suffered the brunt of the recession. In order to get a sense of how emissions fared in 2009, we used emissions and GDP data from the first three quarters of the year to forecast total emissions and greenhouse gas intensity. By our estimates, total greenhouse gas emissions fell by as much as 6 percent in 2009, leading to an overall drop in greenhouse gas intensity — emissions per unit of GDP — of 3 percent.

But many worry the downward trend will be short-lived as the economy picks up; and if the summer finds higher temperatures than the relatively mild 2009, electricity demand could increase energy use, increasing emissions. Even with increases in emissions during 2010 and 2011, however, the EIA predicts 2011 CO_2 emissions will still be lower than in any year between 1999 and 2008.

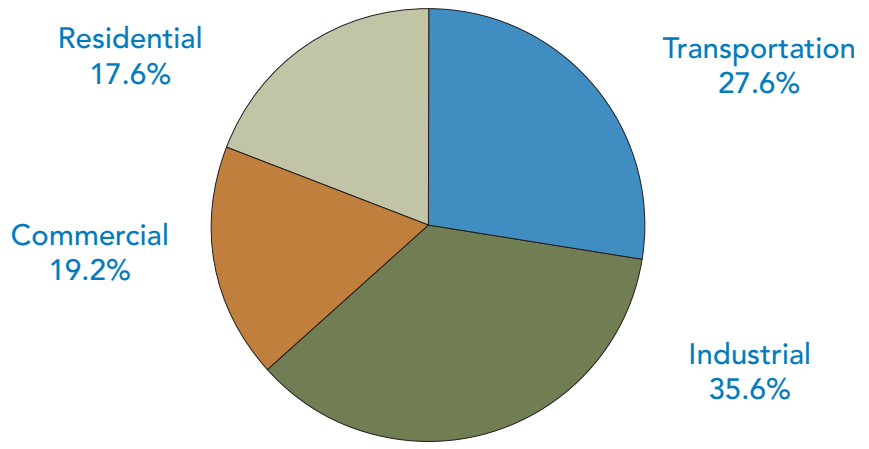
Worldwide, the International Energy Agency forecast energy-related CO_2 to drop 3 percent in 2009.

So, with all this progress, why have we ranked this Indicator as "sinking?" The fact is, the rate of progress is simply too small. Unless there are significant global policy shifts, current trends and country pledges will keep emissions on an upward trajectory through 2030, whereas scientists warn that emissions must peak around 2020 before declining up to 85 percent by 2050 to avoid catastrophic climate change.

The policies needed to get us to these emissions cuts have yet to be formulated, either in the U.S. or internationally. With Congress bogged down with health care reform and the Democrats on the defensive, it is unclear if and when this piece of President Obama's domestic agenda will be achieved. Without such legislation in place, the prospects for international agreement on greenhouse gas emissions will be dim, and progress in reducing those emissions will be postponed ever further away.

While CO_2 emissions fell, other gases — methane, nitrous oxide and other gases with high global warming potential — grew.

2008 Greenhouse Gas Emissions by Sector



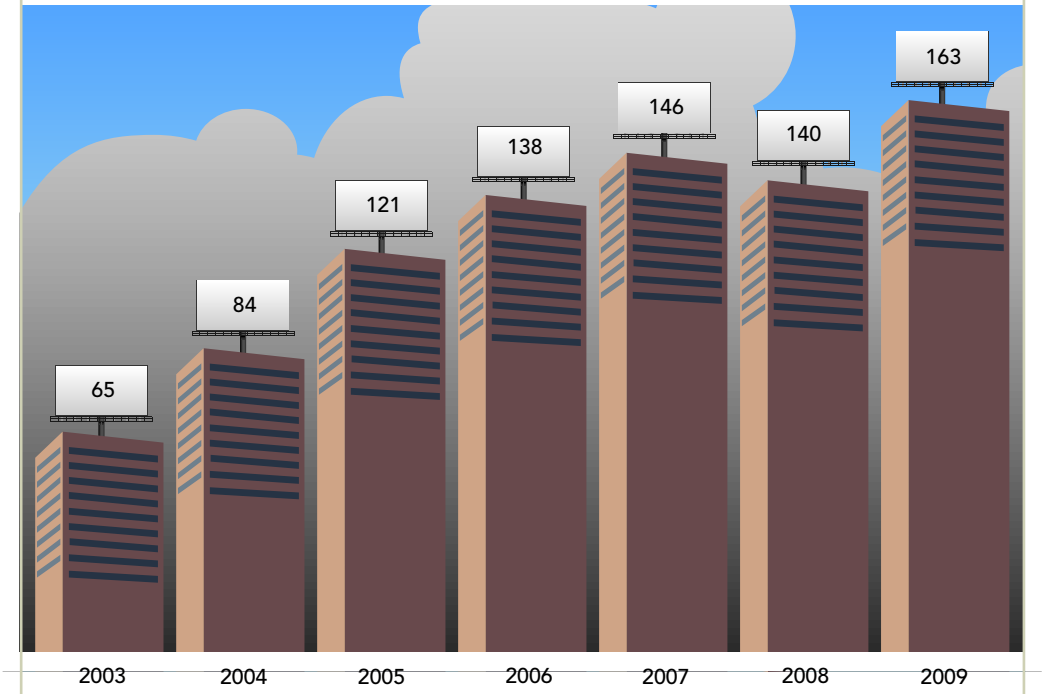
Source: U.S. Energy Information Administration

Carbon Transparency

Quantity of Reporting Rises, but Quality Lags

Carbon Reporting

Number of U.S. companies responding to Carbon Disclosure Project



Source: Carbon Disclosure Project

Regulatory activity at the national and global levels drove U.S. companies to reach new heights of climate change disclosure in 2009. Investors kept up the pressure, with a growing chorus calling for more information to help them weigh climate risks in their portfolios.

To shed light on corporate climate action and risk, the Carbon Disclosure Project (CDP) has surveyed the world's largest companies on behalf of institutional investors annually since 2003, rating the quality of those reports on a 100-point scale. CDP's seventh annual report examining FTSE Global 500 companies illustrated a trend that began several years ago: More big firms are responding to the survey and providing greater detail about the risks and opportunities they face from climate change.

Last year, 163 U.S. companies on the Global 500 Index responded to CDP's survey, a 16.4 percent increase over the previous year, when 140 companies responded. This means the percentage of U.S. responders on the Global 500 index inched up to 84 percent, from 82 percent last year.

Yet while the quantity of U.S. companies that recognize climate change as a business issue is growing, the *quality* of their reports isn't keeping pace: The average U.S. disclosure score was just 58 points out of 100, lower than most of Europe and other developed countries. A second performance score — which for the first time measured the level of climate action taken by companies in a given country — was even lower at 54 points out of 100, compared to top scorers The Netherlands, Finland and United Kingdom, which received 76, 74 and 66 points, respectively.

These scores will likely continue to rise for companies globally as their climate change analyses evolve. While firms often begin by measuring and reporting their direct impacts — so-called Scope 1 and 2 emissions, which are produced by the fossil fuels they burn and the energy they buy — they typically move on to more sophisticated measures, such as tallying indirect emissions, from commuting, air travel, waste disposal and purchased goods. The CDP has seen an uptick in the companies reporting indirect emissions. These so-called Scope 3 emissions reported by Global 500 companies increased 37 percent over 2008.

The spotlight on Scope 3 supply-chain emissions brightened in 2009, buoyed by Walmart's move to collect environmental impact data from its suppliers in order to eventually rate the sustainability of its products. Meanwhile, the CDP's Supply Chain Project expanded to help more than 40 companies evaluate and mitigate their supply-chain footprints.

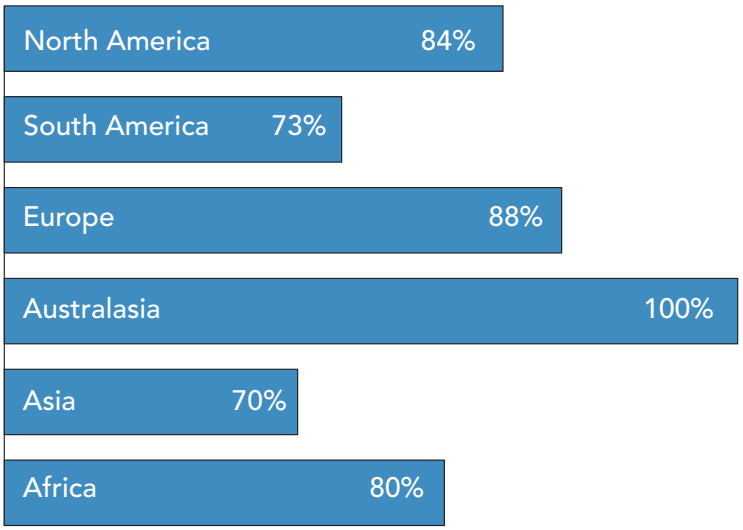
Although 2010 began without a federal U.S. climate law or legally binding international agreement, we don't expect regulatory action to subside on either front. Nations will continue working toward a global climate treaty, while a bill being drafted by the tripartisan trio of senators John Kerry (D-Mass.), Lindsey Graham (R-S.C.) and Joseph Lieberman (I-Conn.) could hold the key to bringing political interests on both sides of the aisle on board.

If that fails, the U.S. Environmental Protection Agency has already begun laying the foundation for regulation by introducing mandatory emissions reporting rules for carbon-intensive facilities, which began on January 1. And the U.S. Securities and Exchange Commission announced it would issue guidance to companies on how to disclose climate change risks, bringing consistency to the way public companies disclose this information to shareholders — and making nondisclosing companies more exposed to scrutiny.

If carbon legislation fails, the U.S. EPA has already begun laying the foundation for regulation by introducing mandatory emissions reporting rules for carbon-intensive facilities.

Global 500 Response Rates by Region, 2009

Percentage of FTSE Global 500 firms responding to CDP by region



Source: Carbon Disclosure Project

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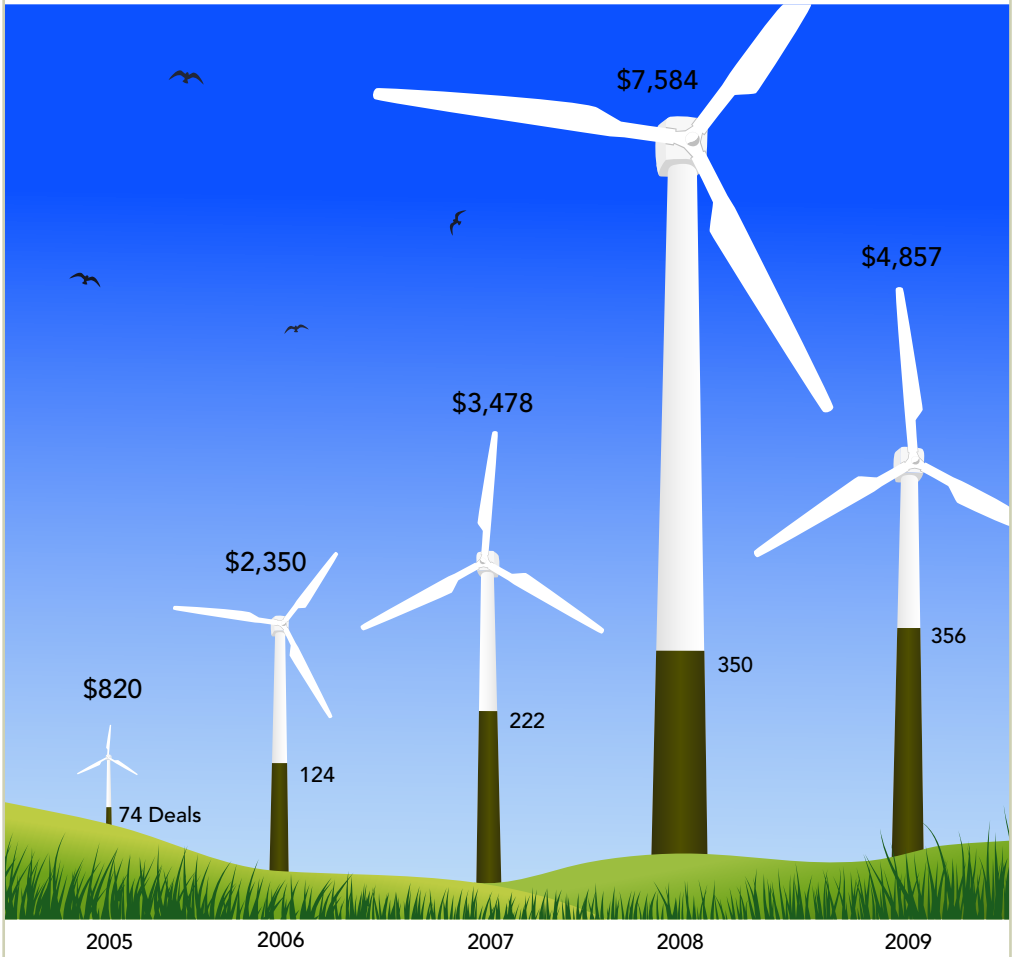
Cleantech Investments

One Step Forward, One Step Back

Investing in Cleantech

Venture capital investments, in billions of dollars



Source: Greentech Media

What goes up must come down — though not necessarily as far down as one might expect.

Venture capital (VC) investment in green technologies dropped in 2009 compared to 2008, according to Greentech Media. That was roundly expected. What was surprising was that the decline wasn't that severe. All told, VC investments dropped to about $4.8 billion, down almost 36 percent from 2008, but still nearly 40 percent above the 2007 level. That made 2009 the second highest year for cleantech VC investing. Cleantech investments kept on pace with overall VC investments, which dropped 37 percent during 2009, according to the MoneyTree Report from PricewaterhouseCoopers and the National Venture Capital Association. The number of deals increased, however, reflecting the still-robust nature of cleantech investing, albeit with fewer dollars per deal.

For cleantech, the 2009 story was one step forward, one step back.

While there was a wide range of technologies funded during the year, which is to be expected, the year's investment trends are notable by its winners and losers. The overall trend was sharply down, but some technology categories actually rose — and some dropped far more than others.

Examples of sectors on an upswing included automotive and transportation, which garnered 80 percent more VC investment in 2009 than in 2008. A related category — batteries, fuel cells and energy storage investments — was up about 24 percent from the previous year, in part due to the growth of battery technologies for the aforementioned vehicle sector. Other big winners were green buildings (up 357 percent) and green information technology (up 212 percent). These two categories are related, too, as they reflect the growth of green data centers, which blend green building technologies with energy-efficient IT equipment to dramatically reduce their energy use.

Categories seeing above-average drops in 2009 included solar, which was down 63 percent from 2008. That may be in part to the growing glut of companies in that sector — well over 100 VC-funded thin-film solar companies alone, plus many more making conventional cells, solar thermal or solar concentrating technologies. Beyond that, global solar sales took a sharp drop during 2009, no doubt clouding investors' appetites for funding yet more solar start-ups.

Other categories dropping include geothermal, which cooled 84 percent, and investments in energy-efficiency, demand-response, and smart-grid companies, which sagged 43 percent. That's surprising, given the boost to these technologies provided by the U.S. federal stimulus, though much of that funding has yet to be spent.

Investors anticipate an uptick during 2010 as the economy recovers. More important, 2010 should see a growth in initial public offerings (IPOs) for cleantech companies; already, several have announced their intention of going public this year. The relative lack so far of cleantech company "exits" — investor parlance for IPOs and acquisitions — has stymied cleantech investing for years. A rash of exits will no doubt lead to a rash of entrants — new investors wanting to stake their claim in the green economy.

2010 should see a growth in initial public offerings for cleantech companies; already, several firms have announced their intention of going public this year.

Cleantech VC Investments, 2009
(millions)

Solar	$1,415	Green IT	$106
Biofuels	$975	Environmental Technology	$77
Automotive and Transportation	$553	Green Finance Project Development	$59
Batteries, Fuel Cells and Energy Storage	$455	Miscellaneous	$57
Energy Efficiency, Demand Response and Smart Grid	$401	Geothermal	$35
Green Buildings	$143	Carbon Markets	$26
Wind	$142	Tidal	$22
Green Materials	$131	Nuclear	$9
Water	$130	Green Consumer Products	$3
Lighting	$115	**TOTAL**	$4,854

Source: Greentech Media

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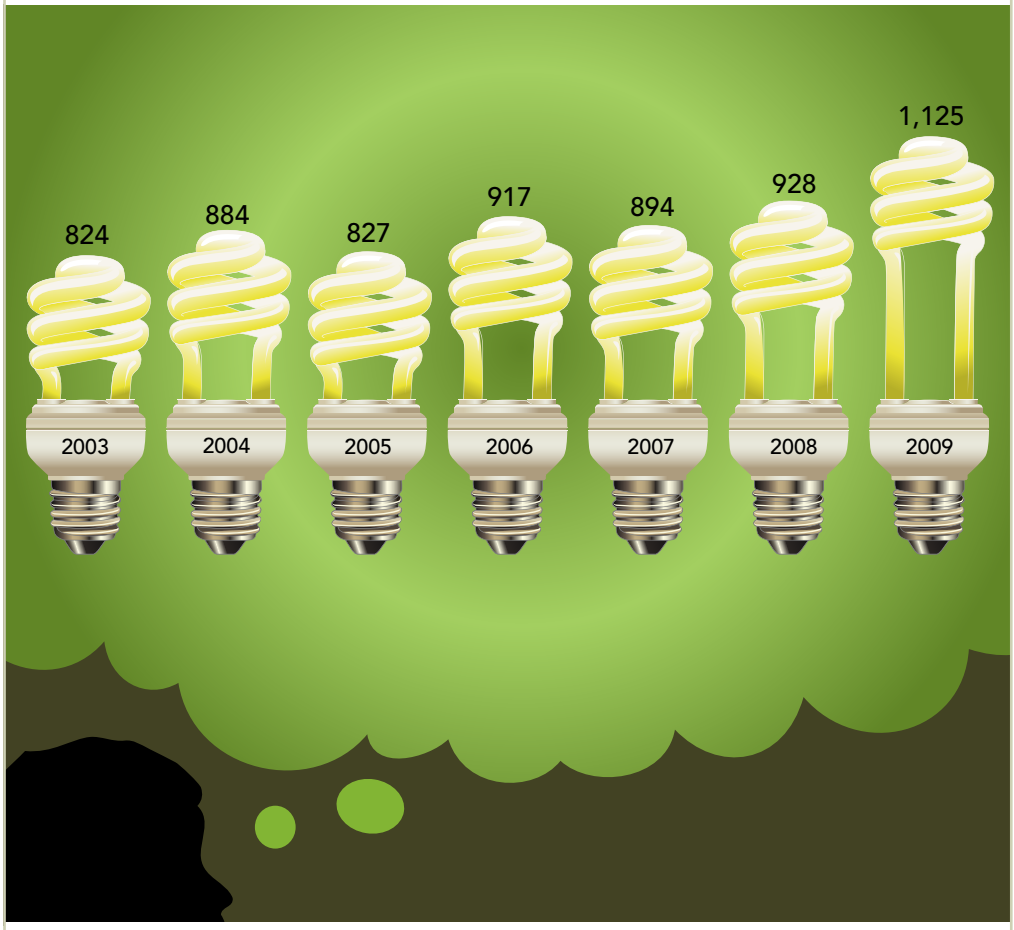
Clean-Energy Patents

Solar, Wind, and Hybrids Fuel Energy-Innovation Growth

Clean-Energy Patents

Number of U.S. patents issued, 2003-20009



Source: Heslin Rothenberg Farley & Mesiti, Clean Tech Group

U.S. patents for clean-energy technologies in 2009 were at an all-time high, with 200 more patents filed than in 2008, according to the Clean Energy Patent Growth Index, compiled by the intellectual-property law firm Heslin Rothenberg Farley & Mesiti. Patents in fuel cells and hybrid/electric vehicles were each up more than 20 percent over 2008, with solar patents up 60 percent and biomass/biofuel energy patents up 260 percent. Fuel cells, wind and biomass/biofuel energy patents were also at all-time highs in 2009. In contrast, hydroelectric and tidal patents decreased in 2009 while geothermal patents were up only slightly.

The rise continued a trend we've been seeing for several years — one that isn't likely to ebb any time soon. Clean technology in general, and clean energy in particular, is one of the hottest parts of both the energy and investing arenas.

Fuel cell patents continued to dwarf the other components of the Clean Energy Patent Growth Index in 2009, with more than four times the number of patents of nearest competitors wind and solar. (Some of that has to do with the complexity of fuel cells, but also to the many types and technologies in the works — for laptops, phones, cars and backup power for buildings, among

others.) In 2009, solar patents returned to levels last seen in 2003 and were barely edged out by wind patents for second in the clean-energy patent standings. Wind patents finally showed signs of calming after seven years of big increases. In contrast, solar energy patents appear poised to blow past wind patents to garner the number-two spot. Patents in hybrid/electric vehicles returned to historic levels, climbing to meet the rates for 2006 and 2007 after falling in 2008. Biomass/biofuel patents grew at a torrid pace. Research shows a large volume of applications in the pipeline, foretelling future growth in this area.

The top clean-energy patent holders in 2009 were dominated by automobile companies, which occupied five of the top 10 spots. Honda led and GM came in second, despite its well-publicized financial troubles during 2009, while Toyota closely followed, almost doubling its own total from 2008. GE continued its strong showing in clean-energy patents, having more than twice the patents of its nearest wind-patent competitor, Aloys Wobben, owner of Germany's Enercon GmbH. Samsung beat out the other non-automotive fuel cell patents holders, with Panasonic and Toshiba not far behind. Meanwhile, longtime fuel cell patent owners UTC Power Corp., Plug Power and Ballard lagged. Canon, far and away the solar photovoltaic patent leader, missed the top 10 and was the only solar patent holder even close.

Expect to see continued growth in cleantech patents in the next few years, as the federal economic stimulus, with its billions for cleantech R&D, bears fruit in the form of yet more innovations, says Victor A. Cardona, intellectual property law attorney at Heslin Rothenberg. But, he adds, "We're seeing a lot in the pipeline regardless of the stimulus, and that's just going to add to it. There are a lot of people working in cleantech and renewable energy that weren't a year ago."

U.S. patents for clean-energy technologies in 2009 were at an all time high, with 200 more patents filed than in 2008.

Clean-Energy Patents, by Type

	Wind	Solar	Hybrid or Electric Vehicle	Fuel Cell	Hydro-electric	Tide or Wave	Geo-thermal	Biomass/ Biofuels	Other	Total*
2002	42	162	144	349	6	9	2	12	9	723
2003	49	156	122	464	5	11	5	24	3	824
2004	72	124	98	551	8	18	8	16	4	884
2005	92	104	101	501	7	11	6	14	3	827
2006	109	95	105	572	8	18	5	13	5	917
2007	133	100	105	517	4	15	4	28	2	894
2008	155	95	86	530	10	34	9	19	9	928
2009	156	155	105	634	3	26	10	49	2	1,125

Source: Heslin Rothenberg Farley & Mesiti, Clean Tech Group

* Row totals may be less than the sum of the row because a small number of patents fall into more than one category

Corporate Reporting

More Accounting for Non-Financial Impacts

Corporate Social Responsibility Reports
Number of reports filed by S&P 500 companies

Source: CorporateRegister.com

Some speculated that the reporting of environmental and social matters would be among the casualties of the economic downturn as the budgets of companies both large and small were cut and companies got "back to basics." But the financial crisis created more pressure from stakeholders, customers and investors for companies to increase transparency and close the non-financial information disclosure gap.

In response, the number of large U.S. companies reporting their social and environmental efforts for the first time grew in 2009. Nearly 40 percent of firms on the Standard & Poor's 500 index filed non-financial reports last year, a one-third jump over 2008. Since 2004, the number of S&P 500 reporters has more than doubled.

This extends the trend in the right direction but doesn't yet erase a historical gap between U.S. companies and their European counterparts, according to CorporateRegister.com, a U.K.-based firm that tracks non-financial disclosures. For the second consecutive year, the company drew upon its database of global corporate social responsibility (CSR) reports to help us assess the performance of S&P 500 companies.

Although these non-financial reports go by many names, as recently as two years ago the content of reports filed by S&P 500 companies were nearly evenly divided between "corporate responsibility" and "sustainability," which also include economic or socioeconomic information. In comparison, nearly 60 percent of S&P 500 companies chose to file "corporate responsibility" reports

31 percent of companies have no plans to publish a corporate social responsibility or sustainability report, including 11 percent of companies with revenue over $1 billion.

— GreenBiz Intelligence Panel, December 2009

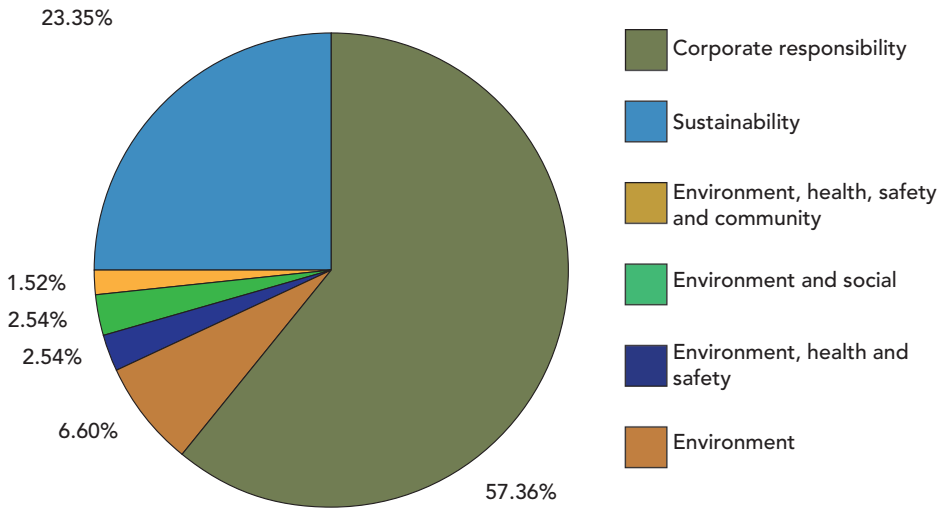
in 2009, while nearly a quarter opted for "sustainability" reports, in a trend that also is playing out globally.

We found that large U.S. companies are ahead of the curve in some ways: Roughly 41 percent of the U.S.-based S&P 500 reporters in 2009 followed the Global Reporting Initiative (GRI) framework, a standardized method of measuring environmental and social performance. Although this is lower than the 46 percent of GRI-compliant reporters last year, it still matches the European rate, outpaces the 2009 global average of 38 percent and outperforms the overall average of 32 percent for all 426 U.S. companies that filed reports in 2009 (not all of them were on the S&P 500 list).

Just 6 percent of S&P 500 reporters, however, included in their reports adoption of the United Nations Global Compact Index, a set of 10 principles related to anti-corruption, human rights, environmental stewardship and labor. That's relatively unchanged from last year. Third-party verification of reporting data is another area worth noting: Only 7.6 percent of S&P 500 reporters, including big-name companies such as 3M, General Electric and Starbucks, chose to have their social and environmental disclosures backed up by a third party. This rate significantly lags the global average of 23 percent and the European rate of 30 percent.

"U.S. companies are inordinately coy about publishing non-financial information which is not already in the public domain, and even more coy about subjecting it to third-party scrutiny," CorporateRegister.com's Paul Scott told us. "Until some form of persuasion is brought to bear on U.S. reporters, whether via shareholder resolutions, legislation or public pressure, this trend seems set to continue. It has been static for years." It's unclear whether such persuasion is forthcoming.

S&P 500 Reports by Type, 2009



Source: CorporateRegister.com

The financial crisis created more pressure from stakeholders, customers and investors for companies to increase transparency and close the non-financial information disclosure gap.

CorporateRegister.com (www.corporateregister.com) is the global corporate responsibility (CR) resources website. It hosts the world's most comprehensive directory of CR and sustainability reports, profiling more than 24,000 reports worldwide. With an archive stretching back to 1990, it is indispensable for anyone working in the field of CR and sustainability reporting.

Working with some of the leading organizations in corporate responsibility, CorporateRegister.com hosts several official reporting registers. Further site features include a fully searchable directory of more than 6,000 organizations ("reporting partners") actively involved in CR reporting.

CorporateRegister.com developed the world's first annual global online CR reporting awards, the CRRA — see www.reporting-awards.com.

More information:
info@corporateregister.com or
+44 20 7014 3366

STATE OF GREEN BUSINESS 2010

Employee Commuting

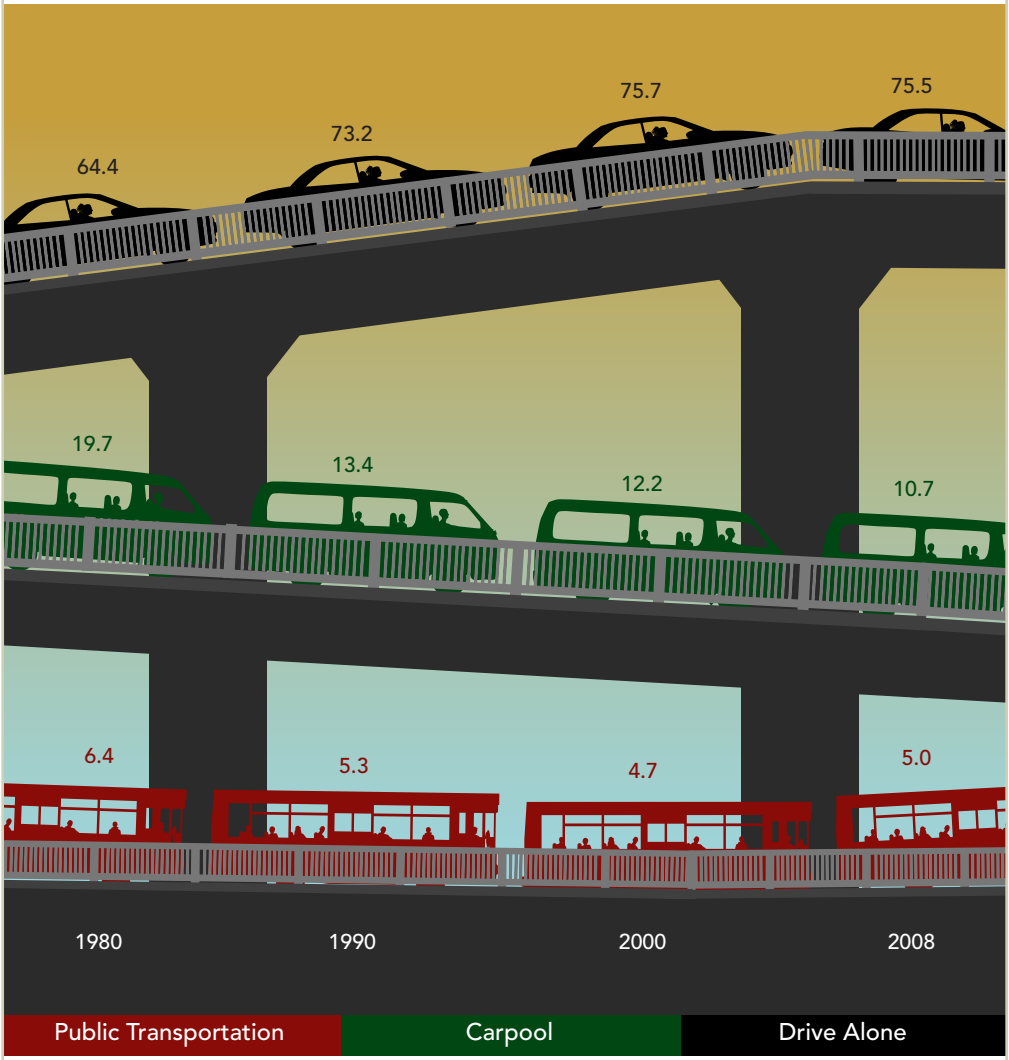
As Fuel Prices Drop, Commuters Stay in Their Cars

49 percent of employees report that they drive their own car to the office, as do 67 percent of those working for companies with revenue over $1 billion.

— GreenBiz Intelligence Panel, December 2009

How Americans Get to Work

Mode of commuting, by percentage



Source: U.S. Census Bureau and American Community Survey

Fuel prices and the economy held the most influence over employee commute patterns in 2009. Unfortunately, whatever gains the 2008 gas price spike created in shifting workers toward greener commutes have been complicated by the high unemployment of the Great Recession.

The average cost of regular unleaded gasoline in the U.S. hovered around $4 per gallon for 10 weeks in 2008. This period of high prices set alarm bells ringing and workers scrambling to find alternative means of getting to and from work. But overall, the percentage of solo drivers in the U.S. dipped only modestly, to 75.5 percent in 2008, the most recent year available, compared to 76.1 percent in 2007, according to data from the U.S. Census Bureau's annual American Community Survey.

Had gas prices remained high, the proportion of solo drivers would likely have been lower, but the economic downturn drove down fuel prices, causing many to snap back toward old driving habits.

Carpooling, typically influenced by economic conditions, barely budged to 10.7 percent from 10.4 percent in 2007, and has idled in this range for several years — a far cry from the highs of roughly 20 percent carpooling in the early 1980s.

The high fuel prices of 2008 also inspired many solo drivers to try out or rediscover public transit, particularly in smaller urban areas. According to early findings of the 2009 National Household Travel Survey, work-related transit use nearly doubled during the 2008 summer gas spike in regions with populations of less than 1 million. About two-thirds of transit trips were work-related during this period, compared to other times of the year when work accounted for slightly more than a third of transit trips. Male workers were more likely to try public transit than women.

As a whole, 5 percent of workers went to work by public transit in 2008, up from 4.7 percent a year earlier. What seems like a small gain translated into a modern ridership record: Americans took 10.7 billion public transit trips in 2008, a 4 percent increase over 2007.

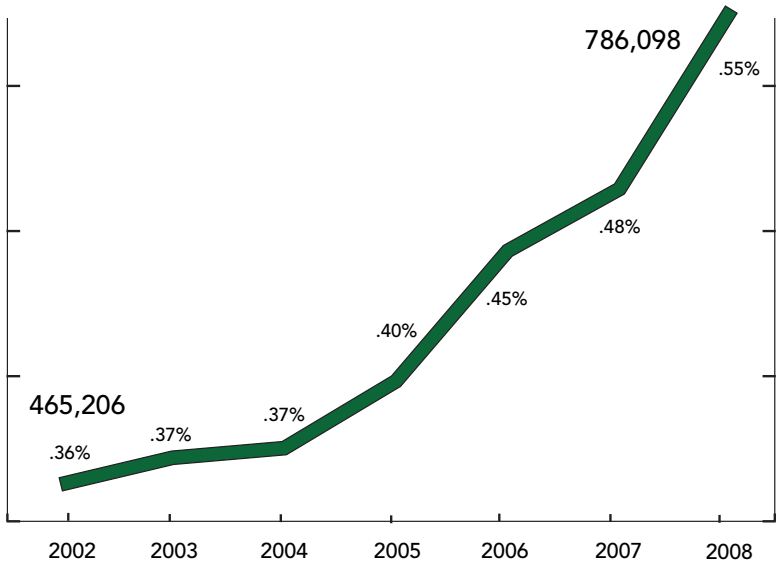
Effects of the recession — namely unemployment and lower gas prices — were in part blamed for a 3.8 percent drop in transit use for the first nine months of 2009, nearly canceling out the gains made the year before.

In the end, commuting patterns today look pretty much as they did in 2000, in part because there has been little change in overall employment, according to commuting expert Alan Pisarski. Over the last decade there has been zero net job growth, compared to the last seven decades, when job growth exceeded 20 percent. Additionally, unemployment and decimated housing prices have forced some to look further afield to find jobs, lengthening their commutes. All of which has contributed to a state of gridlock for employee commuting.

The high fuel prices of 2008 inspired many solo drivers to try out or rediscover public transit, particularly in smaller urban areas.

Wheel Life

Number and Percentage of U.S. Bike Commuters



Source: U.S. Census Bureau and American Community Survey

STATE OF GREEN BUSINESS 2010

Employee Telecommuting

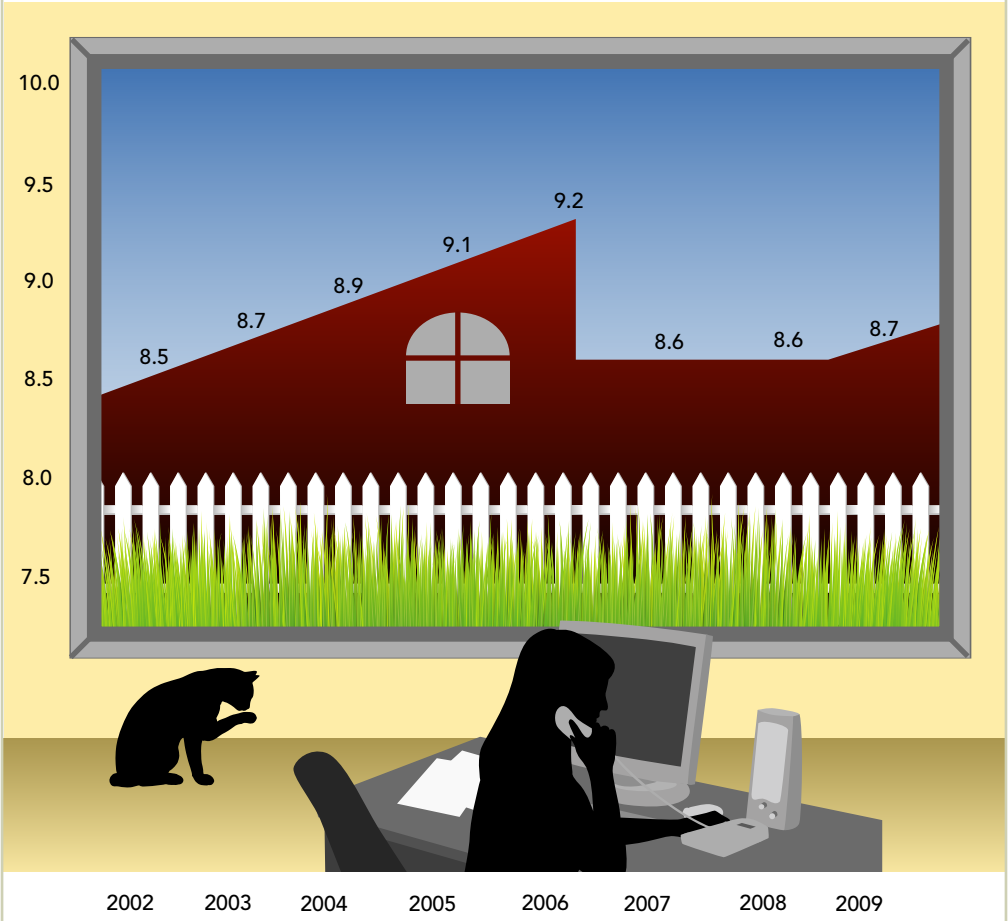
Stuck in the Slow Lane

54 percent of companies have programs to promote carpooling or telecommuting, as do 63 percent of companies with revenue over $1 billion.

— GreenBiz Intelligence Panel, December 2009

U.S. Telecommuters

Millions of telecommuter households



Source: IDC

Telecommuting allows millions of Americans to put in a day's work in the comfort of their homes (or coffeehouses), avoiding commutes and the distractions of the workplace in an arrangement that both saves money and improves employees' productivity and work-life balance.

Telecommuting trends often mirror — or even precede — economic fluctuations, proving to be a leading indicator of economic health, according to the research firm IDC. The company's definition of telecommuter is an employee who works from home more than three days per week as part of an arrangement with his or her employer, but others measure the practice in different ways. Some define "teleworkers," for instance, as those who work from home just one or more days per month, which expands the population to a much large number.

According to IDC, telecommuting rates held steady in 2007 and 2008 at 8.6 million, as companies eased support for alternative work programs and workers returned to their home offices in greater numbers. "With the net decrease of roughly 600,000 telecommuters in 2007, one might have seen the current economic storm looming before it actually hit in the fall of 2008," notes IDC Senior Analyst Justin Jaffe. Similarly, the decline of 600,000 telecommuters

between 2002 and 2003 mirrored the value of the Standard & Poor's and Dow Jones indices, which dropped by nearly a third.

So, the good news for the economy is that the number of telecommuters grew modestly to 8.7 million in 2009. IDC expects this figure to grow incrementally over the next few years, reaching 9.6 million by late 2013.

Telecommuting pays off dividends for companies like Sun Microsystems, whose long-running Open Work Program saved the company nearly $70 million in real estate costs in 2007. Cisco estimates productivity gains from its telecommuting workforce generate $277 million in savings a year. That's largely due to the fact that Cisco workers spend roughly 60 percent of the time saved by telecommuting on work. In 2008, telecommuting at Cisco avoided the generation of 47,320 metric tons of greenhouse gas emissions. (It should be noted that Cisco is a leading manufacturer of telepresence remote-meeting equipment used by telecommuters.)

The federal government, which took steps in 2009 to increase the number of federal telecommuters through standardized policies and additional training, has taken steps to sweeten corporate telecommuting with tax breaks for letting workers telecommute. The Telework Tax Incentive Act recently introduced in Congress would give individual teleworkers an annual tax credit of up to $1,000.

Meanwhile, states have moved in recent years to reward employers for letting their workers telecommute. Georgia, for example, gives companies up to $20,000 in tax credits to offset the costs of a telework program, while Oregon offers a credit to help fund telecommuting initiatives and other green business programs, including renewable energy and energy efficiency projects.

For now, the economy could have a perverse effect on telecommuters, who may feel the need to travel to the office more often to get plenty of "face time" with their bosses for the sake of sustainability — that is, of their jobs.

Telecommuting trends often mirror — or even precede — economic fluctuations, proving to be a leading indicator of economic health.

10 Large Telecommuting Firms

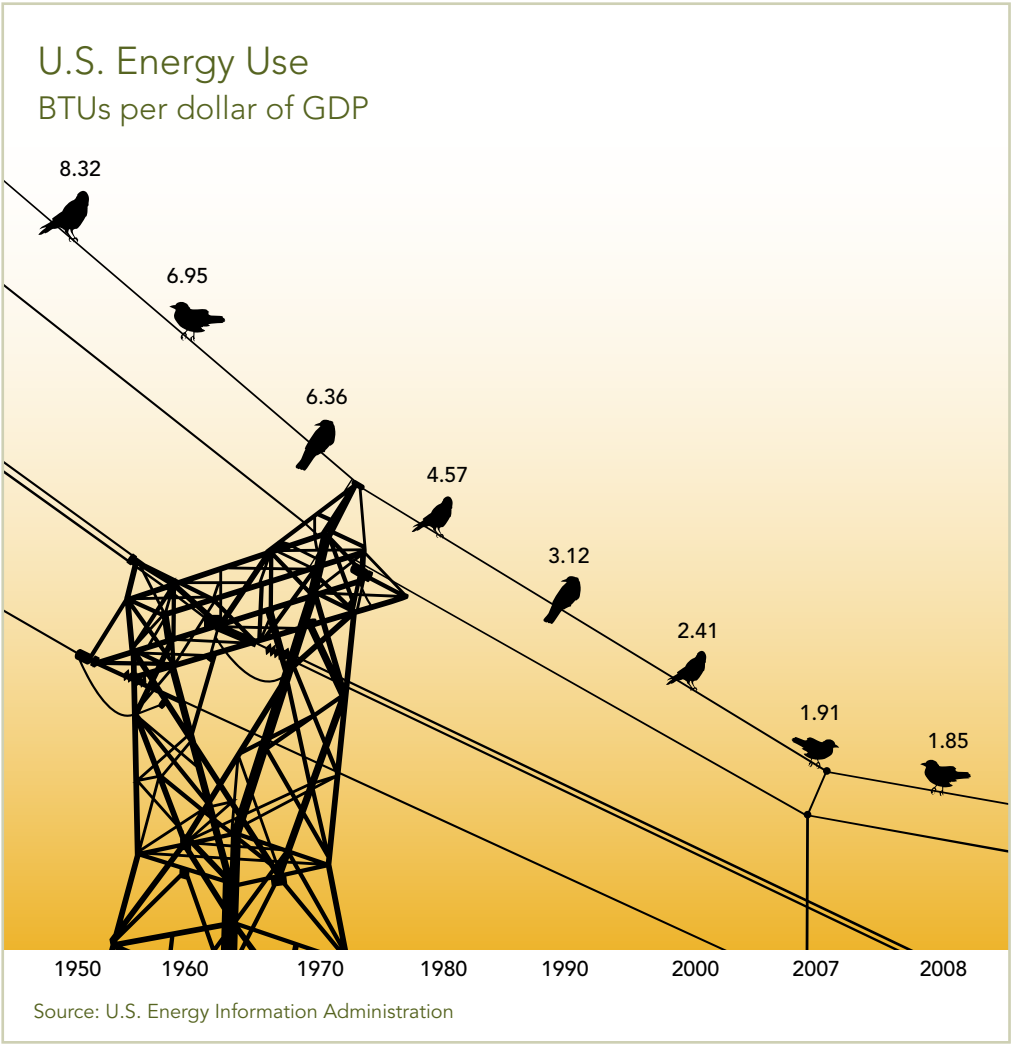
These companies, which made Fortune's list of "100 Best Companies to Work For," allow their "regular" telecommuters to work at home at least 20 percent of the time.

Company	Percent of Regular Telecommuters
Deloitte	93%
Cisco	85%
Brocade Communications Systems	70%
Intel	70%
PricewaterhouseCoopers	70%
Accenture	67%
SC Johnson & Son	41%
American Fidelity Assurance Co.	36%
NetApp	30%
Shared Technologies	26%

Source: Fortune's "100 Best Companies to Work For"

Energy Efficiency

A Success Story Continues, but Loses Power



Source: U.S. Energy Information Administration

Energy efficiency continues to pay dividends. Despite the Great Recession, 2008 saw one of the biggest improvements in energy intensity — the amount of energy used to create one dollar of GDP — of the past decade.

The main driver of energy efficiency measures has long been cutting costs; when oil hit $140 a barrel in 2008, efficiency projects of all kinds became an easy sell. Now that oil prices have eased, to what extent will these projects dry up?

We won't know for sure until the Energy Information Administration releases its 2009 numbers later this year, but there appear to be two broad trends that are continuing, or at least propping up, energy-efficiency efforts: The stimulus is one, and good business sense is the other.

The stimulus bill passed in early 2009 set aside $787 billion dollars to steer a sinking economy back to solid ground. But as of the end of 2009, the feds had spent only a third of the money set aside for projects, so impacts and expectations alike have yet to be fully realized. About $8.6 billion is directed explicitly to energy efficiency, in the form of weatherization programs, more efficient heating and cooling, and building energy retrofits. These projects are aimed largely at the residential market, hoping to take a bite out of the 40 percent of the national energy footprint that buildings generate.

18 percent of employees — including 27 percent of those working for companies with revenue of $1 billion or more — report that computers or lights are left on in their office every night.

— GreenBiz Intelligence Panel, December 2009

In addition, the stimulus dedicates $10.5 billion to "grid modernization" projects, which will encourage the development and dissemination of smart appliances, smart cars and smart buildings, as well as to connect renewable energy sources to the grid. But grid upgrades will also focus on improving the efficiency of the grid itself, which loses roughly 7 percent purely in transmission.

As stimulus funds continue to flow in 2010, we'll see how deep their effects run. But at the company level we are already seeing efficiency projects bear fruit. Nike achieved a rollback of its carbon footprint to 2007 levels without buying carbon offsets: Efficiency and renewables were their carbon- and cost-saving tools. And GreenBiz.com regularly showcased the work of Climate Corps fellows, interns trained by the nonprofit Environmental Defense Fund to work at major companies on efficiency projects. At firms ranging from Cisco to Sodexo to TXU Energy, the group has uncovered $54 million in energy and carbon savings.

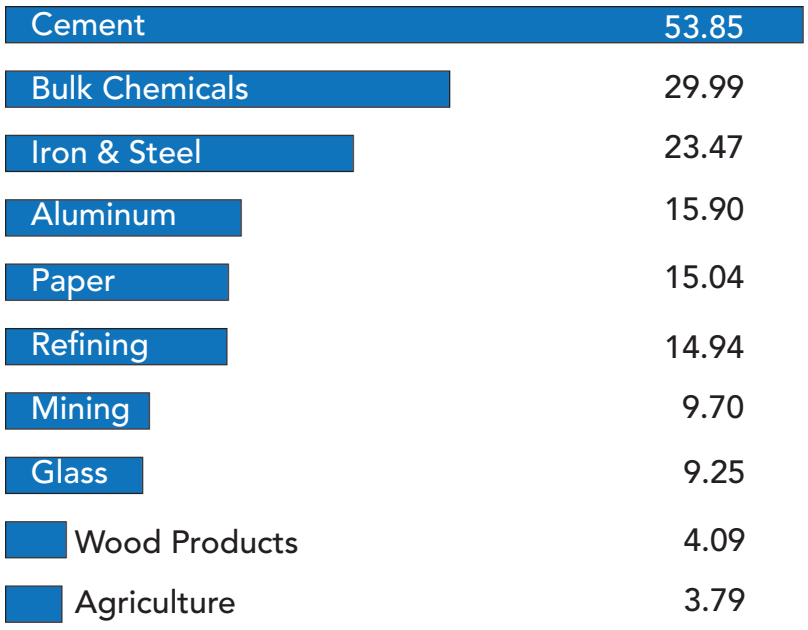
But with the Copenhagen summit failing to achieve a high-impact resolution and the future of carbon laws still unclear, industrial companies may dial back their efficiency investments. The reasoning is simple, and logical in at least the short term: Why invest heavily in energy efficiency now when in the near future the same projects will yield the same efficiency rewards, but also garner rebates, tax credits, carbon credits or all of the above?

Regardless of the short-term implications of climate legislation, and short- or long-term effects of stimulus funding, the bottom line remains that energy efficiency is good for the bottom line, which is why an ever-increasing number of companies and industries are plugging into efficiency programs.

With the Copenhagen summit failing to achieve a high-impact resolution and the future of carbon laws still unclear, industrial companies may dial back their efficiency investments.

Most Energy-Intensive Industries

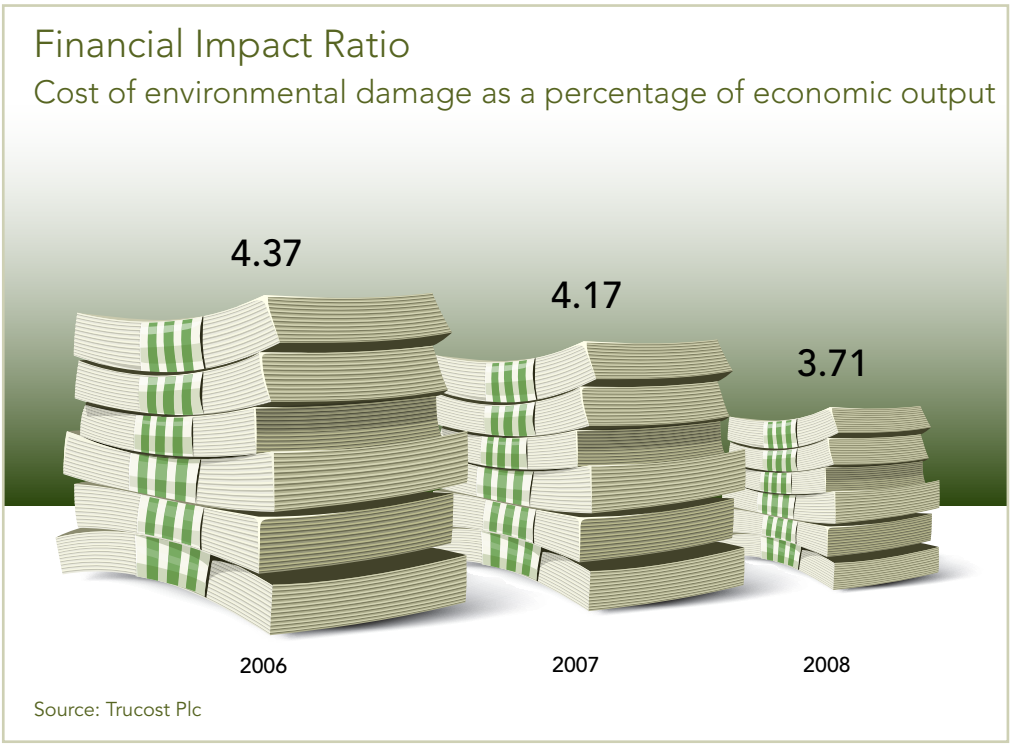
BTUs used per dollar of product shipped to market



Source: U.S. Energy Information Administration

Environmental Financial Impacts

The Price Polluters Pay, or Soon Will, Is Becoming Evident



Source: Trucost Plc

Few companies are directly accountable for the financial costs of their environmental impacts, but that doesn't mean the costs don't exist. And increasingly, regulators around the world are asking companies to internalize the costs of emissions and effluents to the air, water and soil. While each of these regulations differ somewhat, together they directly or indirectly impose a price on carbon, water, and other waste and emissions.

For 10 years, the U.K.-based environmental research firm Trucost has measured more than 700 specific environmental impacts, including greenhouse gas emissions, water and chemical use, and waste, for nearly 4,500 companies worldwide. This information is used by large investors to assess companies' risks and potential liabilities, and by the companies themselves to better understand their impacts and how they stack up to their competitors as well as their geographic neighbors.

To develop their scores, Trucost analyzes each company's publicly available financial information. Trucost's data model can then predict the environmental impact of the company, based on Trucost's understanding of the industries in which it operates. It then incorporates reported environmental data for each company, as available from the company's own public and private disclosures. Companies are then given the opportunity to respond with more or amended information, which is incorporated into the company profile. Trucost uses the completed profile to calculate a company's environmental and financial impacts.

To make apple-to-apple comparisons, Trucost calculates what it calls an Environmental Impact Ratio — a company's environmental damage costs divided by its overall revenue. So, if a company's impacts are $10 million and its sales are $100 million, its Impact Ratio will be 10.

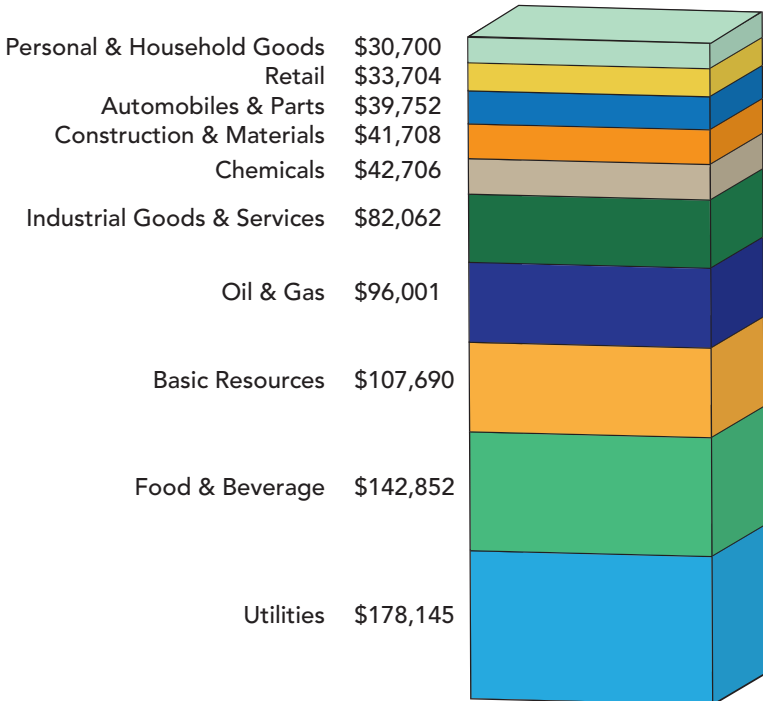
As Trucost puts it, this analysis "enables raw environmental emissions and energy usage data to be converted from little-understood physical units to the one currency that business managers are comfortable with: dollars and cents."

"Companies that are operating in industries that generate significant amount of wastes effectively have off-the-books liabilities and exposures that can, and arguably in the case of greenhouse gases, will soon, result in highly significant financial costs," says James Salo, Trucost's vice president of strategy and research. "Companies will also face this cost in a significant way through their suppliers and supply chain."

To determine whether such improvements in environmental performance are reflected across the wider economy, we asked Trucost to measure the Environmental Impact Ratios of companies listed in MSCI World, a stock market index of 1,500 stocks commonly used as a benchmark for "world" or "global" stock funds. Their combined Impact Ratios show that between 2006 and 2008, overall environmental intensity decreased by about 15 percent. This suggests that improvements in environmental efficiency are widespread. Equally significant, the rate of decline more than doubled between 2007 and 2008 compared to 2006-2007. The largest two-year decrease was seen in construction and material companies, where the intensity dropped more than 25 percent. The biggest jump in impact came from automobile and part manufacturers, which revved up more than 7 percent during that period.

"Companies that are operating in industries that generate significant amount of wastes … will soon result in highly significant financial costs."

Industry Contributions to Environmental Intensity
(billions of dollars)



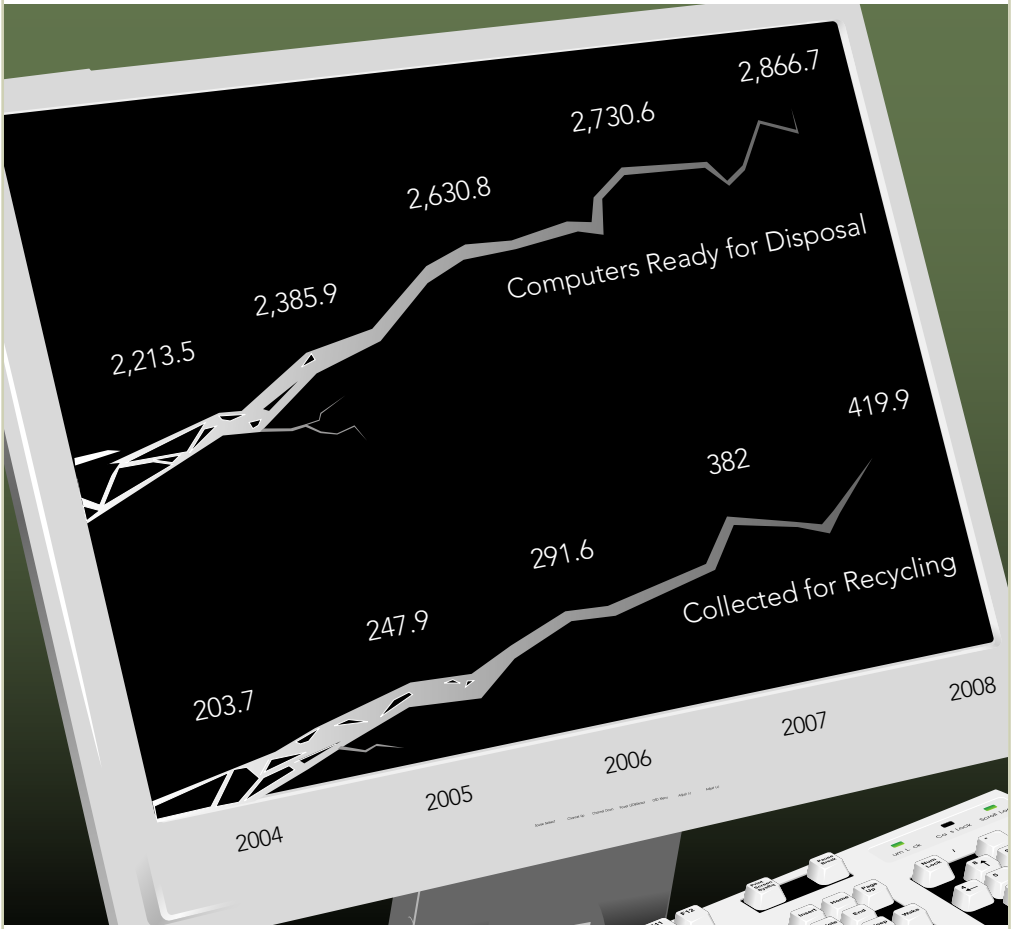
Source: Trucost Plc

STATE OF GREEN BUSINESS 2010

Recycling Molehills Out of Mountains of Waste

Computer Products Discarded and Recycled

Thousand tons per year



Source: GreenBiz.com Research and U.S. Environmental Protection Agency

E-waste collections are, to put it bluntly, making a molehill out of a mountain.

That's not to diminish the efforts of IT manufacturers, who by and large are making steady progress in taking back more and more of their products. The fact remains that electronics recycling in the U.S. is moving at the speed of a vintage 8086 computer.

For this year's report, we shifted tactics on how to measure progress in recycling end-of-life electronics. In the past, we looked at the data collected by the U.S. EPA, which shows millions of tons of e-waste collected but just a fraction actually recycled. This year, we looked at the reported data from eight of the largest IT hardware manufacturers, to see how much they're collecting.

The lack of progress shown in the data above is indicative of shortcomings not just in the recycling process in the U.S., but also in the reporting process. These eight companies — Dell, Fujitsu, HP, IBM, Lenovo, Samsung, Sony and Toshiba — have been reporting in clear and relatively consistent ways their recycling data for at least the last five years, and some for much longer. But these companies, despite representing the lion's share of the global electronics market, are still just the industry leaders. Other high-profile U.S. companies — Apple, for example — don't issue such reports, nor do countless smaller firms.

80 percent of companies — including 85 percent with revenue over $1 billion — have a program to recycle or otherwise responsibly dispose of electronic waste.

— GreenBiz Intelligence Panel, December 2009

Despite the steady growth of collection, all these companies' efforts amount to just a drop in the IT bucket. EPA data shows that in 2008 there were 3.1 million tons of electronics in the waste stream, with just 13 percent of that recycled.

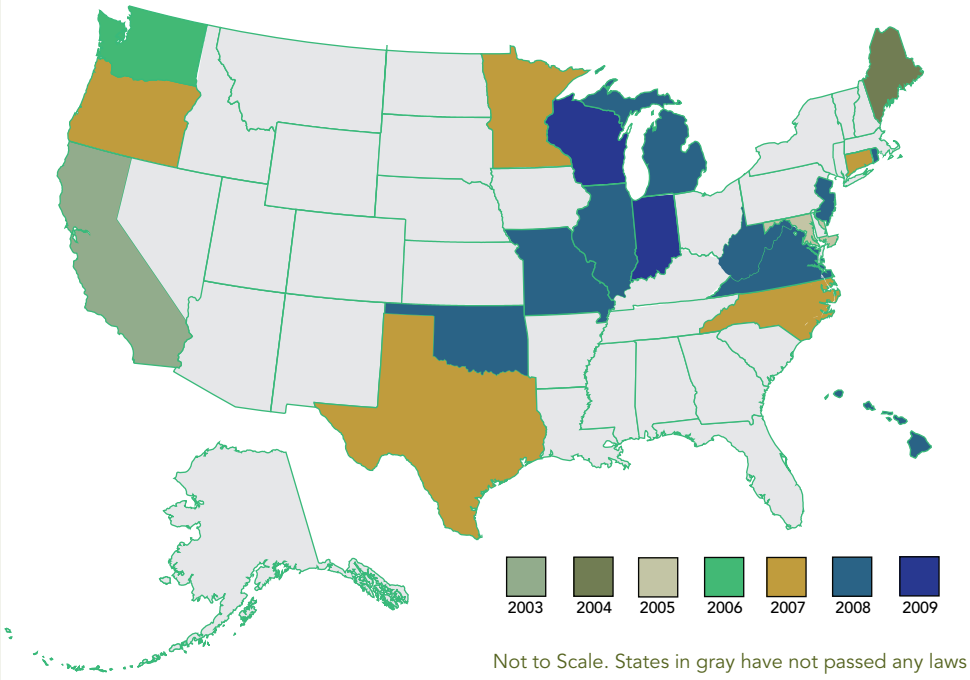
The better news is that globe-straddling firms like Dell, Hewlett-Packard and IBM have recognized that responsible reuse and recycling of end-of-life electronics is rapidly becoming mandatory in their relationships with clients and customers, table stakes for any company seeking to minimize its environmental impacts. But few IT companies are in the electronics-recycling business.

Two things are needed to achieve a sea change in recycling rates. As we see in our Green IT indicator (pp. 42-43), design with recycling in mind is a growing feature of how electronics are made. The other game-changer is the growth of mandatory recycling laws. The map below shows how recycling laws are spreading across states: What started as a trickle with California's 2003 takeback law rapidly has become, if not a flood, at least a gush. In 2008, 10 states passed laws dictating amounts and methods of recycling, bringing the total to 20 states, leading to what may eventually be a national electronics recycling policy.

While pressure is rising from states, there is growing corporate and individual concern, too. Media exposés, including 60 Minutes and Frontline (and our own GreenerComputing.com), are giving the issue new prominence. And 2010 will likely be the year electronics recyclers are asked to become certified for their recycling practices, using either the Responsible Recycling (R2) standards developed by the U.S. EPA and the electronics industry, or the new e-Stewards certification developed by the Basel Action Network. That will ensure that there's a close eye not just on the quantity of recycling, but also the quality.

Globe-straddling firms like Dell, HP and IBM have recognized that responsible reuse and recycling of end-of-life electronics is rapidly becoming mandatory in their relationships with clients and customers.

States Approving E-Waste Takeback Laws, Per Year



Not to Scale. States in gray have not passed any laws

Source: National Center for Electronics Recycling

Fleet Impacts

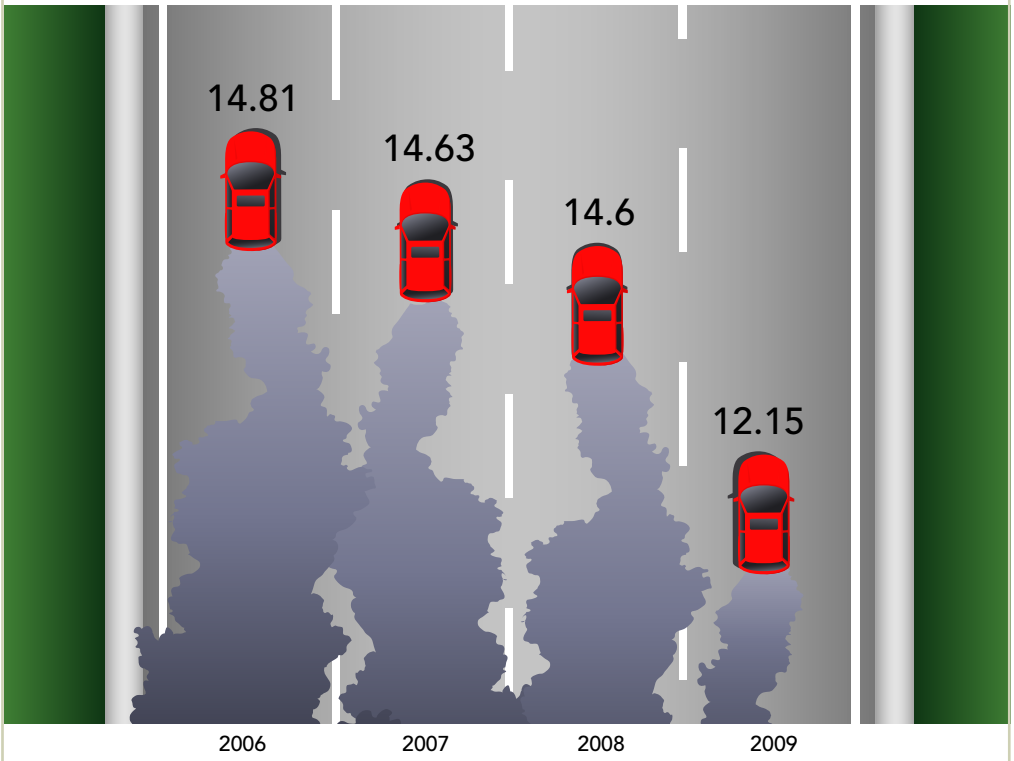
Steering a Slow but Steady Course Toward Savings

19 percent of companies encourage choosing green models when renting or leasing vehicles, as do 18 percent of companies with revenue over $1 billion.

— GreenBiz Intelligence Panel, December 2009

Fleet Impacts

Estimated annual greenhouse gas emissions per vehicle (in tons)



Source: GreenBiz research, based on fuel consumption data from ARI, Donlen, Enterprise Fleet Management, GE Capital Fleet Services, LeasePlan and PHH Arval

The economic downturn got fleet managers steering a steady course in the direction of saving money, which carries mostly good but some bad implications for the greening of the nation's corporate fleets.

On the one hand, the recession is generating increasing interest in driver education and training for some companies — a simple, low-cost initiative that can produce immediate results by lowering fuel consumption and associated greenhouse gas emissions. On the other hand, declining business activity meant there were fewer vehicles on the road that, in some cases, were driving fewer miles, causing many fleet managers to hold on to older vehicles longer rather than trade up for newer, more efficient models. Some green fleet initiatives were further delayed by the woes of the auto industry, which caused carmakers to postpone, reduce or discontinue some models.

The impact of the recession is evident in our indicator, which tracks greenhouse gas emissions per vehicle, based on fuel consumption patterns of some of the largest U.S. fleet management companies. These firms, which oversee vehicles for hundreds of large companies, include ARI, Donlen, Enterprise Fleet Management, GE Capital Fleet Services, LeasePlan and PHH Arval. The addition of new company data this year required us to revise last year's results.

The gradually declining trend of emissions generated per fleet vehicle veered sharply downward in 2009, dropping nearly 18 percent. Anecdotally, our fleet management participants tell us the main driver was the downturn, rather than

the cumulative gains made from fleet efforts to become more efficient. Four-cylinder vehicles, however, are being added in increasing numbers, replacing six- and eight-cylinder guzzlers, which will likely lead to gains that will become more apparent in the coming years.

Some are calling the trend of downsizing to four-cylinder engines the "new normal," with the recession making it a stronger business case: In situations where the choice of car was considered a perk and part of compensation, some companies are instead simply opting for the most efficient vehicle for the job. (It's easier to make these kinds of changes when people are happy to have a job.) Others, meanwhile, are taking the concept of "right-sizing" a step further than simply moving down a vehicle class. Instead they're examining whether the duties and processes can be altered to accommodate a more efficient model.

The growth of telematics — the use of technology to manage fleet use, including optimizing routes to reduce fuel consumption — slowed in 2009 for some fleet management companies, but many of their clients are nonetheless enjoying its positive results. A GE Capital Fleet Services case study showed one of its cable and telecommunications customers used telematics to trim idling by 40 percent, leading to a 30 percent reduction in fuel expenses. The shift also saved GE's customer $113,000 in fuel costs over a nine-month period and cut greenhouse gas emissions by roughly 400 metric tons.

The dominant factor that will continue pushing green fleet initiatives higher up the corporate ladder is fuel prices. When the cost of gasoline spiked in 2008, many responded by right-sizing and downsizing their fleets. The recession dragged down fuel costs, but no one expects the low prices to last. And although the U.S. ended 2009 without a federal climate change law or an international agreement to succeed the Kyoto Protocol, companies are well aware that climate change and the potential for regulation aren't going away.

Some companies aren't taking their foot off the gas (see p. 10), moving forward to convert their fleets to hybrids, set minimum fuel-efficiency policies or eliminate the use of sport utility vehicles — all of which will lead to fewer environmental impacts and thicker bottom lines when gas prices inevitably take an uphill climb.

When the cost of gasoline spiked in 2008, many responded by right-sizing and downsizing their fleets.

Large U.S. Alternative Fuel Fleets

Enterprise Holdings*	7,170
Schwan's	5,800
U.S. Postal Service	4,511
Waste Management	2,399
Johnson & Johnson	2,258
PG&E	2,200
Commonwealth Edison	1,953
Consolidated Edison	1,934
Federal Express	1,852
Ferrellgas	1,800-1,900

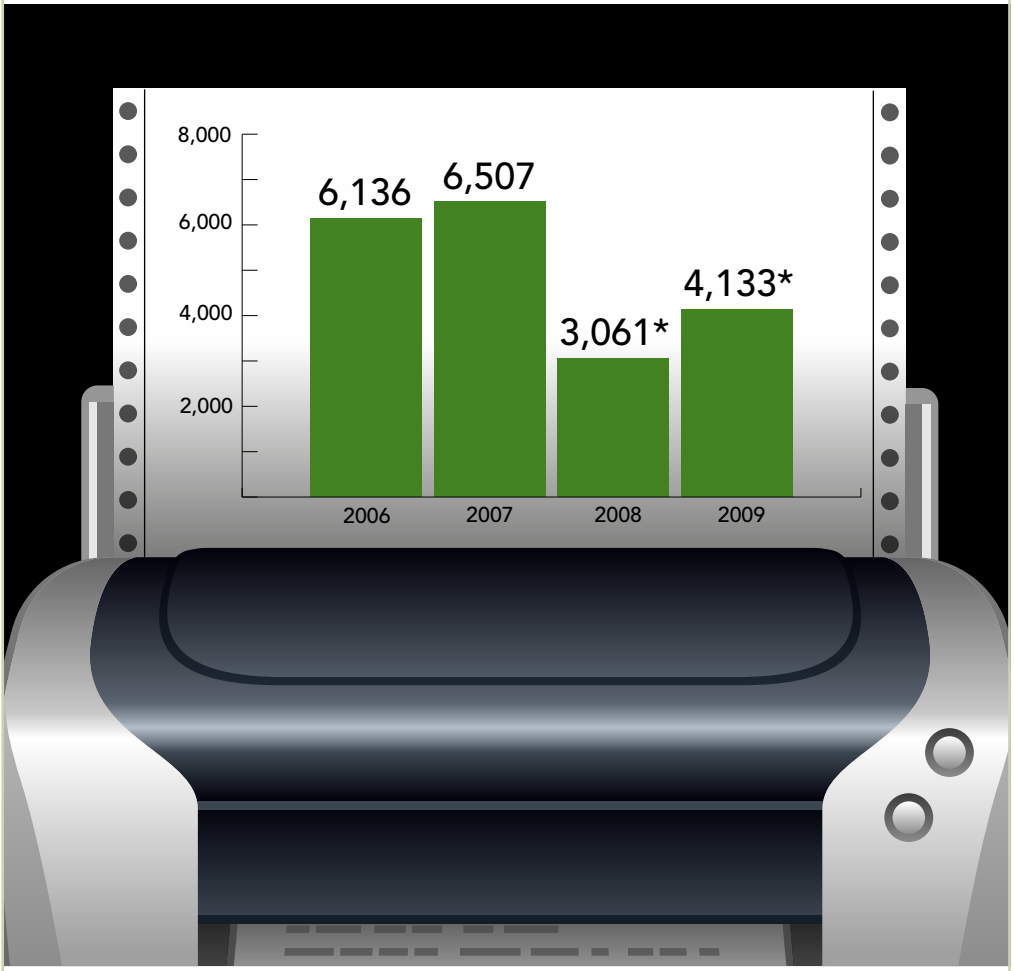
U.S. vehicles only, excludes flex-fuel vehicles

*includes Alamo, Enterprise and National car rental divisions

Source: GreenBiz.com Research

Green IT
A Rapid Rise of Greener Gadets

Green IT
Number of computers certified by Energy Star and EPEAT



* Denotes year of transition to new level of Energy Star certification requirements
Source: U.S. EPA and the Green Electronics Council

You could easily say that green information technology, measured by the number of products bearing Energy Star and EPEAT certifications, has truly come into its own. Not just in the sense of having its own spread here in the State of Green Business report, but in the sense that these two labels, one well established and backed by the U.S. EPA, the other a relative upstart, have weathered the economy in strong fashion, and the future looks even brighter.

Energy Star, the certification launched in 1992 by the EPA and currently covering tens of thousands of products across a number of categories, saw the number of certified computers rise more than 33 percent between 2008 and 2009, despite transitioning in that time to an even more stringent standard for computer energy efficiency. And EPEAT — the Electronic Product Environmental Assessment Tool, administered by the Green Electronics Council — is on pace to continue its meteoric growth.

The expanding adoption of these two green IT certifications follows the rise of awareness of the environmental impacts of IT. Companies — CIOs, CFOs and facility managers in particular — have long been aware of the cost impacts of

filling offices and data centers with energy-sucking machines, and purchasing Energy Star-labeled devices became one way to quickly address that issue.

Now environmental concerns, particularly climate change but also concern about recyclability and toxics in products, are pushing that growth to the next level. The EPEAT standard measures electronics not just on their energy consumption, but on how easily they can be dismantled, how thoroughly manufacturers have reduced or eliminated chemicals of concern from the products, and even the packaging they are shipped in.

The boost these certifications have seen is part of the growing importance of green design in electronics. From ever-more-efficient power supplies and longer-lasting batteries to incorporating post-consumer recycled content and biobased materials into products, manufacturers are finding ways to close, or at least tighten, the loop from end-of-life to new beginnings. While the data showing takeback and recycling of outdated electronics is discouraging (see pp. 42-43), more products on the market are now designed to reduce end-of-life impacts.

With its tiered Bronze-Silver-Gold certification levels, EPEAT has in recent years fomented something of a "race to the top," with growth of Gold-level certifications outpacing other levels. And the label is set to expand in broad ways as well: In addition to beginning work on printer and television standards, EPEAT has recently become a search option on Amazon.com's product listings, and the group is working with the Sustainability Consortium to apply its criteria and methods to a rating system for products beyond consumer electronics.

We expect this trend to accelerate and improve. We'll be watching closely the expansion of a new electronics certification from UL Environment; earlier this year ULE certified its first "Sustainable Electronics." EPEAT has begun to develop new standards for greener printers and televisions, and Energy Star will continue its work on standards for the real IT energy hogs: servers and data centers. The future of IT is looking greener, if not green.

EPEAT has in recent years fomented something of a "race to the top," with growth of Gold-level certifications outpacing other levels.

Most Certified Computer Models
Under EPEAT and Energy Star Programs

Company	Models
Sony	709
Toshiba	414
Hewlett-Packard[1]	287
Acer[2]	224
Lenovo	210
Samsung	199
Dell	191
Asus	164
Fujitsu	89
Apple	75

[1] Includes HP and Compaq
[2] Includes Emachines, Gateway and Packard Bell

Green Office Space

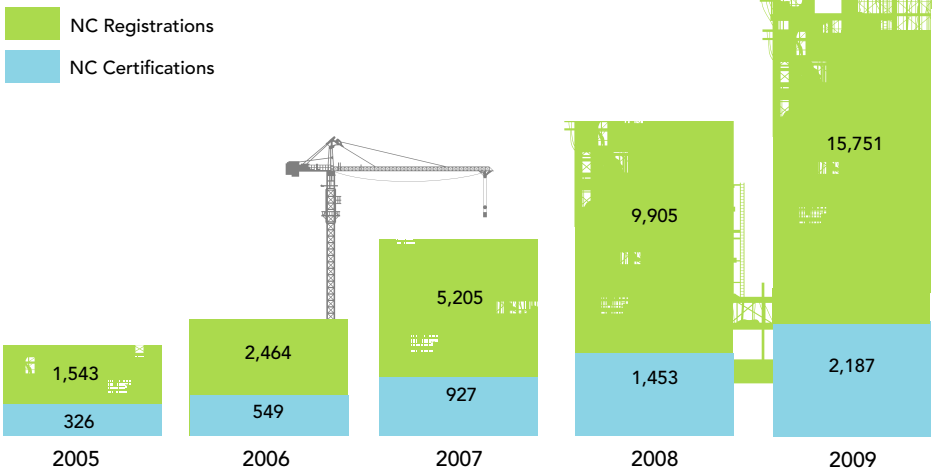
A Life Raft in a Sinking Building Market

48 percent of employees — including 51 percent of those working for companies with revenue of $1 billion or more — do not believe they work in a "green building."

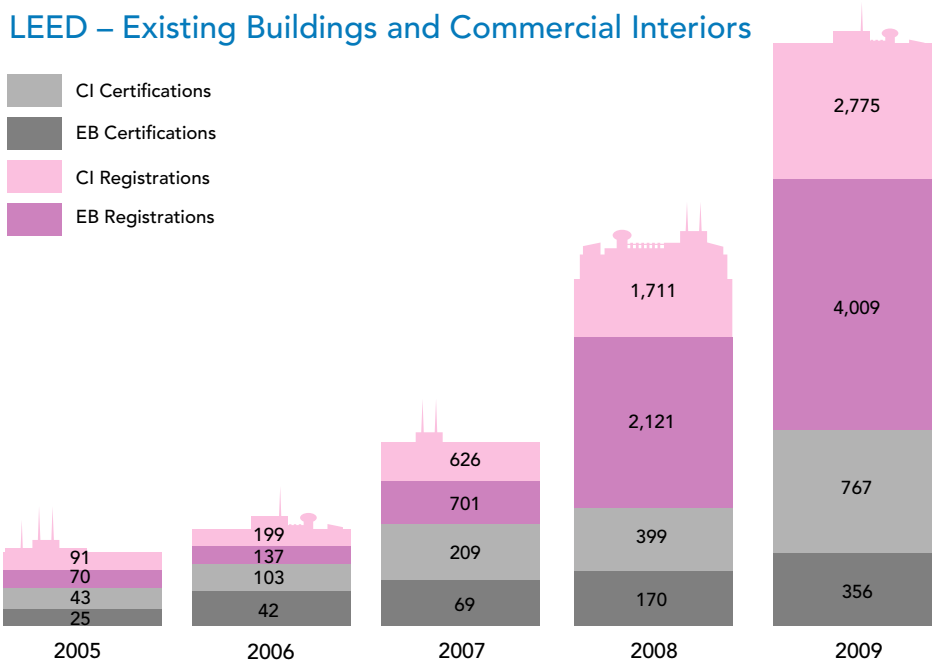
— GreenBiz Intelligence Panel, December 2009

Growth of Green Buildings

LEED – New Construction



LEED – Existing Buildings and Commercial Interiors



Source: U.S. Green Building Council

In a building market that has left huge numbers of owners financially underwater, the LEED green building standard has been a life raft.

The recession hit the building market hard. But while observers and experts predicted LEED-certified commercial buildings would take a beating, the reverse happened: Certifications for both new and existing buildings grew faster than ever, and registrations of new projects continued apace.

While many of these newly certified projects were underway before the downturn, the growth of LEED even while the economy shrank points to a wider

recognition of the benefits of building green. For companies looking to cut costs and boost employee productivity and satisfaction, green buildings have become an obvious choice. Property owners found that tenants clamored for green buildings, so as plummeting rents sent tenants shopping around, a LEED-certified facility added another level of cachet for the spec sheet.

Almost across the board, the U.S. Green Building Council reported increased registrations and certifications of green buildings in 2009 over 2008, with both LEED-NC (new construction) and LEED-EB (existing buildings) — including LEED-EB:OM (Existing Buildings: Operations & Maintenance) — showing record growth. Although certifications in LEED for Commercial Interiors slowed only slightly since 2008, registrations of new LEED-CI projects nearly doubled in 2009. With corporate budgets getting the hatchet, companies looking to green up their offices might set their sights on an interior overhaul rather than a whole new facility.

Some of the repercussions of the recession will likely be felt in 2010 and beyond. So, too, for what was likely last year's biggest news in green buildings: The economic stimulus package, which promised billions for green building retrofits and weatherization. To date, the stimulus has doled out money in a trickle rather than a flood — just a small fraction of the $787 billion allotted has been spent so far — but as these checks continue to be cashed, we expect to see even more impacts on the green building marketplace.

There are other factors likely to expand green building's growth in coming years. Last April, the USGBC launched LEED v3, a reorganization and consolidation meant to bring various standards into closer alignment. The prospect of a new certification sent some project owners flocking to get certified under the existing standard.

Another factor likely to drive up LEED's profile is the boom in LEED Accredited Professionals. By the end of 2009, more than 135,000 individuals had passed the exam to become certified as a green building expert — up from 77,000 in 2008. That helps construct a strong foundation for future green building.

While many of the newly certified projects were well underway before the downturn, the growth of LEED even while the economy shrank points to a wider recognition of the benefits of building green.

New, Big and Green

10 Largest LEED-Platinum Commercial Buildings Certified in 2009

Project	Location	Square Feet
McDonald's Corporation World Headquarters	Oakbrook, Ill.	704,119
San Jose City Hall	San Jose, Calif.	530,000
Dell Children's Medical Center of Central Texas	Austin, Texas	473,000
550 West Washington	Chicago, Ill.	400,492
Lafayette Tower	Washington D.C.	327,688
1225 Connecticut Ave.	Washington D.C.	231,782
2000 Tower Oaks Blvd.	Rockville, Md.	197,283
The Christensen Corporation Office	Boise, Idaho	195,570
St. Olaf College Science Complex	Northfield, Minn.	178,050
Sweetwater Headquarters	Fort Wayne, In.	155,300

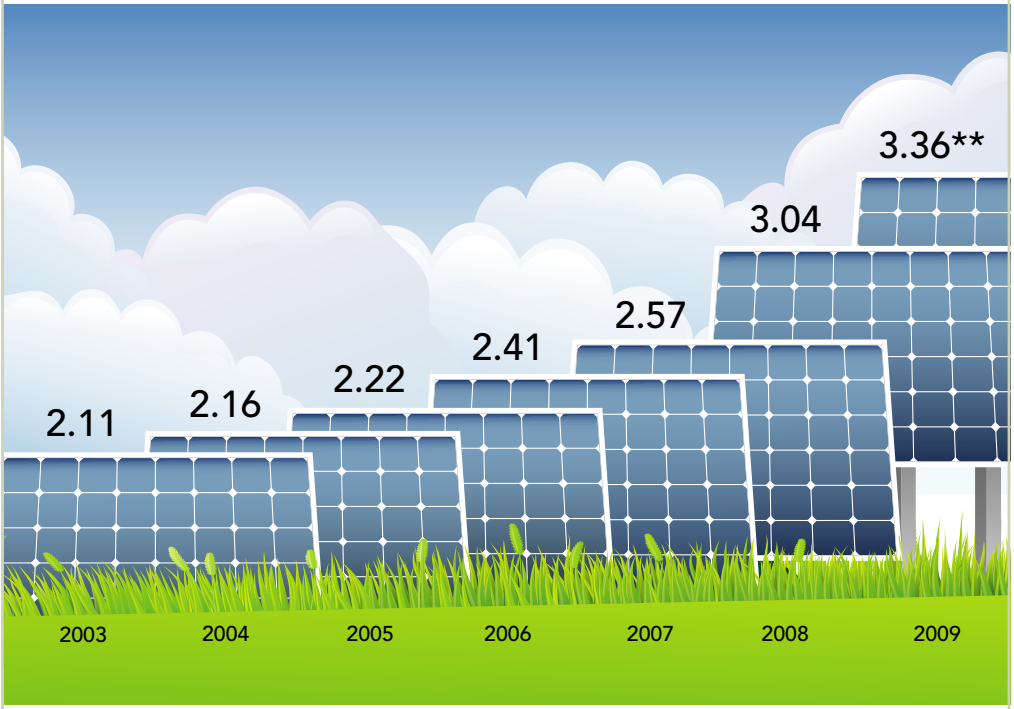
Among the largest are three unnamed projects and two residential buildings that we omitted from this list.

Green Power Use

Steady Growth, but No Help from the Economy

Renewable Energy Use

Percentage of all U.S. electricity generation*



*Excludes hydroelectric power **As of September 30, 2009
Source: U.S. Energy Information Administration

Renewable energy from solar, wind, biomass and geothermal sources make up just a fraction of total electricity generation in the U.S., but that small slice is expanding, despite the lack of market signals the industry says are needed to ensure long-term growth.

Non-hydro renewable energy generation increased 17.5 percent in 2008, the last full year for which data is available. As a whole, this accounts for 3 percent of all electricity generation. This figure, however, doesn't reflect the full force of the economic recession, which reached full swing in 2009. The green power industry was not immune to the downturn, and although generation still grew, its rate of growth slowed.

An analysis of data from the first three quarters of 2009 shows non-hydro green power generation increased nearly 9 percent compared to the same period the year before. But overall electricity generation dipped along with economic activity, so green power's share actually inched up to nearly 3.4 percent of all generation between January and September of 2009.

Several factors in play during 2009 both helped and hindered the renewable energy sector's performance. The wind industry, for example, credits the 2009 economic stimulus with helping it avoid a potentially horrendous year. Instead, thanks to the federal windfall provided by that legislation, the sector set a record by installing nearly 10,000 megawatts of new generating capacity, making wind one of the two top sources for all new electricity generation next to natural gas.

Grid-connected photovoltaic solar installations in 2009 were projected to rise as much as 30 percent, which is less than the highs of previous years — or future years, estimates Larry Sherwood, an analyst with the Interstate Renewable Energy Council. Utility-scale projects generated much of the activity, driven by a tax credit extension passed in late 2008, while innovative financing models opened up new opportunities for residential installations, such as PACE (Property Assessed Clean Energy), which allows homeowners to finance solar installations (and energy-efficiency retrofits) through their property taxes over 15 to 20 years. Sherwood predicts the 2010 outlook could double new installations put in place in 2009 as stimulus funds work their way through to new projects and projects in the crowded pipeline go online. The falling cost of solar modules will only help.

Geothermal power capacity grew roughly 6 percent in 2009, with more than 140 new geothermal energy plants under development in the U.S. The Geothermal Energy Association estimates the industry could enjoy 7,000 megawatts of new baseload geothermal energy in the next few years, due to stimulus grants, federal loan programs, and strengthened renewable energy standards. Biomass, too, is heating up: The U.S. Energy Information Administration estimates the total installed capacity of wood biomass power generation is 6,000 megawatts and predicts that this figure could double over the next 10 years.

Many within the renewables industry point to the potential of a federal renewable portfolio standard (RPS) to unleash a tsunami of momentum. Wind insiders, for example, claim such an RPS would boost turbine manufacturing, which, unlike the project side of the industry, suffered disproportionately in 2009 because of low demand and high inventories. Already, 24 states and the District of Columbia have RPS policies, and another five have nonbinding goals.

Already, 24 states and the District of Columbia have renewable energy portfolio policies, and another five have nonbinding goals.

Top Renewable Energy Countries 2000-2008

Country	Billion Kilowatt-Hours	Country	Compound Annual Growth
United States	133.97	Hungary	44.32%
Germany	72.01	Slovakia	43.75%
Spain	36.67	Poland	30.77%
Japan	23.17	Ireland	28.62%
Italy	19.17	India	24.55%
Brazil	19.02	Australia	24.23%
United Kingdom	18.27	Spain	24.14%
India	16.72	China	23.26%
China	15.49	Portugal	20.67%
Canada	11.48	Austria	18.85%
France	11.48	Norway	18.59%
Sweden	11.41	Germany	18.47%

Excludes hydroelectric power

Source: U.S. Energy Information Administration

Greenhouse Gas Commitments

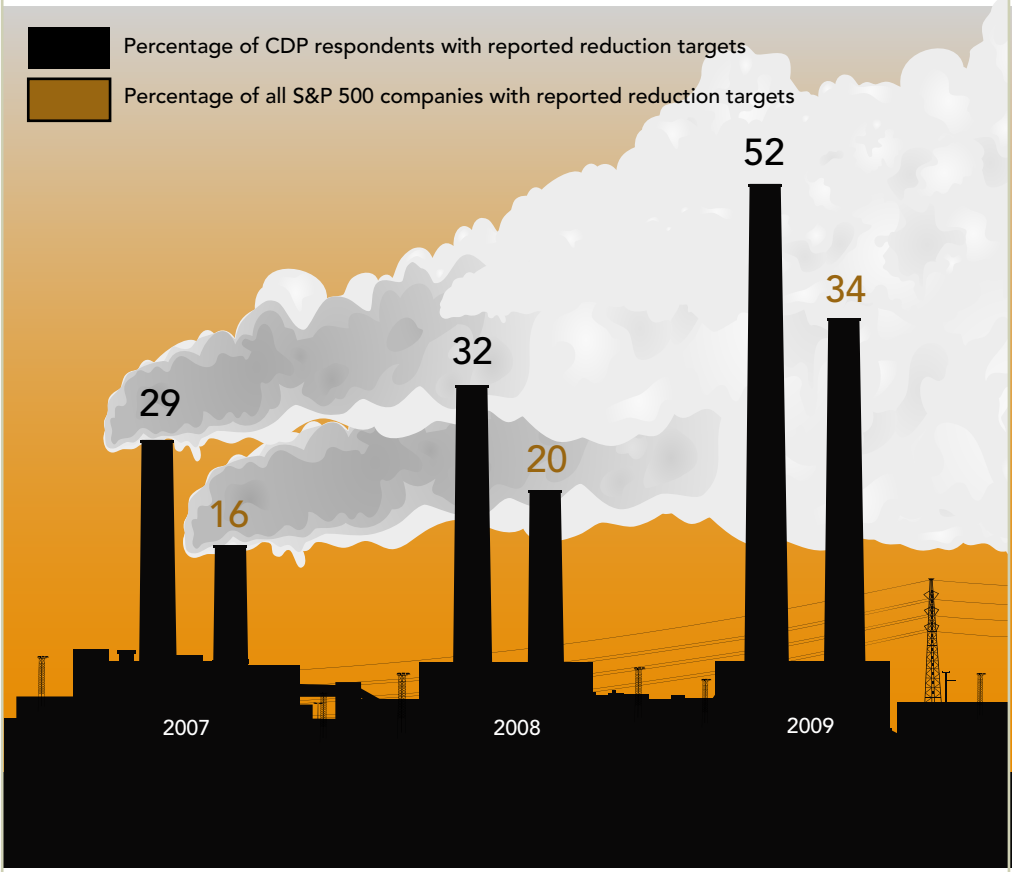
Most Companies Still on the Sidelines

22 percent of companies — including 14 percent with revenue over $1 billion — have set emissions reduction goals but have not published them.

— GreenBiz Intelligence Panel, December 2009

Company Commitments

Percentage of S&P 500 companies reporting reduction targets



Source: Carbon Disclosure Project

Movement toward a U.S. climate bill and post-Kyoto international treaty inspired U.S. companies to set and report emissions reduction goals in greater numbers in 2009. Such commitments aren't intended solely for stakeholders. More businesses are viewing carbon as a proxy for efficiency and moving to wring carbon emissions from their operations and supply chains.

We set out to measure how these factors are driving U.S. companies to address climate change by using Carbon Disclosure Project data to assess the emissions reduction goals of the Standard & Poor's 500 Index. We found that 52 percent of S&P 500 companies that responded to the CDP reported emissions reduction targets in 2009, up from 32 percent of CDP respondents the year before. This is solid growth, but still represents just a third of the overall S&P 500 index.

Of those annualized targets, 37 percent of the reductions were set at 2.5 percent or less, while nearly 15 percent didn't specify a target. There was evidence that targets became more ambitious in 2009: The number of companies setting annualized reduction targets greater than 5 percent grew from 1 percent to 9 percent. However, these commitments still seem timid considering that climate experts call for developed countries to cut emissions by 3.9 percent a year to avoid the worst impacts of climate change. A separate analysis of the emissions reduction goals set by Global 100 companies

concluded we would miss these targets by years and, in some cases, decades.

By sector, consumer staples companies led the charge, with 72 percent reporting emissions reduction targets. That's a sizeable leap from 2008, when 38 percent reported targets, but the CDP chalks this up to the risk-averse nature of the sector, specifically the desire of major brands to protect their reputations.

Previous CDP research into the climate strategies of both U.S. and global companies suggests a preference for absolute carbon dioxide-equivalent targets based on the belief that they are more transparent and deliver tangible environmental benefits. But market forces — not science — most often drive the setting of emissions reduction targets, which can also include intensity or consumption goals, the CDP found. Such goals show relative reductions in carbon, not absolution reductions.

As a result, we are starting to see companies seek bold emissions reduction targets of up to 85 percent by 2050 that address both business patterns and scientific recommendations. For example, U.K. telecom giant BT devised a Climate Stabilization Intensity Target model in 2008, which sought to tie financial and environmental performance to desired emissions reductions. Software company Autodesk then built upon this by devising the Corporate Finance Approach to Climate-Stabilizing Targets, or C-FACT, which it claims goes further by making the approach open source in the hope that other companies will adopt and advance it.

It's unclear whether others will use C-FACT, but we expect carbon management to continue its ascent as domestic and international regulatory activity continues in 2010. The lineup of software systems to help organizations measure and manage their impacts will expand in lockstep, from startups like Hara and Enablon to heavyweights that include SAP and Microsoft. Enterprise carbon accounting software purchases will grow multifold in 2010 as companies strive to better understand their climate impacts and create real-time feedback loops.

With many anticipating regulatory action in the short term, it wasn't surprising to find that the number of S&P 500 companies setting emissions reduction targets grew decisively.

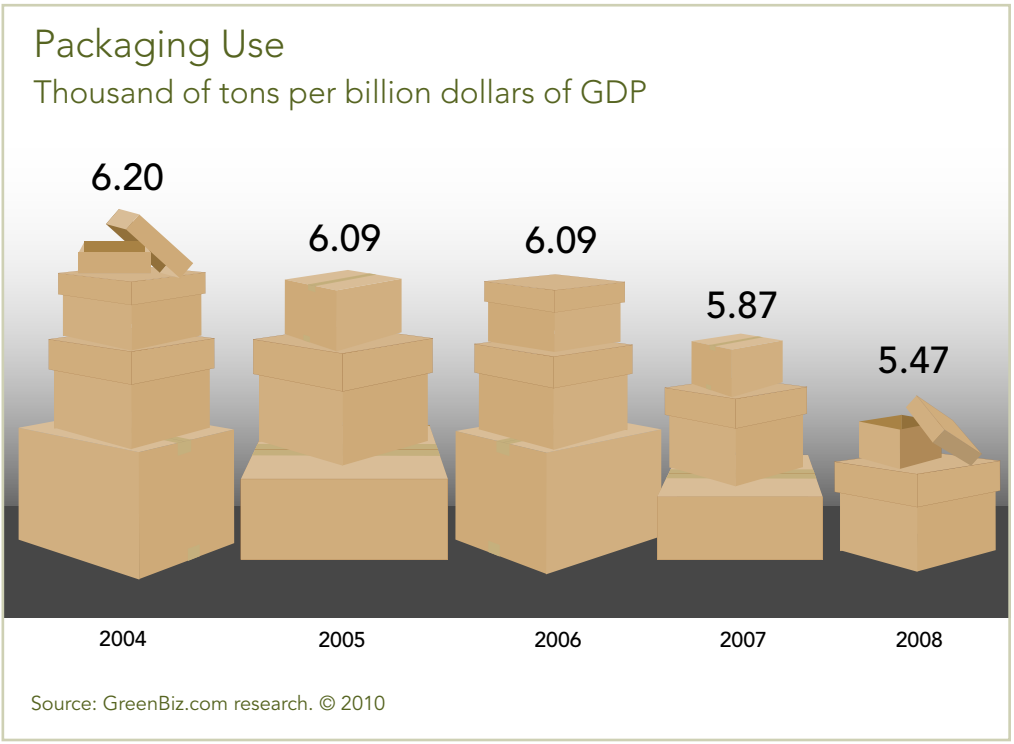
10 Large Carbon Neutral Commitments

Company	Target Year	Annual Revenue
Google	2007	$21.8 billion
Dell	2008	$61.1 billion
CB Richard Ellis	2010	$5.1 billion
Kohl's	2010	$16.4 billion
NewsCorp.	2010	$30 billion
Timberland	2010	$1.4 billion
Nike	2011	$18.6 billion
Exelon	2020	$19 billion
Interface	2020	$1.1 billion
REI	2020	$1.4 billion

Source: GreenBiz.com research

Packaging Intensity

Shrinking Along with Company Budgets



As budgets get lighter, apparently so do packages.

In our research into packaging intensity this year, we saw a noticeable dip in the amount of packaging used per dollar of GDP. Although the economy grew slightly between 2007 and 2008, paper used in packaging dropped significantly for the second year running, plastics of all types dropped noticeably after two years of steady growth, and aluminum held almost perfectly steady, with a slight bump up in 2008.

The drop is due in large part to the practice of "lightweighting" — reducing the amount of materials used to protect, ship and display products on shelves. Lightweighting is just one of several techniques that have gained in prominence recently, with companies including Coca-Cola, Frito-Lay, Solo Cup and many others introducing new packaging made from bio-based materials, post-consumer recycled materials, and compostable packaging.

Of all these trends, lightweighting has been the key driver to packaging reductions, gaining currency with manufacturers for the simple reason that it gains them currency: Using fewer materials directly lowers costs.

The economy is not the only driver of lightweighting, of course. Companies are increasingly seeing the need to watch their carbon impacts, and lighter shipping containers not only reduce emissions of greenhouse gases, but also pack more products into fewer loads, which drives further cost savings. And right-sizing packaging can also give manufacturers and retailers a good story to tell and can make for happier customers — Exhibit A is Amazon.com's minimalist "Frustration-Free Packaging" initiative launched in 2009.

Trimming the amount of materials is not a new trend; it follows on decades of reductions that have happened behind the scenes and before our eyes. As the

box below shows, manufacturers over the last 40 years have used technological innovations to squeeze more packages out of the same amount of raw materials, achieving anywhere from 30 to 75 percent improvements over that time.

Simply switching to lighter packaging is not a silver bullet for the impacts that packages have on the planet. Anne Johnson, a program manager at GreenBlue and the director of the Sustainable Packaging Coalition (SPC), urges manufacturers to think smart about packaging rather than simply thinking light. For example, going for minimal packaging is good for relatively low-impact products, but not necessarily for products that are both resource intensive and prone to spoilage — think Barbies vs. barbeque meats. Johnson says the SPC is encouraging companies to get a better bang for their environmental buck by putting resource-rich products in packaging that can reduce spoilage during transit while also extending products' shelf lives.

Last year also saw the introduction or expansion of sustainable packaging standards that will shape how goods get wrapped in the future. Walmart introduced version 3.0 of its Sustainable Packaging Scorecard software; the SPC released its framework for sustainable packaging, giving manufacturers criteria for evaluating the impact of their wrappers; and the International Standards Organization began work on the development of a new global ISO certification for sustainable packaging.

Packaging intensity dropped faster in 2008 than in previous years, but the improvements are still fractional. As the economy picks up speed, we'll see if reduced packaging is merely a sign of the times.

Manufacturers over the last 35 years have squeezed 60 percent more cans out of the same pound of aluminum.

Less Is More

How innovation and technology have reduced packaging

A series of materials innovations and technology advances over the past few decades have allowed packaging manufacturers to incrementally reduce the amount of materials used in most consumer packaging, from bottles to bags. Below is an accounting of some such innovations. The table below shows, for example, that a typical milk jug contains about half the plastic it did 45 years ago, while a plastic grocery bag has shed nearly 80 percent of its weight over the past 35 years.

Packaging Type	Measure	First year of data	Initial Measure	Final year of data	Final Measure
Plastic grocery bag	Thickness	1976	2.3 mils	2009	0.5 mils
Plastic fruit sack	Thickness	1970	1.05 mils	2009	0.4 mils
Plastic trash bag	Thickness	1975	2.5-3.0 mils	2009	0.4 - 1.1 mils
PET 2-ltr bottle	Weight	1978	68 grams	2009	48 grams
HDPE milk jug	Weight	1965	120 grams	2009	64 grams
Aluminum can	Weight	1972	20.8 grams	2009	13.3 grams

Source: Source: The Property and Environment Research Center

Paper Use and Recycling

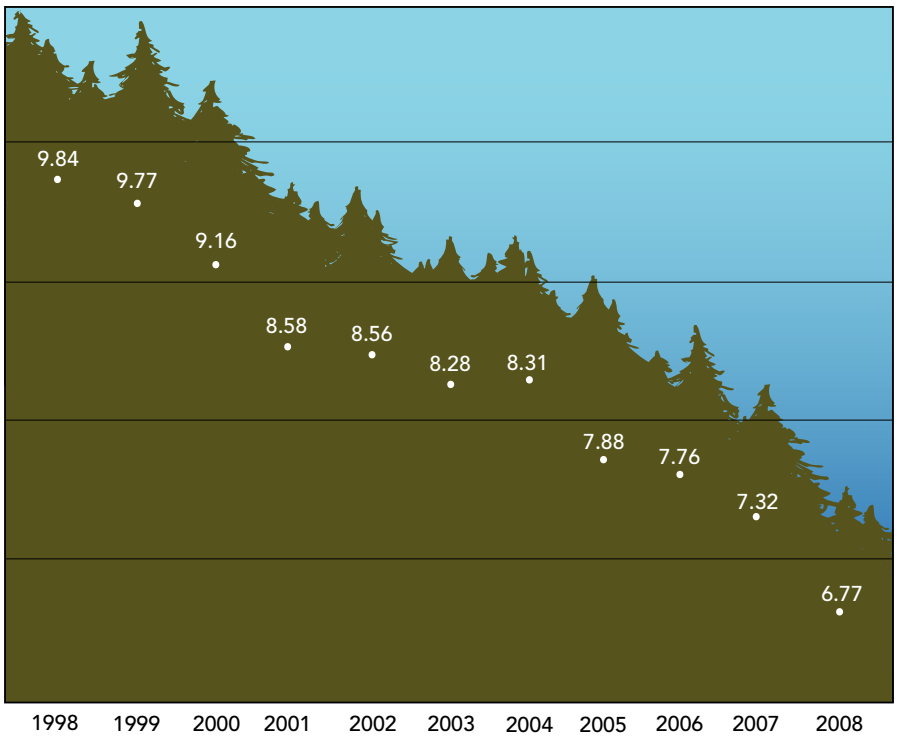
Lower Paper Use Leads to Higher Recycling Rate

93 percent of employees — including 96 percent of those working for companies with revenue of $1 billion or more — report that they have an easily accessible recycling bin at work.

— GreenBiz Intelligence Panel, December 2009

Paper Intensity

Thousands of tons of paper per billion dollars of GDP



Source: American Forest & Paper Association

Although the economy has hit the market for recycling paper hard, progress in using paper more efficiently is continually improving.

For the first time since 2001, the year of the last national economic downturn, the amount of paper recovered in the U.S declined, by about 2.5 million tons. But at the same time, total paper consumption dropped nearly three times as much, so the overall percentage of paper recovery rose. In fact, the intensity of paper use — the amount of paper used per dollar of GDP — improved by the largest margin since the boom year of 2000.

Despite taking a serious hit — the value of a ton of recovered paper dropped by as much as 90 percent at the beginning of 2009 — the much-feared shutdown in municipal collection programs didn't materialize. If cities have been unable to sell their collected recyclables for a profit yet, at least they're not at a point where shuttering programs is the only solution.

With steady improvements spanning good times and bad, this seems like the year to ask: How good is good enough? We've ranked paper intensity as a "swimming" indicator for three years straight, but at what point does steady progress become more like business as usual?

The American Forest and Paper Association, an industry trade group, has been setting goals for recycling rates since 1990 — and handily achieving them. The

group set a target of 55 percent in 2005, but surpassed it so quickly that a new goal of 60 percent by 2012 goal was put in place. The box below shows current recovery rates at 57.4 percent, putting the latest target within easy reach.

Achieving a step change in recycling rates is no easy feat, although data show it is possible: The recovery rates for corrugated cardboard, which occurs largely in business-to-business transactions, are currently above 80 percent. Even though many individuals have become accustomed to recycling paper at work just as at home, building managers still must manage a myriad of challenges to get the paper from your blue bin to recyclers, such as altering longstanding contracts with waste haulers to require recycling.

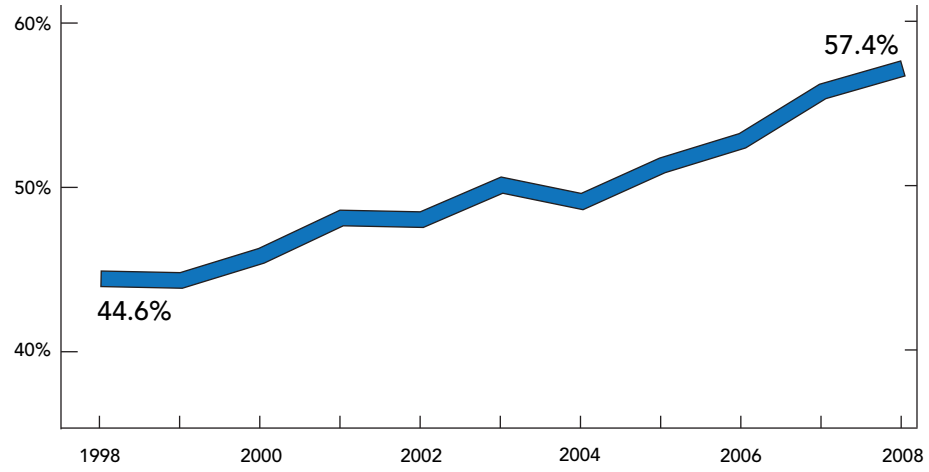
Implementing solutions to these and other challenges is still a ways off, and whether they'll take the form of infrastructure improvements, legislated mandates or both remains to be seen, although paper sourcing and disposal alike are coming under closer scrutiny. Case in point: In 2009, Gibson Guitars was investigated for potentially importing illegally sourced rosewood from Madagascar. The company was the first to fall under the jurisdiction of the newly expanded Lacey Act, which can bring heavy fines and potential jail time to companies that aren't closely tracking their supply chain for forestry products, including paper.

The good news is that a growing number of companies have already begun taking stock of their supply-chain impacts, so adding paper products is not as daunting a task as starting from scratch. And a number of tools exist to simplify the process: Companies can use the Environmental Paper Assessment Tool developed by Metafore (now part of the nonprofit group GreenBlue) to make sustainable paper procurement decisions, and an ever-growing number of manufacturers and retailers are earning certification from the Forest Stewardship Council or the Sustainable Forestry Initiative. All of which makes it easier for companies to keep their papers' impacts under wraps.

Despite taking a serious financial hit, the much-feared shutdown in municipal collection programs didn't materialize during 2009.

Paper Recovery Rate

Percent Recovered of Total Paper Supply, 1998-2008



Source: American Forest & Paper Association

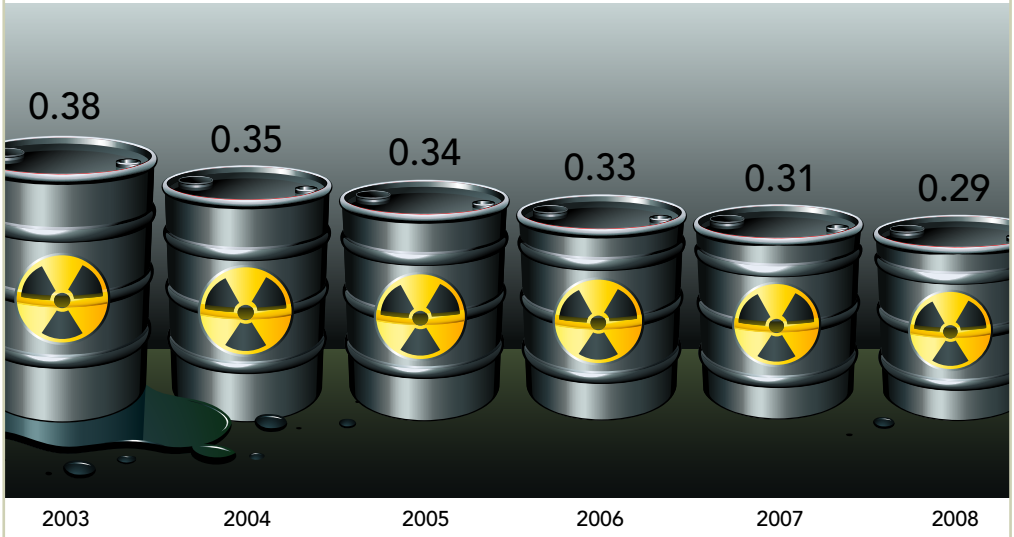
STATE OF GREEN BUSINESS 2010

Toxic Emissions

Steady Declines May Understate the Extent of the Problem

Toxic Intensity

Pounds of emissions per thousand dollars of GDP



Source: U.S. Environmental Protection Agency

Twenty-five years ago, a Union Carbide pesticide factory in Bhopal, India, leaked roughly 40 tons of poisonous methyl isocyanate gas, killing thousands of people in what has been called the world's worst industrial accident. A subsequent accident at a West Virginia plant led to passage in 1986 of the Emergency Planning and Community Right-to-Know Act, which laid the foundation for the public reporting of industrial chemical hazards through the Toxics Release Inventory, a vast database covering more than 650 chemicals now used in nearly 21,700 facilities.

The U.S. EPA released the latest TRI raw data and analysis in record time this year, giving us the opportunity to include 2007 and 2008 data in this report, unlike previous years where the most recent data was three years old.

U.S. facilities released or disposed of 4.1 billion pounds of chemicals in 2007, a roughly 5 percent drop over 2006. This downward trend continued in 2008, with the release or disposal of nearly 3.9 billion pounds, a 6 percent year-over-year decline. Emissions are also declining incrementally when normalized against gross domestic product.

The annual decline is slight but the overall results are more impressive when considered over time. For example, total emissions and releases fell 31 percent between 2001 and 2008. Much of this is due to the metal mining sector, whose disposals dropped 49 percent, and electric utilities, which produced 15 percent fewer emissions and releases over the same time frame.

Manufacturing facilities are also producing less toxic waste: Production-related waste declined 1 percent between 2001 and 2007, while production levels

increased each year by an average of 2 percent. Between 2007 and 2008, production-related waste shrunk 8 percent, while production levels declined 3 percent.

Other facets of the latest TRI data, however, are troubling. From 2001 to 2008, total surface water discharges actually grew 1 percent. Disposals of persistent bioaccumulative toxic chemicals, including lead and mercury, also increased.

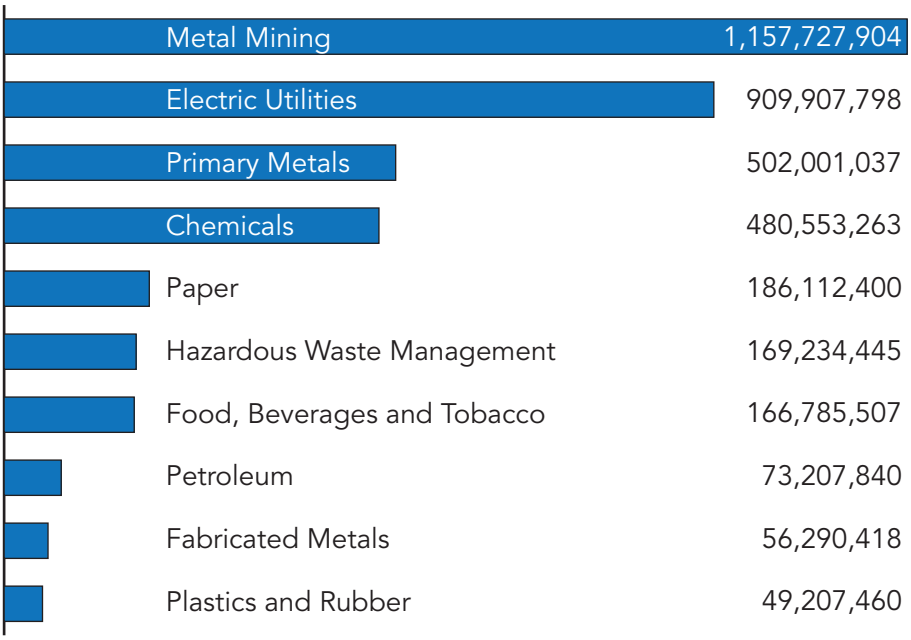
The Obama administration reinstated the TRI's former reporting rules after they were weakened under President George W. Bush. As a result, the 2007 data was collected under different reporting requirements, which raised the threshold for the disclosure of some toxic chemical releases, while the former, stricter rules applied to the 2008 data and beyond. As such, the 2007 data may be underreported due to the lax requirements, making the 2008 decline even greater.

Despite many who herald the TRI as a successful right-to-know program, it is not without limitations. New chemicals haven't been added to the list since 2001, while industry sectors haven't been added since 1998. This, despite the fact that hundreds of new chemicals are introduced every year. As a result, some, including the nonprofit watchdog group OMB Watch, worry that what seem to be steady declines may be understating the serious problem of toxics in the environment.

In the 2001-2008 time period, total surface water discharges grew 1 percent, as did disposals of persistent bioaccumulative toxic chemicals, including lead and mercury.

Toxic Emissions by Industry, 2008

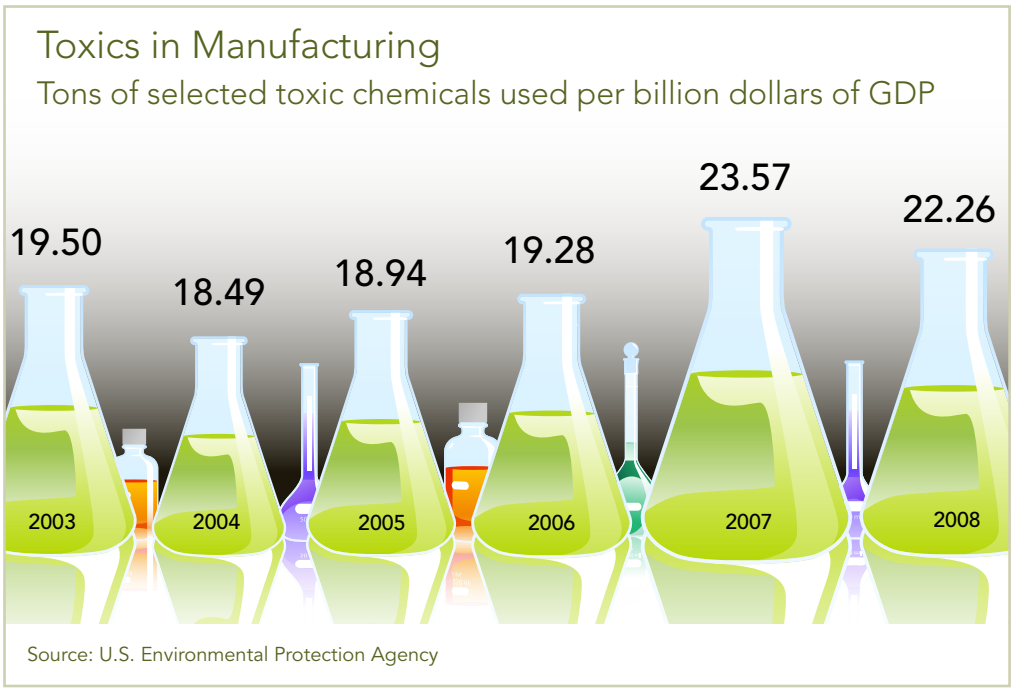
Pounds



Source: U.S. Environmental Protection Agency

Toxics in Manufacturing

Still Seeking the Formula for Success



Last year's research into the use of toxic chemicals in manufacturing proved to be a tricky issue to measure quantitatively, and this year was little different.

There are roughly 85,000 chemicals approved for use in the U.S., and we know very little about the health and environmental impacts of most of them. But the 20 we track, from the EPA's persistent bioaccumulative toxins list, rank among the most hazardous.

The data shows a slight decline in the use of these chemicals relative to GDP, although the numbers are still well above where they were even two years ago. Although any reduction is good news, we will have to wait and see if this trend continues (or accelerates), or whether this dip is just a flash in the pan.

Among the biggest obstacles to real progress on greening chemicals is the sheer complexity of the task at hand. In addition to the scientific challenges posed in finding alternative formulations to bad actors, there are policy challenges aplenty. A report published in early 2010 showed that about 20 percent of the already-overwhelming number of chemicals in use today are classified as confidential business information, and are thus unknown in terms of their impacts.

The EPA during the Obama administration has lately begun to shift its focus toward a tightening of controls over the chemicals in its jurisdiction, while also beginning to regularly scrutinize new chemicals of concern. Barring any legislative efforts on reforming chemicals policy — a tall order in an election year, if ever — the EPA's stepped-up efforts will likely lead to a reduction in some of these toxics, as well as the development of safer alternatives.

Collaboration for the development of safer alternatives is one of two promising trends we're seeing from an innately secretive industry. The EPA Green Chemistry Challenge and Design for the Environment program have encouraged the creation and adoption of safer alternatives to hazardous chemicals, with

BASF, Dow Chemical, Procter & Gamble and others receiving recognition — as well as a potential market advantage — for making cleaner, greener chemicals.

In addition to developing better chemicals, increased disclosure of product ingredients was a welcome trend in 2009. SC Johnson moved to disclose all ingredients in its products — leapfrogging a less-comprehensive proposal adopted by cleaning products trade groups. Apple, one of the more secretive information technology firms, phased out flame retardants and PVC from its products as part of a wide-ranging environmental platform.

But trailing far behind these industry-leading companies are the vast majority of firms that are still getting up to speed on just how to cut the risks from their products. GreenWERCS, a project launched by Walmart last year, aims to evaluate and score 3,500 chemicals on their potential hazards, and share that information with its legions of suppliers to try and move manufacturers away from the worst of the worst chemicals and toward greener pastures.

Consumer demand can also help drive this shift; as we saw with the case of the plasticizer bisphenol A (BPA) in 2008 and 2009. After widespread public outcry, companies quickly reshaped the market for food and beverage containers, with SIGG Switzerland CEO Steve Wasik going so far as to publicly apologize for his company's mislabeling of BPA-containing water bottles.

But all these signs of progress are simply scattershot indications that awareness is on the rise, and that at least some companies and industries are responding. It seems likely that we're still a long ways from the steady declines in the use of these toxic chemicals that will show real progress.

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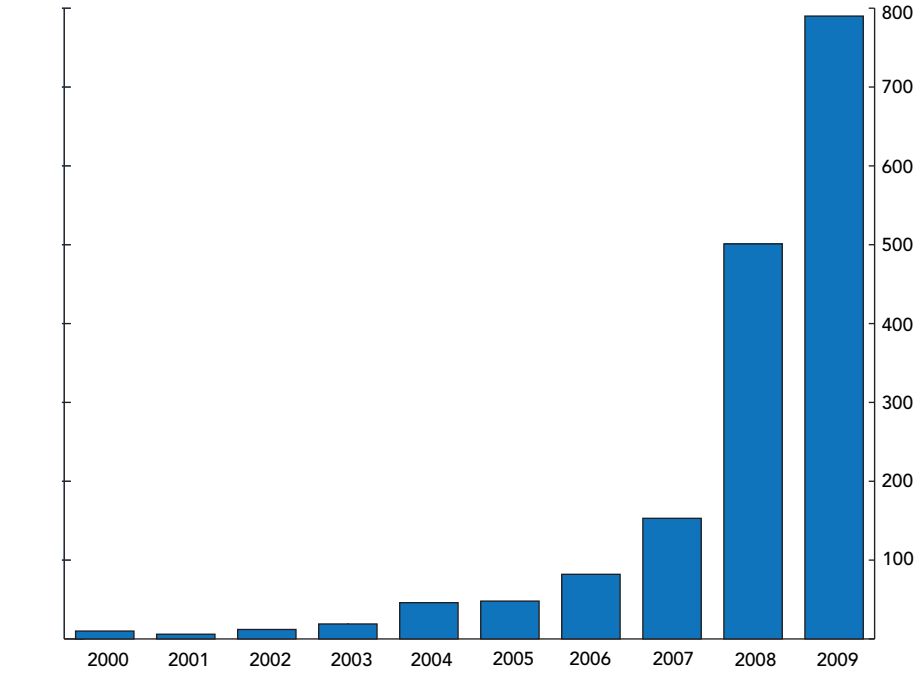
Design for Environment Certified Products

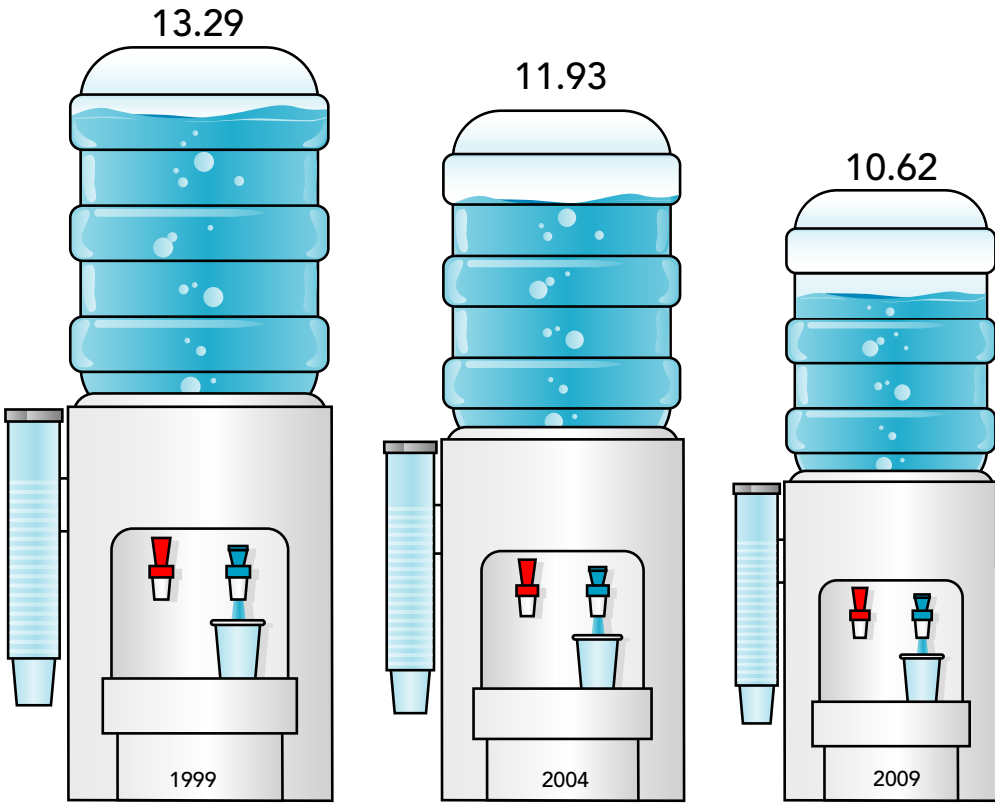
Number certified per year, 2000-2009



Source: U.S. Environmental Protection Agency

Water Intensity

A Rising Tide of Progress



Source: The Freedonia Group

31 percent of companies — including 46 percent of those with revenue over $1 billion — have conducted a water footprint analysis or are in the process of doing so.

— GreenBiz Intelligence Panel, December 2009

For a relatively scarce resource that is only getting scarcer, water use in the U.S. is encouraging. Last year's report found water use per dollar of GDP dropping 25 percent over the course of a decade, and this year's data, collected by The Freedonia Group, shows that despite a slight slowing of the trend, water use continued its plunge, down 20 percent in the past decade.

These findings coincide with the release in 2009 of the U.S. Geologic Survey's five-year report on water use nationally, which found that overall water use in the U.S. has dropped by 5 percent from the highest peak, in 1980 — despite the country's population growing by roughly 80 million in the same timeframe. More telling for the purposes of this report is the fact that industrial water use has dropped by 30 percent since 1985.

The improvements we're seeing come largely from industrial use, energy companies and utilities, and manufacturing and mining processes. The sector with the most consistent increase is municipal utilities, due to growing population — but even there, water use by municipalities is declining per capita.

There are a number of forces driving business to be more water efficient. The rise of water footprinting is one, with an outpouring of efforts from industry, academia and public-private partnerships to develop water-footprinting standards, tools and metrics. But companies that measure their water footprint often find that they're only confirming data they've known for some time.

Water's place in the spotlight is due largely to the sheer number of risks that water issues can pose to a company's well-being. First and foremost are the operational risks from failing to manage water use — for companies in the manufacturing, apparel and food and beverage sectors, tapping out the local water supply can mean having to get out of a market, or even out of business.

A number of companies are leading the charge on water awareness, notably the international beverage giant SABMiller, which in 2009 took the rare step of publishing detailed case studies of its water footprint for two markets. Levi Strauss & Co. has also tracked its water footprint, and now requires its manufacturing partners to comply with a clean-water policy dictating that water used to clean its denim must be cleaned before returning to the watershed.

Awareness is also on the rise among individuals, exemplified by the bottled water backlash in 2008 and 2009, but residential water efficiency and individual awareness is nascent, the next frontier of water efficiency. Some drought-plagued cities are stepping in. Los Angeles — a metropolis in dire need of water efficiency — managed to cut its water use by 17 percent during the peak of the summer of 2009 through incentive programs to homes and businesses alike.

Between corporate efforts to squeeze every wasted drop out of their operations and municipalities urging individuals to do the same, we see the pace of water efficiency as a rising tide, lifting all boats.

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A Nation's Water Footprint

The water footprint of a nation refers to the total amount of water used to produce the goods and services consumed by its inhabitants, expressed as cubic feet per capita per year (m^3/capita/yr). A national water footprint includes two components: the portion that comes from inside the country (internal water footprint) and the part that comes from other countries (external footprint). Below are the footprints for select nations:

Country	Average Footprint (m^3/capita/yr)	External Water Footprint (percent)
Australia	1,393	18
Brazil	1,381	8
China	702	7
France	1,875	37
India	980	2
Israel	1,391	74
Japan	1,153	64
Russia	1,858	16
South Africa	931	22
United Kingdom	1,245	70
United States	2483	19

Source: waterfootprint.org

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