

# STATE OF GREEN BUSINESS 2008

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and the editors of

**GreenBiz.com**

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If one were to rely strictly on the headlines — from the mainstream media, the business press, the blogosphere, and all the rest — it would be easy to conclude that the greening of business practices has reached a tipping point. The daily drumbeat of announcements and achievements has grown in recent years. Hardly a week goes by when there isn't a new development: a corporate commitment, a technological breakthrough, a new partnership addressing environmental challenges, or a new finding from a government agency, university lab, or research group about the progress being made.

Amid the cacophony of developments there is progress, but it's not always obvious or straightforward. And the progress itself can be illusory.

Which led us to ask: What's really going on? Does all of this amount to a sea change in business, or merely a midcourse correction? And, most importantly: Is it actually making a difference to the environment? We set out to find answers.

It wasn't easy. There's insufficient data to show how companies are doing, in aggregate, to move the needle on issues like climate change, toxics reduction, water conservation, and resource efficiency — at least in the United States, the main focus of our inquiry. In a few cases, it's nearly impossible to tell whether indicators of progress are moving forward or backward.

Where we are able to measure, the verdict is mixed: Companies are getting cleaner and more efficient, but only incrementally, and many of the gains are offset by the ever-growing economy. So, while greenhouse gas emissions per dollar of economic activity may be dropping, the growing economy means those emissions are largely unchanged.

Those mixed results notwithstanding, there is much to celebrate. In the pages that follow, we review the past year of trends and developments; present the inaugural edition of the GreenBiz Index, which we'll be updating annually; and proffer our picks on the best books, websites, reports, tools, and headlines of 2007.

The state of green business is improving, slowly but surely, as companies both large and small learn the value of integrating environmental thinking into their operations in ways that align with core business strategy and bottom-line goals. Green business has shifted from a movement to a market. But there is much, much more to do.

— Joel Makower, Executive Editor

It's hard to imagine a more active year in green business than 2007. Except, perhaps, for 2006. And likely 2008, 2009, and beyond, for that matter.

Point is, every year lately seems to be a banner year when it comes to the greening of mainstream business — another 12 months of new and substantive corporate commitments and initiatives, technological breakthroughs, reports and tools, partnerships and consortia, and various other achievements and developments.

How was 2007 different? To answer that, we revisited the more than 1,000 news and feature stories that appeared on [GreenBiz.com](#), [ClimateBiz.com](#), [GreenerBuildings.com](#), and [GreenerComputing.com](#), in pursuit of themes, trends, and movements. We found many. Following, in no particular order, are the top 10.

## 1. Climate Commitments Heat Up

It seems that nearly everyone in business was thinking about climate change, with many companies anxious to make public commitments. Each month seemed to bring another flurry of announcements.

The commitments came one at a time and in clusters, cutting across most sectors of the economy. Some of them were bold. Nike said it would be a climate-neutral company by 2011 — at least, in terms of its facilities, retail stores, and business travel practices. Vermont-based Green Mountain Power Corp. announced that it already was nearing zero-carbon status, with just 2 percent of its fuel mix for 2006 coming from carbon dioxide-emitting sources, compared to the 70 percent for U.S. utilities overall.

Companies weren't merely trying to outdo one another. They were also outdoing themselves, meeting and beating their previously announced benchmarks and re-upping for more. Xerox, for example, announced that it had already met its four-year-old goal of reducing its absolute greenhouse gas emissions by 10 percent by 2012, with 18 percent fewer emissions in 2006 alone, as compared to 2002 levels. It set a new goal to cut emissions 25 percent by 2012 — a 150 percent increase from its previous goal. PPG, having already reduced its emissions by 18 percent of 2002 levels, made a new commitment to reduce an additional 10 percent below 2006 levels by 2011.

Companies also were focusing in on the carbon footprint of specific products and processes. Dole Food Co. announced plans to make its banana and pineapple supply chain carbon neutral, working with Costa Rica's National Forestry Financing Fund to neutralize the emissions from the fruits' production, packing, transport, and distribution to European and North American markets. Cadbury Schweppes and Coca-Cola were among companies that agreed to act as guinea pigs in a U.K. government-backed scheme to calculate the carbon footprint of their products, with the aim of learning how best to communicate the data to consumers.

Companies also banded together to leverage their size and skills to bring more firepower to fighting the climate wars. A group of 10 major corporations

announced a partnership with four leading environmental groups to seek a U.S. cap on greenhouse gas emissions along with a reduction of up to 15 percent within 15 years. By the end of the year, the U.S. Climate Action Partnership had nearly tripled to 28 large member companies, including Alcan, BP America, Chrysler, Dow, Dupont, Ford, General Electric, General Motors, PepsiCo, and Shell. Another new group, Combat Climate Change, a coalition of 46 international companies, pushed governments across the globe to join together for action on climate change. The group released its roadmap and call for action to leaders of the G8+5 countries.

Meanwhile, the Climate Group, the International Emissions Trading Association, and the World Business Council for Sustainable Development launched a new global carbon–offset standard at the London Stock Exchange to increase participation and confidence in the global voluntary carbon market. And AES Corp. and GE Energy Financial Services partnered to develop greenhouse gas emission–reduction projects in the United States. The projects would become the basis for GE’s Earth Rewards credit card, which rewards cardholders’ purchases with offsets produced by the GE-AES partnership.

But there’s a long road ahead. Nearly a third of companies currently have no way of monitoring their own direct carbon emissions, let alone the indirect emissions of their supply chains, and have no plan to begin doing so, according to a new survey of global executives by the Economist Intelligence Unit. Only one in 10 companies said it comprehensively monitors its carbon impact across its entire business, with North American companies trailing their Asian and European counterparts.

## 2. Car Companies Finally Get in Gear

After years of idling, the automobile industry seemed to accelerate its interest in green in 2007. Rising gas prices helped, which spurred consumer demand for smaller vehicles. It didn’t hurt that the U.S. government was able to finally ratchet up fuel-economy standards for the first time in nearly 30 years. And large–fleet buyers steered their way to environmental models. Enterprise Rent-A-Car announced a plan to become the green leader in the rental industry, launching a carload of long-term initiatives, such as a fleet of fuel-efficient and alternative-fuel vehicles, and a commitment to fund research into alternative fuels. New York Mayor Michael Bloomberg revved up a program to replace all 13,000 of the city’s taxis with hybrid vehicles by 2012, following the lead of Boston, San Francisco, and other cities.

There are plenty of reasons for doing so. A report by the Electric Power Research Institute and the Natural Resources Defense Council found that widespread use of plug-in hybrid electric vehicles in the United States could reduce greenhouse gas emissions and improve air quality. Toward that end, General Motors unveiled its Volt electric concept car early in the year, garnering much buzz — albeit cautionary, given that the car was several years from showroom ready. The company also said it could be producing plug-in hybrids by 2010. Toyota said it would partner with the University of California to test plug-ins in the U.S. while

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it does the same in Japan. Ford and Southern California Edison said they will focus on bringing plug-in hybrids to the masses, and Chrysler said it will begin focusing on hybrid and alternative-fuel vehicles.

The next generation of alt-fuel vehicles also began to get rolling. Pacific Gas and Electric Co. and Tesla Motors, makers of a high-flying electric sports car, said they would join forces to explore vehicle-to-grid recharging technology. And the Automotive X-Prize was launched, promising a bounty for the team capable of building at least 10,000 cars per year getting at least 100 miles per gallon of gasoline, or its equivalent.

### **3. The Greening of Transport Gathers Speed**

It wasn't just greener cars that were getting going. So, too, were the means for moving people and stuff by planes, trains, trucks, and ships. Consider the environmental impacts of ocean-going vessels, for example: long the bane of environmentalists because of their dirty fuel and other impacts, yet the means by which two-thirds of consumer goods arrive on U.S. shores. While oceangoing vessels worldwide account for just 2 to 3 percent of global fossil-fuel consumption, they are responsible for 14 percent of the nitrogen emissions from fossil fuels and 16 percent of all sulfur emissions from petroleum, according to a study by Carnegie Mellon University.

One reason: Cargo ships run on "bunker fuel," the dirtiest, cheapest product that remains after gas and other high-grade fuels are refined from crude oil. Bunker fuel contains up to 5,000 times more sulfur than diesel. As a result, according to Bluewater Network, a division of Friends of the Earth, a single container ship emits more pollution than 2,000 diesel trucks.

To stem the tide of emissions, ports in Long Beach and Los Angeles, Calif., said they will implement a program to reduce the emissions and air pollution from the ships and trucks that make these two facilities among the world's most-trafficked shipping hubs. Beginning next September, the ports will require ships to turn off all on-board power systems while at the docks. In addition, the two ports will prohibit the entrance of any trucks built before 1989, when pollution controls began coming installed in big rigs.

Truckers are also changing course, based on pressure from their customers. Wal-Mart, for one, has committed to doubling its truck fleet's fuel efficiency by 2015, thereby preventing the emissions of 26 billion pounds of carbon dioxide. The retailer, which owns the country's second-largest private shipping fleet, already said it will replace 386 big rigs with hybrid versions of the same truck by 2009. Big shippers also are using other means to reduce fuel costs and emissions from trucking. S.C. Johnson has saved over \$1.5 million and reduced greenhouse gas emissions by nearly 2,000 tons through its Truckload Utilization Project, which aims to send out fully loaded trucks in the best configurations possible as a way of maximizing each truck's carrying capacity and shipping route. Meanwhile, a U.S. EPA program called Grow and Go aims to help the trucking industry run trucks on petroleum- and emissions-reducing biofuels.

Consumers, too, are getting into the act, thanks in part to a rating of shipping companies by the nonprofit Climate Counts. It ranked UPS, FedEx, USPS, DHL, and other firms on their operations' climate emissions.

Meanwhile, the greening of major airlines took off. The International Air Transport Association urged the airline industry to embrace environmentally friendly practices. It issued four challenges to drive the industry toward a vision of zero emissions. As part of a newly created Clean Sky initiative, the European government is working with airlines and manufacturers to cut the industry's emissions by 40 percent of present levels in 2015.

#### 4. Green Marketing — and Greenwashing — Make a Comeback

The green marketplace roared back to life, as products making environmental claims became more prevalent, including some from bigger companies. Philips Electronics, Procter & Gamble, REI, Wal-Mart, and Whole Foods announced intentions of selling more green-labeled goods. Home Depot introduced Eco Options, a program that labeled more than 2,500 Eco Options products available in its stores, from insect repellents to front-load washing machines. By 2009, the retailer hopes Eco Options will grow to include 6,000 products.

It won't be an easy road. Consumers expressed skepticism over companies' green claims, calling them "just a sales tactic" and expressing reluctance to pay extra for such products, according to one study. That view was echoed by business leaders, who said that even though companies are greening products of all kinds, buyers are unwilling to pay a green premium. Consumers' skepticism was given credence in a report on "the six sins of greenwashing," which found that the overwhelming majority of environmental marketing claims in North America are inaccurate, inappropriate, or unsubstantiated. After examining 1,018 consumer products bearing 1,753 environmental claims, researchers concluded that all but one made claims that are either "demonstrably false or that risk misleading intended audiences." By the end of the year, the U.S. Federal Trade Commission had announced that it would begin reviewing its environmental marketing guidelines for the first time in a decade.

#### 5. Companies Get Deadly Serious About Toxics

A succession of stories about toxic products from China brought new urgency to an already budding movement to reduce or eliminate the components of everything from toys to Toyotas that are hazardous to people and the planet.

Target was among several retailers to launch plans to reduce the amount of toxic materials in their products. Following a campaign by health and environmental groups, it said it would eliminate or reduce polyvinyl chloride (PVC) from a range of products and packaging, including infant and children's products, shower curtains, and tableware. Sears Holdings, parent of Kmart and Sears & Roebuck, followed suit, phasing out PVC. Wal-Mart, Microsoft, Johnson & Johnson, and Apple announced similar measures. Some measures were the result of shareholder actions, as with Hasbro, whose shareholders filed a

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resolution urging the company to stop using PVC in its products. All told, 13 resolutions aimed at reducing toxics were introduced by investors of major U.S. corporations during the 2007 proxy season, according to the Investor Environmental Health Network.

Cosmetics were also scrutinized, as new studies exposed the high number of toxic ingredients in personal care products. One report, entitled “Beneath the Skin: Hidden Liabilities, Market Risk and Drivers of Change in the Cosmetics and Personal Care Products Industry,” focused on the cosmetic industry’s lack of regulation in the U.S. Another study found that toxic jewelry imported from China could be traced back to U.S. electronic waste that had been shipped to Asian recyclers.

Even the iconic “new car smell” was under attack, a byproduct, it turned out, of bromines, lead, chlorine, and heavy metals used to manufacture automobiles, said the Ann Arbor–based Ecology Center, which compiled the first-ever guide to toxic chemicals in cars. Among models that scored highest on these chemicals were those from Nissan, Subaru, Suzuki, as well as Toyota’s Scion.

## **6. Computing Loses Its Bite**

Amid growing concerns about the energy use and waste–disposal problems associated with information technology — everything from PCs and cell phones to server farms that power the Internet — companies, prodded by regulators and customers, took an increasingly proactive stance. Dell announced that it was ahead of schedule in recovering more than 275 million pounds of computer equipment, at a time when more companies are turning to third-party disposal services. HP similarly said it would surpass its 2007 recycling goal of 1 billion pounds of e-waste. Xerox upped the ante, saying it had diverted more than 2 billion pounds of electronics waste from landfills by reusing and recycling parts and imaging supplies, as well as by instituting a product take-back program. The initiatives saved the company billions, too.

These companies were aided by retailers, such as Staples, Office Depot, and Costco, which offered their sites as collection points for the deposit of electronic equipment by customers and non-customers alike.

IT buyers increased efforts to integrate environmental criteria into their purchasing decisions. The Green Electronics Council launched the Electronic Product Environmental Assessment Tool, a certification program to help institutions buy the greenest computers and monitors possible. Within its first six months, nearly 600 products had been certified and buyers had snatched up 36 million EPEAT–certified computers. Meanwhile, an initiative founded by Google and Intel produced a catalog listing the most energy-efficient computers for businesses and consumers. Even the world’s supercomputers were ranked for energy efficiency.

Interest in energy efficiency was underscored by a Gartner study predicting that the vast majority of U.S. data centers will face energy disruptions in the coming

years and that IT managers can expect to pay hefty energy bills that are in line with the expense of hardware infrastructure. To help big IT users reduce their impacts, IBM announced that it had created the industry's first company-led program to measure and certify energy-efficiency results for data centers.

Energy-efficient data centers became the new must-have for environmentally minded companies. Among them was Citigroup, which revealed plans to build a \$232 million LEED-certified data center in Germany that would cut down on greenhouse gas emissions, save energy costs, and reduce water usage.

## 7. The Big Dogs Flex Their Muscles

The breadth and depth of environmental initiatives from some of the world's biggest companies continues to impress us. In recent years, we've seen General Electric, BP, Dupont, and other behemoths embark on journeys to create new business value from products and services that reduce their, and their customers', environmental impacts.

Over the past year, two more giants have stepped up to the plate. Wal-Mart unleashed a dizzying array of initiatives, beginning the year with a companywide sustainability plan dubbed Sustainability 360, aimed at making environmental concerns central to its business decisions. As part of that initiative, Wal-Mart said it would challenge its employees and suppliers to start thinking about how to eliminate non-renewable energy used to manufacture products the company sells. The company held a sustainability summit of major suppliers, exceeded its goal of selling 100 million compact fluorescent lightbulbs during 2007, and eventually announced it would launch its own brand of compact fluorescent light bulbs. And it worked with major manufacturers of laundry detergent to orchestrate an industrywide shift toward concentrated versions in smaller packaging, reducing both packaging and shipping emissions.

The retailer also announced plans to measure the energy use and emissions of its entire supply chain for seven product categories to find ways to increase their energy efficiency; and to begin scoring its electronics suppliers' sustainability practices in order to offer its customers products that are more resource efficient and less polluting.

Wal-Mart promoted green thinking to its 1.3 million U.S. employees, too, by encouraging them to develop "Personal Sustainability Projects," employee-driven efforts through which Wal-Mart and Sam's Club employees set individual goals to improve their health and the health of the environment. And it began installing solar panels on some of its stores.

Meanwhile, another big dog, Google, launched its own parade of sustainability initiatives. The company has embraced a wide range of environmentally friendly practices. Some of them, like the company's fleet of 32 Wi-Fi-enabled, biodiesel-powered employee shuttle buses, are aimed at attracting and retaining talent as much as at reducing its footprint. But its efforts are far from symbolic. Google accelerated its actions last year to create green innovations that reduce the environmental impacts of its data centers.

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Google also invested in new technologies that could benefit all companies. For example, as the search-engine company completed a massive solar installation at its headquarters, it announced plans to invest hundreds of millions of dollars in developing renewable energy technologies that cost less than conventional coal-fired electricity. It also made a foray into the world of electric cars, launching an initiative to invest \$10 million in companies that help speed up the widespread use of plug-in hybrid vehicles, electric vehicles, and vehicle-to-grid technologies.

All that was left was for the company to declare its intention of going carbon neutral, which it did, announcing a goal of doing so by the end of 2007.

## **8. Green Building Elevates Expectations**

In a year that saw the construction market go from boom to bust, green building was one of the industry's few bright spots. The green market, building for years, began soaring in 2007, as several marquee projects opened their doors and some big-time initiatives were born.

Among the bright green ribbon cuttings of 2007 were the Clinton Presidential Library (LEED Platinum rating), the New York Times Tower in Midtown New York (Gold rating), and the U.S. Federal Building in San Francisco (Gold rating). So prevalent are green buildings in New York City, every one of the more than 50 projects valued above \$25 million now developing in lower Manhattan is being built along environmental guidelines, according to the *Financial Times*.

In this fast-rising environment, green building is becoming less the exception than the norm, embraced by sectors ranging from hotels to health care to housing. Nearly 80 percent of workplace and corporate real estate executives say being more environmentally sustainable is a major issue for today's businesses, and they are willing to pay a premium to achieve it, according to a survey from CoreNet Global and Jones Lang LaSalle. More than half of corporate respondents in the study said they now own, manage, or lease a green property, according to a survey published in *Real Estate Investor* and *Retail Traffic* magazines.

The price premium for green building is shrinking, reducing one of the few remaining barriers to the industry's growth. Indeed, that premium is often overestimated, sometimes significantly, according to a study from the World Business Council for Sustainable Development. Moreover, green building can provide a competitive advantage in a tough market, says a report on energy-saving building technologies from CarbonFree.

Several industry initiatives have promised to give a further push to green-building practices. The Clinton Climate Initiative partnered with Wal-Mart and the U.S. Conference of Mayors to help make energy-efficient building products more affordable. CCI will enable its purchasing consortium to offer cheaper environmentally friendly products to the 1,100 U.S. cities involved in the mayors'

conference. Another Clinton initiative involved some of the world's largest cities, from Bangkok to Berlin, which will benefit from a \$5 billion Large Buildings Retrofit Program aimed at helping reduce energy use and curbing greenhouse gas emissions around the globe.

Where will all this go? A report from market researcher SBI found that the booming green building market will continue its rapid expansion through 2011, more than doubling in size to \$4.7 billion in the next four years. The report predicted that the market for green building materials, which has been growing at a rate of 23 percent annually through 2006, will slow slightly, to a "mere" 17 percent, still at ear-popping heights.

## 9. The Greening of Banks Earns Interest

Banks have been addressing environmental issues for the past few years, the product largely of activist pressures against the financial industry to address lending practices that had supported environmentally destructive activities. Nearly all big banks have signed the Equator Principles, aimed at assessing and managing the environmental and social risks associated with project lending.

Over the past year, banks compounded their interest in the environment by launching an impressive array of initiatives to support clean energy, climate mitigation, green building, and other initiatives. Each major bank, it seems, wanted to outdo the others. HSBC, Europe's largest bank, said it would donate \$100 million over the next five years to four environmental groups working on a range of climate issues. Bank of America said it would direct \$20 billion to help its corporate, individual, and small-business customers take advantage of the business opportunities created by green economic growth. Citigroup upped the ante, saying it would devote \$50 billion in investments and financing for projects that reduce global carbon emissions.

Suddenly, the banks' "toaster wars" of yesteryear seemed almost quaint.

Smaller banks vaulted into action, too. Pennsylvania's M&T Bank said it would offer a new financing program, which includes competitive interest rates and technical assistance, to local governments planning to make energy-saving improvements. San Francisco-based New Resource Bank said it would encourage developers and investors to start green building projects by offering financial incentives like providing more money at a lower cost, higher loan-to-value, and lower interest rates. Charlotte, N.C.-based Wachovia announced its plan to build at least 300 LEED-certified green financial centers by 2010.

Activists didn't exactly withdraw from their watchdog role, however. Rainforest Action Network, the activist group that spearheaded earlier banking changes, called on Citibank and Bank of America to stop lending billions to the coal industry and instead invest in clean energy projects. It labeled the two financial giants the "world's top financiers of dirty energy and climate change" despite the two companies' commitments to address global warming.

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**According to an analysis by Business for Social Responsibility, some 30 companies have committed to carbon-neutral status, including Barclays, HSBC, Interface, Nike, Salesforce.com, and Yahoo!**

## 10. 'Zero' Becomes the New Black

It doesn't seem to be enough these days simply to reduce waste, toxics, energy use, and emissions. Today, the trend seems to be getting to zero — zero waste, zero emissions, zero carbon, and more. A succession of companies have made commitments to zero — some of them more aspirational than specific — to eliminate the bad stuff.

This isn't entirely new. "Zero waste" has been a rallying cry around the world for years. There are now zero-waste alliances around the U.S., as well as in Europe and Asia, promoting manufacturing processes that eliminate waste to landfills or incineration, through source reduction, recycling, and closed-loop processes. Some companies, like Xerox, which set up a waste-free factory in the mid-1990s, have been focused on this for years.

And of course, there's the carbon-neutral trend, as noted earlier. According to an [analysis by Business for Social Responsibility](#) (PDF), some 30 companies have committed to carbon-neutral status, including Barclays, HSBC, Interface, Nike, Salesforce.com, and Yahoo!, though some commitments stretch out to 2020.

But the rush to zero has taken off. Wal-Mart set a goal of zero waste by 2025 in all Wal-Mart and Sam's Club stores. The world's two biggest auto companies are similarly driven. In August, General Motors [certified its eighth assembly plant](#) to reach zero landfill waste status, eliminating more than 7,300 tons a year from its White Marsh, Md., facility. (By year's end, it certified two more plants as zero waste.) Toyota said its [eight European manufacturing facilities](#) have similarly achieved zero-waste-to-landfill status.

Coca-Cola set a goal to recycle or reuse all the plastic bottles it uses in the U.S. market, meaning [zero bottles going to landfills](#). It announced a \$60 million recycling plant that will be the world's largest, to be located in Spartanburg, S.C. The facility will produce some 100 million pounds of food-grade recycled PET plastic for reuse each year.

Even smaller companies demonstrated a zen for zero. In Colorado, the Boulder Outlook Hotel & Suites, which sports a full-service restaurant, 3,800 square feet of meeting space, and 162 guest rooms, is [pursuing a zero-waste goal](#). One innovation: Every guest room features bags for guests to insert their compost-friendly items — food scraps or tissues, for example. And then there's the newly opened Integrated Design Associates' headquarters in San Jose, Calif., a refurbished bank branch, which will be a ["net zero" building](#), one of the first of its kind in the country. The building will generate as much energy as it uses, and will result in no additional carbon dioxide emissions.

It's not just "zero" — it's also "100 percent." Everyone from [IKEA](#) to [AMD](#) is striving to be fully powered by renewable energy in the coming years.

That more or less sums up where green business is headed. Increasingly, half measures just won't do. These days, it's 100 percent or zero — all or nothing.

Facts, it's been said, are better for asking questions than answering them. That is certainly true in this case.

In this inaugural edition of the GreenBiz Index, we set out 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 adopting green business practices to investments in clean technologies.

This was more daunting than we could ever have imagined. The quantity and quality of data on business and the environment is wanting, to say the least. Government agencies, nonprofit groups, academic institutions, and companies themselves have done relatively little to quantify, let alone assess, simple measures of business environmental impact.

Case in point: There is a drought of information about how much water is being used by business and industry. On page 56, we describe this and some of the other indicators we tried to find and create, but couldn't — now part of our wish list for future editions of the GreenBiz Index.

The GreenBiz Index fills some of this information void, though not always to our satisfaction. In many cases, the best available data are two years old, making it difficult to assess the impact of the recent surge in green business practices and commitments. The result is lagging indicators that lag more than we would have hoped.

Moreover, we found several instances where data are being compiled inconsistently, making year-over-year comparisons challenging. This is especially true with federal government data, the collection of which can change from time to time. We did our best to mitigate these problems.

Finally, some data we sought are too new to elicit trends. For example, sales of computers bearing EPEAT certification, which attests to improvements in energy and toxic components, began only in mid-2006. We intend to add this and other indicators over time, once we are able to show trends.

The Index that resulted, we believe, tells a story — a mixed story, to be sure — about how companies are making progress in addressing their environmental impacts, though that progress often is timid or offset by economic growth. But there are also reasons to celebrate. We offer our summary of each indicator via one of three icons, indicating whether companies are making progress ("swimming"), losing ground ("sinking"), or holding their own ("treading").



SWIM TREAD SINK

We look forward to your comments about the Index — and to improving each year its ability to help us ask better questions.

# The GreenBiz Index — Summary

Topics	What We Measured	What We Found	Swim/ Tread/ Sink
<b>Alt-Fuel Vehicles</b>	Corporate fleet purchases of hybrids, electric cars, flex-fuel vehicles, and other alt-fuel vehicles	Creeping along, but fleet sales of AFVs are still negligible	
<b>Building Energy Use</b>	Average energy use per square foot of office space	Holding steady, despite growth of information technology	
<b>Carbon Intensity</b>	Emissions of greenhouse gases per unit of GDP	Slight declines, but far from what's needed	
<b>Carbon Trading</b>	Tons of greenhouse gases reduced	Starting to grow from a standing start, but slowly	
<b>Carbon Transparency</b>	Companies responding to Carbon Disclosure Project	Growing slowly but steadily	
<b>Clean-Technology Investments</b>	Corporate, government, and VC investments	Strong, steady growth, especially from VCs	
<b>Clean-Technology Patents</b>	Patents issued by U.S. Patent Office	Strong growth	
<b>Corporate Reporting</b>	Number of reports from large companies	Growing slowly	
<b>Employee Commuting</b>	Number of employees carpooling or using mass transit	Holding steady, not much growth	
<b>Employee Telecommuting</b>	Number of U.S. teleworkers	Growing very slowly	



Topics	What We Measured	What We Found	Swim/ Tread/ Sink
Energy Efficiency	Energy use per unit of GDP	Continued improvement, though at a slower rate	
Environmental Management Systems	Number of ISO 14001 certifications	Continued slow growth	
E-waste	Percentage of recovered equipment	Recycling is growing, but so is the mountain of trash	
Green Office Space	LEED-certified commercial building space	Strong, steady growth and large-scale long-term planning	
Green Power Use	Renewable energy as a percentage of all electricity generation	Gradually increasing, but gains wiped out by overall electricity growth	
Packaging Intensity	Materials used per unit of GDP	Gradually more efficient, even as economy grows	
Paper Use and Recycling	Paper use and recycling per unit of GDP	Paper use is down while recycling rate is up	
Pesticide Use	Pesticide application per acre	Not much improvement	
Quality of Management	Average sector scores based on Innovest criteria	Gradually improving	
Toxic Emissions	Toxic releases per unit of GDP	Continuing an improving trend	

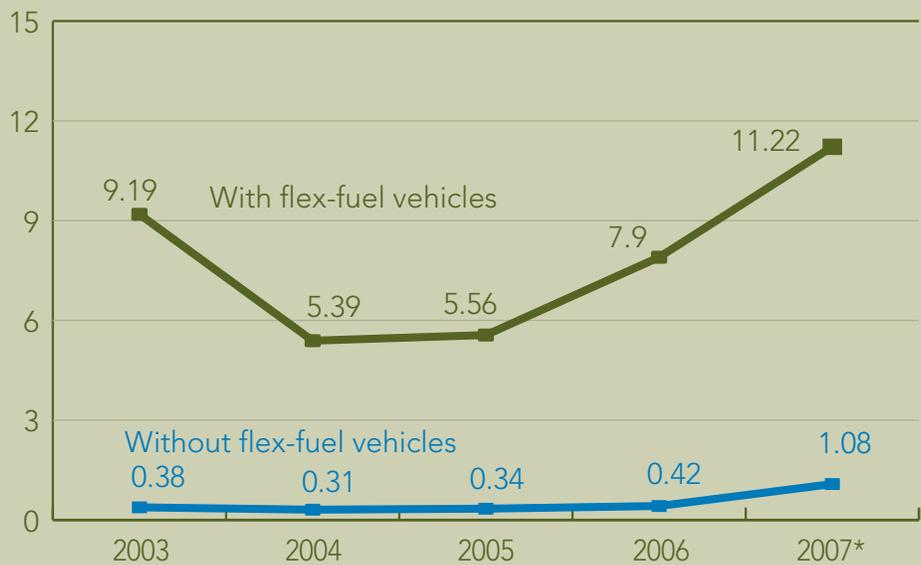


## Alternative-Fuel Vehicles

Efforts to Green Corporate Fleets Are Moving Slowly



Commercial Alternative-Fuel Fleet Vehicles  
Percentage of All Commercial Vehicle Purchases



\*Through November 30, 2007. Includes: new registrations of hybrids, conversions, electric, natural gas and flex-fuel vehicles in private and public fleets. Excludes heavy-duty vehicles, and those running on biodiesel and propane.

Source: R. L. Polk & Co.

Alternative-fuel vehicles (AFVs) are taking an increasing share of the dollars spent on commercial and public fleets, but it's still at a snail's pace. While some companies could benefit financially from a greener fleet, others can't seem to make the business case, or the commitment.

Much like consumers, public and private fleet managers wait for the next best thing that suits their needs and budget. And although tax incentives can offset the cost of buying alternative-fuel vehicles, the infrastructure in most areas of the U.S. needs improvement: there simply aren't enough alternative fueling stations.

New registrations of commercial AFVs nearly doubled between 2006 and the end of November 2007. But at nearly 31,000, they represent only about 1 percent of the more than 2.8 million new commercial vehicles registered during that period.

Largely driving this is the accelerating sales growth of hybrid vehicles. Registrations of new hybrids increased roughly 1,000 percent between 2003 and 2007, while the 288,754 commercial flex-fuel vehicle registrations in 2007 was about 18 percent higher than in 2003. In comparison, the number of new commercial gas-powered vehicles registered in late 2007 remained essentially unchanged from four years earlier.

Though not technically AFVs — they still run on gasoline in addition to electricity — hybrids are attractive for fleets because of the increased driving range and

the fact that they can use the existing fuel infrastructure. By comparison, the limited ethanol infrastructure in the U.S. means that only a small fraction of flex-fuel vehicles on the road actually can use E85, a blend of 85 percent ethanol and 15 percent gasoline. In 2007, there were only about 1,200 E85 fueling stations in the U.S., though that represents a threefold increase from two years earlier. The number should increase even more in light of recent legislation, and with potential big players like Wal-Mart considering adding E85 to its fueling stations.

Our indicator doesn't include commercial vehicles running on propane, natural gas, or biodiesel. Propane, which boasts the largest alternative fuel infrastructure in the U.S., faces quality consistency issues. Clean-burning commercial natural gas vehicles show continuing signs of growth, in large part due to tax incentives that can offset the investment and, in some areas, the attractive price differential compared to gasoline. It's hard to peg the number of heavy-duty vehicles using biodiesel, but between 2004 and 2006, biodiesel production tripled every year.

Alternative fuel vehicles have been part of the commercial sector discussion for the last 20 years. Many companies, especially delivery businesses like Schwan's Home Delivery, FedEx, and United Parcel Service, have experimented with incorporating AFVs into their fleets for decades, while the U.S. Postal Service boasts more than 7,000 non-flex-fuel vehicles. The car rental business is joining in, responding to the small but growing market for green-minded renters. Hertz, for example, launched a Green Collection that features high-mileage and hybrid vehicles. Enterprise Rent-A-Car is bulking up its fleet of rentals with as many as 5,000 hybrids and, with more than 73,000 flex-fuel vehicles, is working to boost the number of E85 fueling stations near its rental locations.

**The aggregate numbers are still small, representing a tiny fraction of the overall commercial fleet — just over 1 percent, not counting flex-fuel vehicles.**

### Large Corporate Alternative-Fuel Fleets

Company	Total AFVs
Schwan's Home Delivery	7,000
Enterprise Rent-A-Car	4,000–5,000
Ferrellgas	3,530
Pacific Gas & Electric Co.	2,441
Florida Power and Light	1,234
Safeway	1,039
Delta Airlines	987
U.S. Grid	962
Waste Management	>867
Alliant Energy	800

Source: GreenBiz.com research, with assistance from *Automotive Fleet*

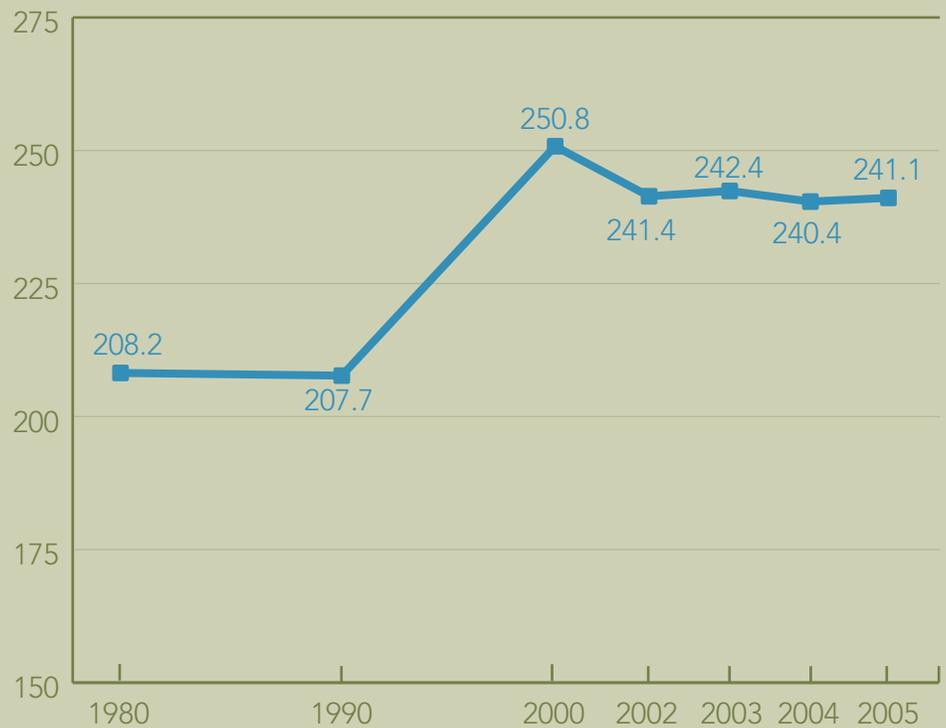
## Building Energy Efficiency

Energy Use and Efficiency Are Rising to New Heights



### Energy Efficiency of U.S. Office Buildings

Energy Use (1000 BTU/square foot)



Sources: U.S. Department of Energy, Building Energy Data Book, and DOE EERE Information Center

Today's office buildings — those architectural icons of the modern age — use about 16 percent more energy per square foot than those of a quarter century ago. This is not surprising when one considers the astronomical rise of computers, servers, copiers, and other energy-consuming wizardry in today's enterprises. Overall building energy use has risen dramatically — about 70 percent since the 1980s — reflecting a 50 percent growth in office space along with the energy growth per square foot.

It could be far worse. Trends in building design — variously called sustainable design, green building, whole-building design, and high-performance building — mean that newer facilities are optimized as systems, rather than constructed as separate pieces inside the same facility. For example, a building that uses extensive daylighting techniques will reduce the amount of heat given off by lighting fixtures, thus allowing for a smaller air conditioning system. This whole-building philosophy considers site, energy, materials, indoor air quality, acoustics, natural resources, and their interrelation.

Energy-efficient buildings also result from improved technology: the steady march of innovation resulting in higher-efficiency lighting, electronics, and office equipment. Local building codes and public-sector mandates at local, state, and federal levels are requiring ever more efficient buildings, creating a bigger market for these new technologies.

Tying these two strands together is a third factor: the rise of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification program for new and remodeled office buildings. LEED is increasingly benefiting from a combination of mandated efficiency codes, increased awareness of the environmental impact of buildings' energy use, and improved technology that is steadily lowering the cost of a high-performance building, which feels the same or better in every way as a conventional facility. And as the numbers show, buildings constructed with these principles in mind are giving us more performance for less energy. (See page 42 for more about the growth of green buildings.)

Yet another factor contributing to the growth of building efficiency is the owners and tenants who must spend their workdays inside these structures. A growing body of evidence has linked more-efficient buildings with improved working conditions, leading to productivity improvements, reduced turnover and absenteeism, and other business benefits. The reason: In most operations, building operating expenses amount to less than 10 percent of an organization's cost structure, while personnel comprise the other 90 percent or so. That means that even small improvements in worker comfort can yield big dividends in performance and productivity improvements.

Despite the progress, there remains a vast inventory of older buildings ripe for retrofitting with more energy-efficient lighting, boilers, heating and air-conditioning systems, windows, and other efficiency improvements. As this older building stock is renovated — or razed for new buildings — we expect that overall building energy use per square foot will stabilize and eventually decline, despite continued growth of the buildings themselves.

**While the total commercial square footage in the U.S. has grown by 50 percent, the energy used per square foot has grown by about one-third that rate.**

## Carbon Intensity

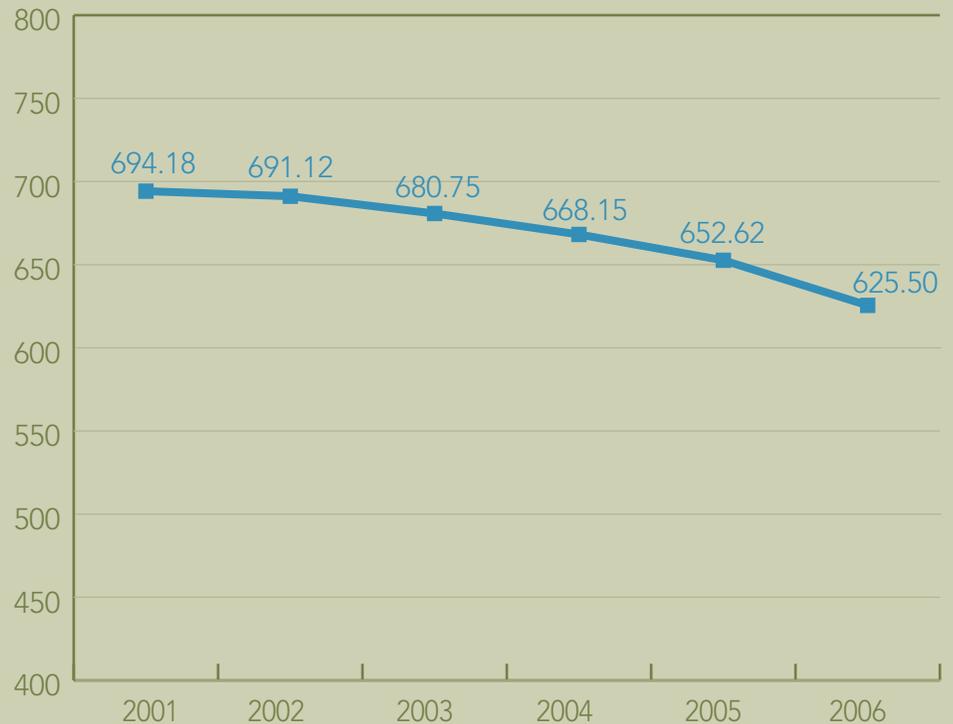
Not Much Improvement, but Getting Warmer



### Carbon Intensity

Million tons of CO<sub>2</sub> equivalent per million dollars of GDP\*

Carbon Intensity



Source: U.S. Environmental Protection Agency

U.S. emissions of greenhouse gases (GHGs) turned the corner in 2006, dropping slightly for the first time since 2001. Total GHGs declined 1.5 percent below the 2005 total — a reduction of 110 million metric tons. The decline was largely the result of a drop in carbon dioxide (CO<sub>2</sub>) emissions, with smaller reductions in other gases, notably methane. The carbon intensity of the economy fell, too. From 2005 to 2006, intensity — measured as carbon dioxide emissions per unit of gross domestic product — fell by 4.2 percent, the largest annual decrease since the base year of 1990.

The industrial sector represented the largest slice of the CO<sub>2</sub> pie, emitting about 36 percent of U.S. greenhouse gases. Following industry were the transportation (28 percent), commercial (18 percent), and residential (17 percent) sectors.

Since 2000, carbon intensity of the U.S. economy has dropped about 12 percent, and almost 28 percent since 1990. Overall emissions rose through 2005, however, due to economic growth, before their slight decline in 2006.

\* All GDP data in this report is from the U.S. Department of Commerce's Bureau of Economic Analysis and is stated in 2000 chained dollars.

Several factors led to the modest decline. For starters, energy consumption, a significant contributor of GHGs, declined by about 0.5 percent in 2006, due in part to favorable weather conditions requiring less heating and cooling. Also, higher energy prices helped to dampen demand. In addition, a greater use of natural gas, a less carbon-intensive fuel, as well as increased use of renewable energy, contributed to the emissions decrease.

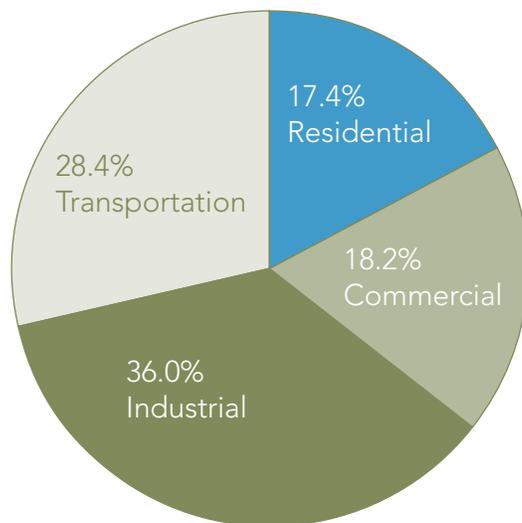
It's a start, though the "carbon gap" remains gaping: The U.S. leads in both overall GHG emissions and per-capita emissions, with nearly 21 percent more carbon emissions per capita than second-place Canada, and roughly double that of Japan.

U.S. government projections show the nation's carbon dioxide emissions rising overall through 2030, increasing by 34 percent over 2006 levels, representing annual growth of 1.23 percent. That will likely represent a continued slowdown of carbon intensity, assuming the U.S. economy continues to grow at 2 to 3 percent annually. In other words, continued modest improvement.

But carbon intensity is misleading. While it represents improvement of sorts, it often obscures the fact that overall carbon emissions need to decrease significantly, not grow more slowly, in order to avoid what a consensus of scientists predict will be the worst impacts of climate change. According to many scientists, greenhouse gases need to decrease a sky-high 80 percent by 2050. At current rates, the U.S. will never get there.

**According to many scientists, greenhouse gases need to decrease 80 percent by 2050. At current rates, the U.S. will never get there.**

### Greenhouse Gas Emissions by Sector



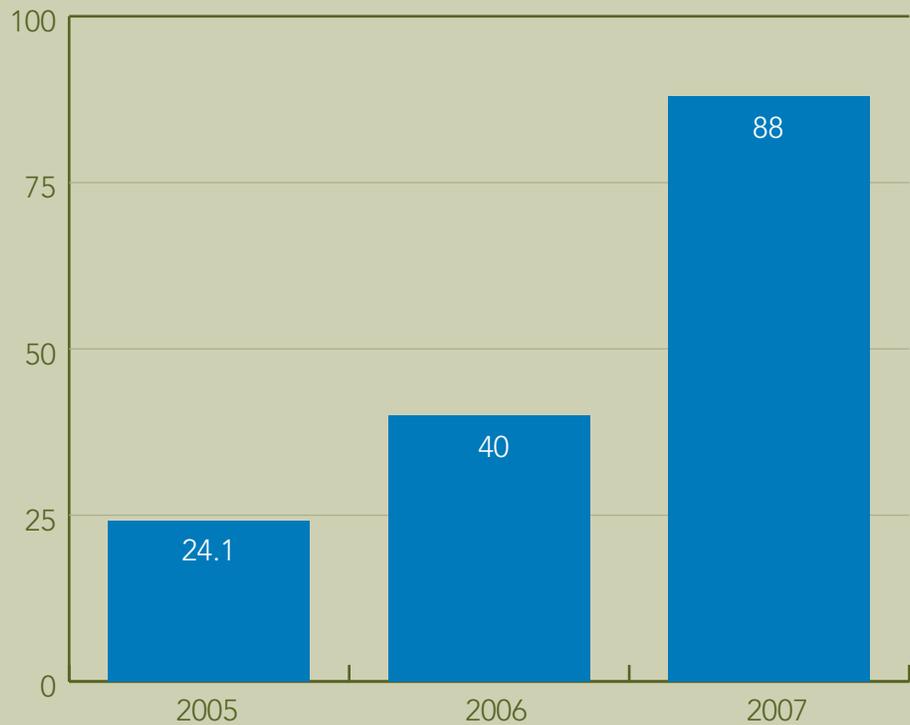
Source: U.S. Energy Information Administration

## Carbon Trading

Just a Blip,  
but Gaining  
Steam



### Emissions Reductions Million Tons of CO<sub>2</sub> Equivalent



Source: New Carbon Finance

The markets for greenhouse gas emissions trading are just getting going, as indicated by the numbers we're tracking — a relative pittance compared to the challenge at hand.

The world of carbon trading is extraordinarily technical and complex, with different systems, each with a set of rules and standards that seems Byzantine to mere mortals. Their common goal is to allow the market to put a price tag on greenhouse gas emissions, thus allowing companies to buy and sell them in order to offset their emissions and meet emissions caps established in many developed countries. All of this emerged from the Kyoto Protocol, a set of binding limitations on emissions of greenhouse gases for developed nations, pursuant to the objectives of the United Nations Framework Convention on Climate Change of 1992. All major developed countries have signed the Protocols, with the notable exception of the United States.

The European Union Emission Trading Scheme (or EU ETS) is the largest multinational, greenhouse gas emissions trading scheme and was created in conjunction with the Kyoto Protocol. It is currently the world's only mandatory carbon-trading program. In addition to the EU ETS, there are voluntary trading schemes, such as the Chicago Climate Exchange, North America's only voluntary, legally binding greenhouse gas reduction and trading system. The exchange has more than 350 members, including major corporations, states and municipalities, universities, and others.

The carbon-trading market has grown considerably, reaching as much as \$70 billion in 2007, according to the International Emissions Trading Association. But trading and emissions reductions are not the same. A single ton of greenhouse gas emissions can be traded many times.

We wanted to assess how much emissions-trading schemes have contributed to reducing greenhouse gas emissions on a global basis. We consulted New Carbon Finance, a U.K. organization that provides analysis of the Kyoto, European, and North American carbon markets. New Carbon Finance's measures cover three markets: the EU Emissions Trading Scheme, the Kyoto Protocol's verified emissions reductions (VERs), and the global voluntary offset market's certified emissions reductions (CERs).

This isn't always an exact science. Some trading schemes, such as that under the Kyoto Protocol, are heavily regulated. Wind farms or landfill gas capture projects must be registered, certified to be actually in operation and producing emissions reductions, then registered with the United Nations, the governing body for Kyoto. But there is no such mechanism in the voluntary markets — no independent body measuring how many projects are actually in operation and generating offsets, as opposed to in the planning stages. New Carbon Finance surveyed the voluntary markets to suss this out.

The resulting data show that 88 million tons of carbon dioxide or its equivalent were reduced through trading in 2007 — a mere blip on the screen, but a start. (Those 88 megatons are equivalent to the amount of CO<sub>2</sub> added by human activity to the atmosphere in just six hours, according to one estimate.) Kyoto's requirements kick in during 2008, expanding the types of emissions reductions that can be counted under the scheme, so it's likely that these numbers will grow manifold in the coming years.

How much of a difference will all of this make? No one we talked to seems to know with any certainty. If all goes according to plan, the markets will set a price for carbon that will lead to changes in investments and the structure of economies, all aimed at moving toward a less carbon-intensive world.

But for now, it's only a plan.

## Carbon Emissions Reductions

Trading Scheme	Reduction Type	Reductions (MtCO <sub>2</sub> e)		
		2005	2006	2007
EU Emissions Trading Scheme	Abatement by facilities covered by EU ETS	20	10	1
Kyoto Protocol	Issued CERs	0.1	26	77
Voluntary market	Traded VERs	4	4	10
<b>Total</b>		<b>24.1</b>	<b>40</b>	<b>88</b>

Source: New Carbon Finance

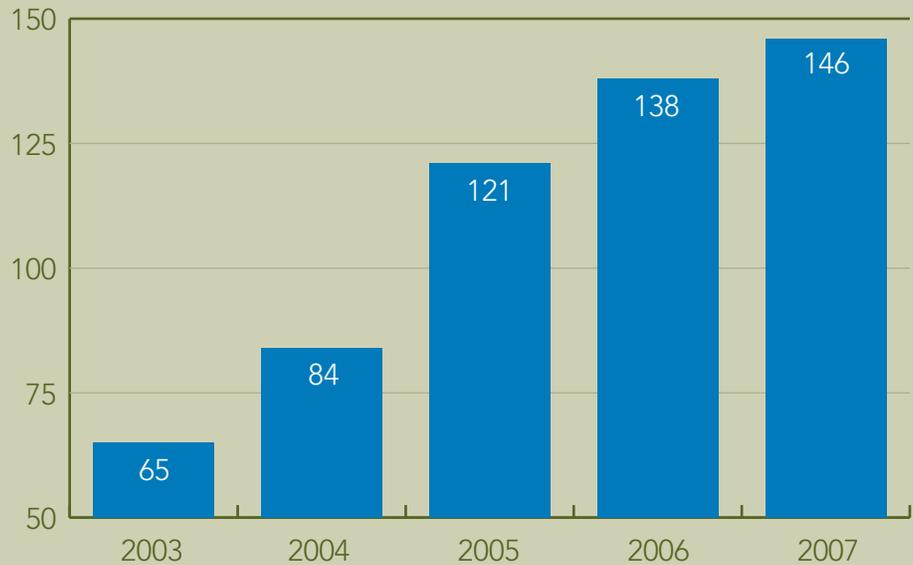
**The 88 megatons reduced through trading are equivalent to the amount of CO<sub>2</sub> added to the atmosphere in just six hours, according to one estimate.**

## Carbon Transparency

Increasing Openness to Disclosure



### U.S. Companies Responding to Carbon Disclosure Project



Source: Carbon Disclosure Project

Large companies are being pressed by investors and activists to provide detailed accountings of their greenhouse gas emissions, as well as the risks and opportunities therein. Investors are concerned about the risks and opportunities associated with changes in temperature and weather patterns, for example, as well as from impending taxation or regulations intended to limit emissions of carbon dioxide and other gases. Many companies also will be buffeted by changes in consumer preferences and demands resulting from increased awareness of climate change risks.

How are U.S. companies doing? We chose to track their responses to the annual request for disclosure made since 2003 by the nonprofit Carbon Disclosure Project. CDP is the coordinating body for more than 300 institutional investors with a combined \$41 trillion of assets under management. On their behalf, it seeks information on the business risks and opportunities presented by climate change and greenhouse gas emissions data from the world's largest companies: 2,400 in 2007. The CDP website ([www.cdproject.net](http://www.cdproject.net)) is the largest repository of corporate greenhouse gas emissions data in the world, all freely accessible.

We gleaned the number of responding U.S. companies from CDP's annual request for disclosure from the U.S. components of the FT500, a listing of the world's largest companies. Since CDP's first report, in 2003, U.S. companies have comprised a growing percentage of CDP responses, rising from 27.7 percent of the FT500 to 38.1 percent in 2007. This is an encouraging trend.

Of course, a count of CDP responses indicates quantity, not quality. The act of disclosing one's climate risks and opportunities doesn't ensure that the information provided is comprehensive, let alone accurate. In a few cases, companies responding to CDP don't provide any emissions data.

CDP breaks out responses by continent, not by country, so its geographic comparisons are for North America, not the U.S. In that vein, CDP's 2007

report notes that North America led other regions in the growth of companies providing emissions disclosure.

Starting in 2006, CDP also broke out the S&P 500 companies, Standard & Poor's index of 500 leading companies in the U.S. economy. Comparing the S&P 500 with the FT500 offers a decent benchmark between American companies and the larger global business community.

In 2007, S&P companies were just as likely (81 percent for S&P vs. 80 percent for FT500) to say they consider climate change to represent commercial risks, though less likely (69 percent vs. 82 percent) to say they consider climate change to represent commercial opportunities. Sixty-five percent of responding S&P companies disclosed their greenhouse gas data, compared with 79 percent of the FT500. S&P companies were also significantly below FT companies in allocating board-level or upper-management responsibility for climate change-related issues (50 percent vs. 64 percent); to consider emissions trading opportunities (36 percent vs. 46 percent); and especially to implement emissions reduction programs with targets (29 percent vs. 77 percent).

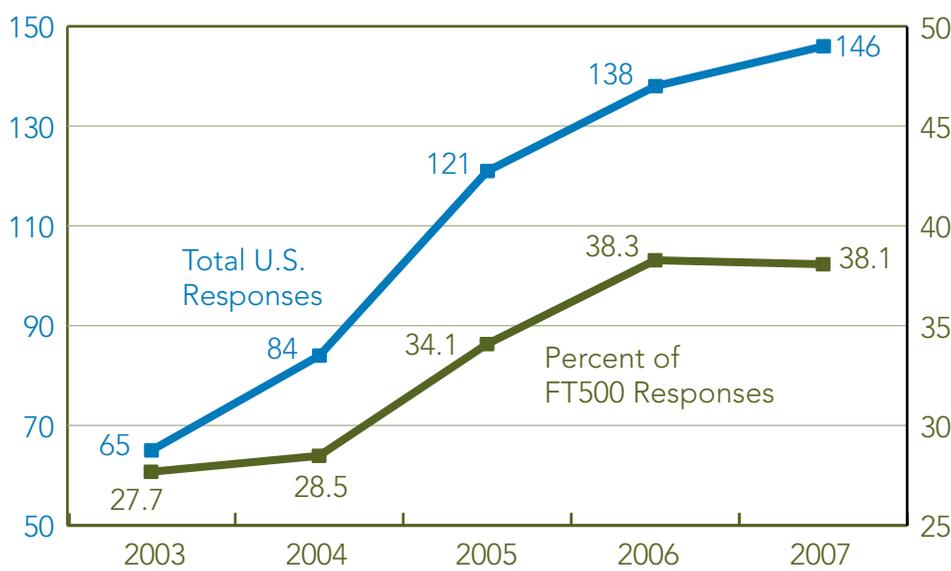
All of this is becoming increasingly material to the mid- to long-term success of a wide range of companies. "Disclosure is important because investors simply need to know who is going to make money out of this and who is going to lose money," says Paul Dickinson, CDP's chief executive officer. Climate emissions, for all intents and purposes, represent inefficiencies — opportunities to improve operations, reduce risks, and save money, not to mention be seen as a leader in the eyes of employees, recruits, customers, and others. In that light, well-done climate disclosure is hardly an end unto itself, but the beginning of a continuous improvement cycle — an opportunity to discover ways not just to be a better corporate citizen, but also to be a better business.

## Corporate Disclosers

These FT500 companies have disclosed information to the CDP for all five years:

3M  
Alcoa  
Allergan  
AIG  
Applied Materials  
Bank of America  
Baxter International  
Boston Scientific  
Bristol-Myers Squibb  
Cisco Systems  
Citigroup  
Coca-Cola Company  
Colgate-Palmolive  
ConocoPhillips  
Danaher Corporation  
Deere & Company  
Dow Chemical  
Duke Energy  
DuPont  
Eli Lilly  
EMC  
Energy  
Exelon  
Exxon Mobil  
Gap  
General Electric  
General Mills  
Hewlett-Packard  
Intel  
IBM  
Johnson & Johnson  
Kimberly-Clark  
Lockheed Martin  
McGraw-Hill  
Merck  
Merrill Lynch  
National City  
Nike  
Occidental Petroleum  
PepsiCo  
Pfizer  
Praxair  
Procter & Gamble  
Schering-Plough  
Schlumberger  
Southern Company  
State Street Corporation  
Texas Instruments  
United Parcel Services  
United Technologies  
Wells Fargo & Company  
Wyeth

## U.S. Companies Responding to Carbon Disclosure Project



Source: Carbon Disclosure Project

STATE OF  
**GREEN  
BUSINESS**  
2008

# Clean-Technology Investments

Big Dollars for Small Start-ups



## Clean-Technology Investment

\$US billions

Year	Corporate	Government	Venture Capital	Total
2004	\$19.67	\$22.50	\$0.74	\$42.91
2005	\$19.79	\$23.39	\$0.99	\$44.17
2006	\$21.86	\$24.38	\$2.04	\$48.28

Source: Lux Research

Investments in clean technologies are a leading indicator of an economy's progress in moving toward a greener and cleaner economy. The U.S. has long been a leader in clean-tech investments from a wide range of sources, and now those investments are mushrooming.

Governments, corporations, and venture capitalists invested a total of \$14.5 billion in clean technology in 2006, an increase of 13 percent over the previous year. The rise reflected a 12 percent increase in corporate investments as well as a 132 percent explosion in venture capital, according to Lux Research, a consulting and research firm.

There is no official definition of clean technology, but it typically includes a range of technologies that optimize natural-resource use and reduce or eliminate environmental emissions. Experts categorize clean tech in different ways, but generally include energy (renewable and distributed technologies as well as efficiency), materials (recycled or bio-based materials), water (conservation, purification, desalination), transportation (alternative-fuel vehicles), and waste reduction and clean-up (recycling, pollution remediation).

Investments in these technologies are coming from a variety of sources: venture capital funds, corporate research and development budgets, government grants, and other funders. All of these are on the rise, though some data — such as for corporate R&D — are often kept close to the vest for competitive reasons.

Funding from all sources is rising, though none more so than venture capital. VC investments in clean technology by U.S. firms during the first nine months of 2007 (\$2.6 billion) exceeded by about 45 percent the investments for all of 2006 (\$1.8 billion), according to Thompson Financial and the National Venture Capital Association, even though the number of deals during that period was greater in 2006. That speaks to the larger sums that are going into individual deals, a sure sign of the maturing of the technologies and the quality of the management teams exhibited by entrepreneurs. Solar-related technologies got the largest portion of these investments, with large amounts also going into power supplies, pollution- and recycling-related technologies, and wind energy.

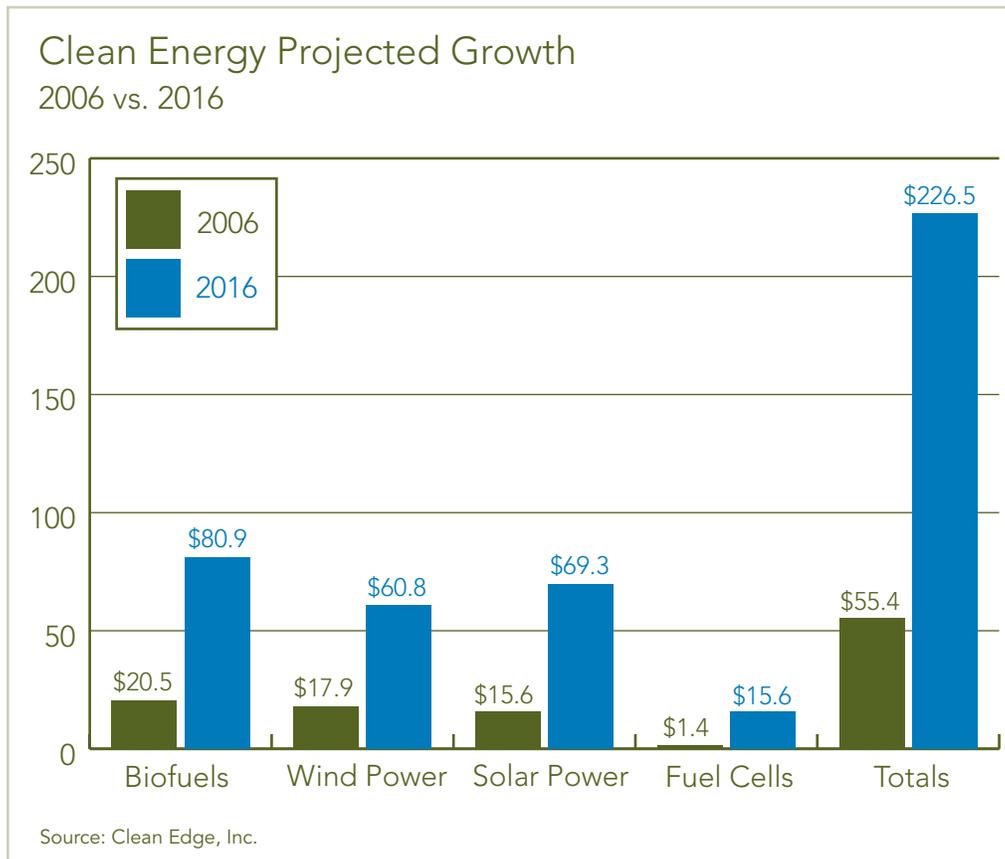
"Much as it leads the world in venture-capital financing in general, the U.S. also leads by a large margin in clean-technology VC investments, even as other parts of the world are arguably more environmentally conscious," says Jaideep Raje, an analyst at Lux Research.

In the U.S., clean-tech R&D is found across a wide range of companies, not just traditional energy and utility firms. The new breed of “energy companies” includes electronics companies (Sharp, for example, is the world’s largest maker of solar panels), biofuels-producing agriculture companies (the CEO of Archer Daniels Midland was previously an executive at Chevron), information-technology companies (IBM, Cisco, Intel, and others are producing chips and software to make appliances and the grid smarter and more efficient), chemical companies (Dupont makes eight of the nine materials typically found in a solar cell), even financial-services companies (Goldman Sachs is one of the world’s largest wind-farm developers). Each of these companies is making sizeable financial bets in energy and other clean technologies.

Federal government investments in clean tech remain stagnate, with an average year-over-year increase of just 1.1 percent between 2004 and 2006, yielding an investment of \$6.24 billion in 2006. Much of this has to do with several initiatives that failed to move through Congress as well as congressional actions that froze fiscal 2005 spending levels well into 2006. These numbers could ratchet up if the political winds in Washington shift toward making energy independence and climate change bigger priorities.

All of this is destined to grow. Clean Edge, a clean-tech research group, predicted in 2007 that markets for just four technologies — solar, wind, biofuels, and fuel cells — would grow fourfold between 2006 and 2016, from \$55 billion to \$226 billion.

**Federal government investments in clean technology remain stagnate, with an average year-over-year increase of just 1.1 percent between 2004 and 2006.**



## Clean-Technology Patents

The Road Is Paved with Good Inventions



### Clean-Tech Patents by Segment

	2004	2005	2006
Energy	2,060	1,993	2,115
Air	218	214	220
Water	130	131	126
Waste	45	58	63
Sustainability	1,409	1,322	1,570
<b>TOTAL</b>	<b>3,862</b>	<b>3,718</b>	<b>4,094</b>

Source: Lux Research

The robust growth of patents for clean technologies, like that of investments in these technologies, is a strong indicator of innovation — the seedlings for growing a lush crop of new technologies, enterprises, and industries.

On a global scale, the United States led in clean-tech patents during 2006 with 46 percent of patents, followed by Asia/Pacific at 30 percent. Europe lagged in third place at 18 percent, according to Lux Research. Specifically, the U.S. Patent and Trademark Office issued 4,094 patents on clean technology for 2006, slightly more than half of which were for energy technologies. Thirty-eight percent were for sustainability-related technologies, with the balance focused on air, water, and waste technologies.

This growth is a continuation of a long-term trend. Clean-tech patents have grown at an average of 5 percent per year since 1995, says Lux, double the rate for U.S. patents overall. In the next two to five years, clean-tech patents are expected to grow more rapidly due to a sharp rise in clean-tech venture capital and other investments.

Energy technologies have been growing quickly since the early part of this decade, when clean-tech venture capital — along with a bevy of conferences, consultants, and publishers — started to come into the field, according to the Clean Energy Patent Growth Index, published by the Cleantech Energy Group at the law firm Heslin Rothenberg Farley & Mesiti P.C.

The highest number of clean-energy patents is found in fuel-cell innovations, which rose from 349 patents in 2002 to 572 in 2006, according to Heslin Rothenberg. This is because fuel cells can be deployed in an wide range of areas, including automobiles, microdevices (such as cell phones and laptops), and back-up power for homes.

Some of this has been spurred by government mandates, such as for biofuels, where patents have revved up in recent years. Over the last six years, a total of 2,796 biofuel-related patents were published in the U.S., with the number increasing by over 150 percent in each of the past two years, according to Ronald Kamis and Mandar Joshi in the Washington, D.C., office of Baker & Daniels. In 2007, the number of biofuel patents tracked by the firm was more than the combined total of solar power and wind power patents.

This bodes well for the industry, given the high likelihood of carbon regulation that would spur innovations in energy, fuels, transportation, and other sectors. Should new laws come to pass, all of this could accelerate, though continued steady growth of clean-tech patents is likely regardless of whatever government mandates come along.

### Clean-Energy Patents, by Type

	Wind	Solar	Hybrid or Electric Vehicle	Fuel Cell	Hydro- electric	Tide or Wave	Geo- thermal	Biomass/ Biofuels	Other	Total
<b>2002</b>	42	162	144	349	6	9	2	12	9	723
<b>2003</b>	49	156	122	464	5	11	5	24	3	824
<b>2004</b>	72	124	98	551	8	18	8	16	4	884
<b>2005</b>	92	104	101	501	7	11	6	14	3	827
<b>2006</b>	109	95	105	572	8	18	5	13	5	917
<b>2007*</b>	133	93	115	512	4	15	5	29	3	889

\*First three quarters only.

Source: Heslin Rothenberg Farley & Mesiti, Clean Tech Group

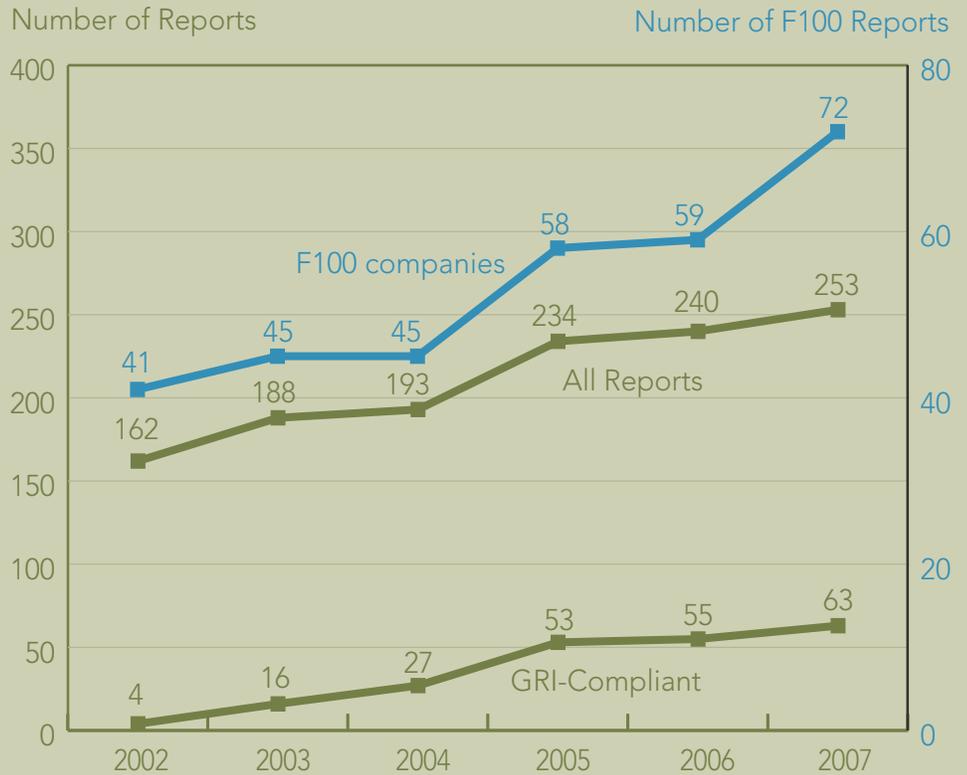
**The highest number of clean-energy patents is found in fuel-cell innovations, which rose from 349 patents in 2002 to 572 in 2006.**

# Corporate Reporting

No Accounting for Limited Growth



## Corporate Social Responsibility Reports Reporting by FT500 Companies



Source: CorporateRegister.com

They go by many names — sustainability reports, corporate social responsibility reports, environmental reports, citizenship reports. And each is a little different from the others. By any name, corporate reporting has gone from “nice to do” to “need to do” in some sectors. The reason: Customers, investors, and stakeholders are demanding increasingly greater accountability and transparency from companies on environmental and social issues. They want to know what companies are, and aren’t, doing, warts and all.

Indeed, in some sectors, it is no longer sufficient simply to publish such a report. Stakeholders are pressing companies to produce reports that comply with the guidelines of the Amsterdam-based Global Reporting Initiative (GRI), whose sustainability reporting framework sets out the principles and indicators by which

companies are to measure and report their economic, environmental, and social performance. About a fourth of all reports published in 2007 hewed to GRI's guidelines.

But the overall number of CSR reports, as tracked by CorporateRegister.com, a global registry of resources on corporate social responsibility, remains relatively low — only 253 companies in 2007, barely a 50 percent rise in five years — though more than two-thirds of Fortune 100 companies published reports. That leaves a great deal of room for improvement.

Corporate social responsibility reporting sprung from the realization that there was a significant information gap between corporations and external stakeholders. GRI, the brainchild of Allen White, vice president of the Tellus Institute, and Robert Massey, former president of Ceres, was meant to serve as a framework for social and environmental reporting similarly to the generally accepted accounting practices that govern almost all financial reporting. The goal was to create a standardized way for companies to report environmental and social data.

The original GRI guidelines had 18 more core indicators than the current version, some of which were combined for a more streamlined framework. Many recognized the need to work on a sector basis to develop unique indicators addressing specific concerns of various industries, leading to the emergence of sector-specific reporting guidelines, such as for mining and telecommunications.

Initially, companies largely focused on environmental, health, and safety indicators because those were areas where regulations already required disclosure. But the GRI forced many corporations to look more broadly at other areas of corporate policy and performance, such as product responsibility, supply chain issues, sourcing, governance, diversity, and social issues.

Corporate reports in general have become useful tools for companies to engage with their stakeholders in setting goals and measuring progress. From an internal perspective, they offer corporations the opportunity to benchmark their performance against their peers and competitors, as well as engage their employees. Their ability to communicate progress also makes them increasingly important tools in recruitment.

Expect to see more companies disclosing more information. As climate change matures into a business issue, companies — especially those with significant fossil-fuel use — will likely increase reporting of the financial and competitive implications of a warming planet. And as climate continues to rise in importance, other types of reporting, from “nutritional”-style product labeling to corporate blogs, are likely to spring up to supplement more formal reports.

## Stalwarts and Newbies

These Fortune 100 companies have filed reports every year since at least 2002:

- Alcoa
- Citigroup
- Dow Chemical
- Exxon Mobil
- Ford Motor
- Hewlett-Packard
- Intel
- Johnson & Johnson
- Morgan Stanley
- Motorola
- Procter & Gamble
- Sunoco
- United Parcel Service
- United Technologies
- Washington Mutual

These large companies filed their first reports in 2007:

- American Express
- American International Group
- Best Buy
- Boeing
- Goldman Sachs Group
- Lehman Brothers Holdings
- News Corp.
- Sprint Nextel
- Sysco
- Travelers Cos.
- UnitedHealth Group.

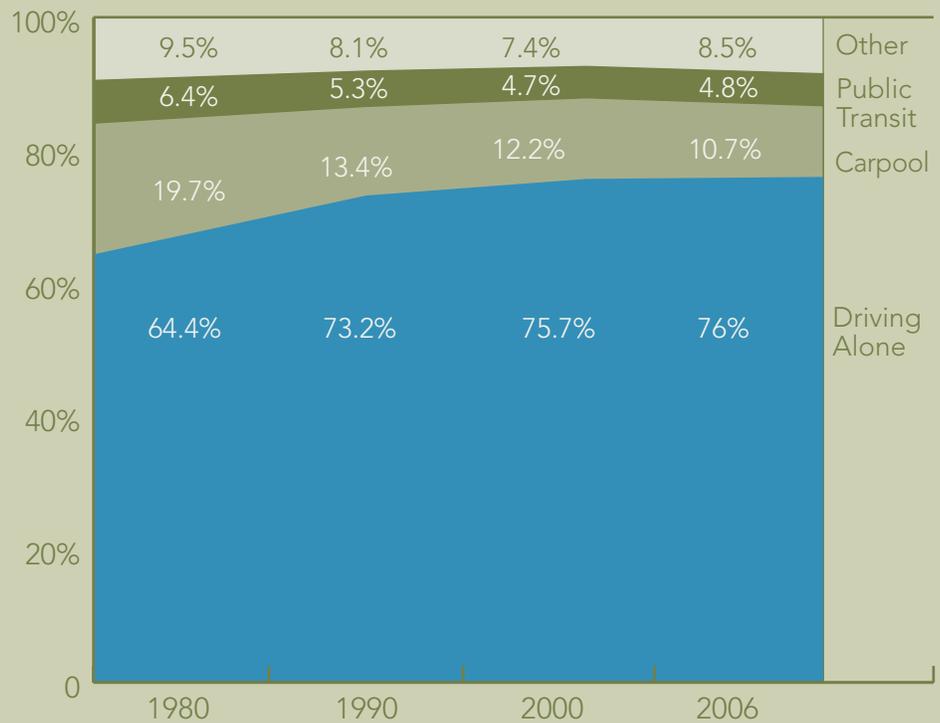
Source: CorporateRegister.com

## Employee Commuting

Efforts to Ramp Up Carpooling and Mass Transit Are Gridlocked



How Americans Get to Work  
Mode of Commuting, by Percentage



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

American workers seem to be on a slow road to work.

The dominant trend in worker commuting since World War II has been the rise of the single driver, fueled by the influx of women and baby boomers entering the job market, automobiles becoming more affordable, and the migration of households and workplaces to the suburbs. This trend has largely reached a dead end: The number of single drivers has stabilized and even dipped a bit in some areas between 2005 and 2006.

Yet there are a number of factors that could keep commuters driving alone. For one thing, workers have come to value the fastest method of getting to work, rather than the cheapest — and the fastest method for many is to drive, even though the average American commute time continues to creep up annually, to 25 minutes in 2006, according to the U.S. Census Bureau's annual American Community Survey.

Another factor promoting solo driving is the design of most public transit systems, such as bus, train, and subway networks. In many regions, they resemble a hub-and-spoke model, with the city in the center and transit lines branching out into the suburbs. But a majority of U.S. workers these days live in one suburb and work in another, creating a different model, which can be difficult to serve by public transit. High housing costs force some employees to live increasingly farther from work, sometimes commuting two hours or more each way to get the housing they want or can afford.

Personal errands also affect commuting trends, as workers stop at the grocery store or daycare to or from work, making public transit or carpooling less attractive or feasible.

Demographics could exacerbate this. Just as tens of millions of boomers affected commuting trends with their entrance into the job market, their departure for retirement could spark new patterns; as employers try to fill their positions, they may need to recruit talent from increasing distances.

Overall, carpool rates have been declining since the early 1980s, when nearly 20 percent rode to work in groups. Large carpools, comprised of three to six people and created largely for purposes of cutting costs, collapsed in the 1990s as the value of time grew in importance. But two-person "fampools," as coined by commuting expert Alan Pisarski, have remained constant. And some experts point to a mini-renaissance in carpooling, influenced in some locations by immigrant workers entering the workforce. Carpooling, for instance, is more prevalent in Hispanic households.

Public transit has seen its own renaissance of sorts since the price of gasoline began its steady rise during 2007. Americans took nearly 50 million more trips on public transit in the third quarter of 2007 compared to the year before, as the average price of a gallon of gas reached \$3.10 for regular unleaded, a 32 percent growth.

The move to separate drivers from their cars could gain some momentum as high fuel prices and growing awareness of climate change prompt drivers to abandon their cars, if not their commutes. And a growing number of employers, recognizing that less-stressed employees are happier, more productive, and more likely to stick around, offer benefits that allow workers to use a portion of their pre-tax salaries to pay for mass transit. About two million U.S. workers take advantage of commuter benefits offered by roughly 15 percent of U.S. companies.

In major metropolitan areas, nearly a third of companies offered such benefits, compared to 19 percent the year before, according to the 2007 Commuter Impact Survey from nonprofit TransitCenter. The survey, based on interviews with 245 human resource professionals, found that 17 percent of respondents planned to introduce the tax-free benefits, compared to 5 percent a year earlier.

## Best Workplaces for Commuters

1. Intel
2. Microsoft
3. Google Inc. (tie)
3. Oracle (tie)
5. QUALCOMM
6. Yahoo!
7. Cisco Systems
8. Sun Microsystems
9. Texas Instruments
10. Applied Materials, Inc.
11. Safeco Insurance
12. Reliant Energy
13. Wyeth
14. Apple
15. IBM
16. Advanced Micro Devices
17. EMC Corporation (tie)
17. El Paso Corporation (tie)
17. Nike, Inc. (tie)
20. Schering-Plough

Source: U.S. Environmental Protection Agency

## Employee Telecommuting

Inching Forward,  
Slowly but  
Steadily



U.S. Teleworkers  
Millions of Workers



Teleworking is on the move — albeit at something of a crawl, sort of like driving to work during the morning commute.

A teleworker is defined as someone who spends at least one day a month working from home. It does not include mobile teleworkers, such as so-called “road warrior” business travelers, those working from client locations, or self-employed, home-based individuals. Gartner Inc., which compiles teleworker data, refers to “corporate teleworkers” to distinguish these from the others.

The U.S. teleworker population is growing slowly but steadily, helping to reduce road congestion, energy use, and emissions — or, at least, keep them from getting worse. Each 1 percent reduction in the number of cars on the road yields a 3 percent reduction in traffic congestion, according to the Telework Coalition.

In 2006, more than 33 million Americans logged 8 hours or more per month as teleworkers, and more than 12 million put in 8 hours or more per week, according to Gartner. Those figures are expected to rise for 2007 to 35 million and 13 million teleworkers, respectively, though the rate of growth has hit a wall, with 2007 showing only 4 percent growth, down from 16 percent growth in 2004. The highest proportions of teleworkers are found in New England and the Mountain and Pacific states.

In 2006, North America, Western Europe, and Japan accounted for approximately 75 percent of the worldwide teleworker population. Gartner forecasts that figure will drop to 72 percent by 2011 as the teleworker populations of other regions increase.

The U.S. will have a teleworking penetration of 26 percent of the employee population in 2007, Gartner predicts. In comparison, Western Europe is expected to reach only a 16 percent penetration in the same year, even though the employee population of both regions is similar. In Japan, where the government is driving the trend, the penetration of teleworking into the employee population is expected to approach 20 percent in 2007. In Canada that figure is 12 percent. Less-developed countries are still waiting for a stable communications infrastructure as well as a cultural acceptance of telework.

Since the teleworking movement began during the 1990s, it was seen as a trend initially pioneered to extend the working day, or as a means to achieve a better work-life balance. But employers quickly saw added benefits. A British Telecom study found that the average telecommuter works 11 percent more hours than an office-bound counterpart. It also found that reduced costs for office space and other overhead items save employers an additional amount equal to 17 percent of annual salary costs (not to mention reduced energy use from not having to heat and cool as much building space). The Colorado Telework Coalition reports that American Express's teleworkers produce 43 percent more business than employees at the office. Compaq teleworkers are 15 to 45 percent more productive than their office-bound counterparts. Other studies have found that being able to offer flexibility can reduce staff turnover by up to 20 percent and reduce absenteeism by as much as 80 percent. Encouraging telework also can contribute to a company's efforts to reduce or eliminate its carbon footprint.

Technological improvements also have helped spur teleworking, in particular the rise of broadband communications and VoIP, or Internet-based voice communications. Among its other benefits, VoIP is improving the use of videoconferencing, which traditionally had been expensive and unappealing from an aesthetics perspective. Cisco, for example, holds about 1,000 such meetings a week using its TelePresence videoconference technology. It reports happier, more productive employees, too.

**In 2006, more than 33 million Americans logged 8 hours or more per month as teleworkers, and more than 12 million put in 8 hours or more per week.**

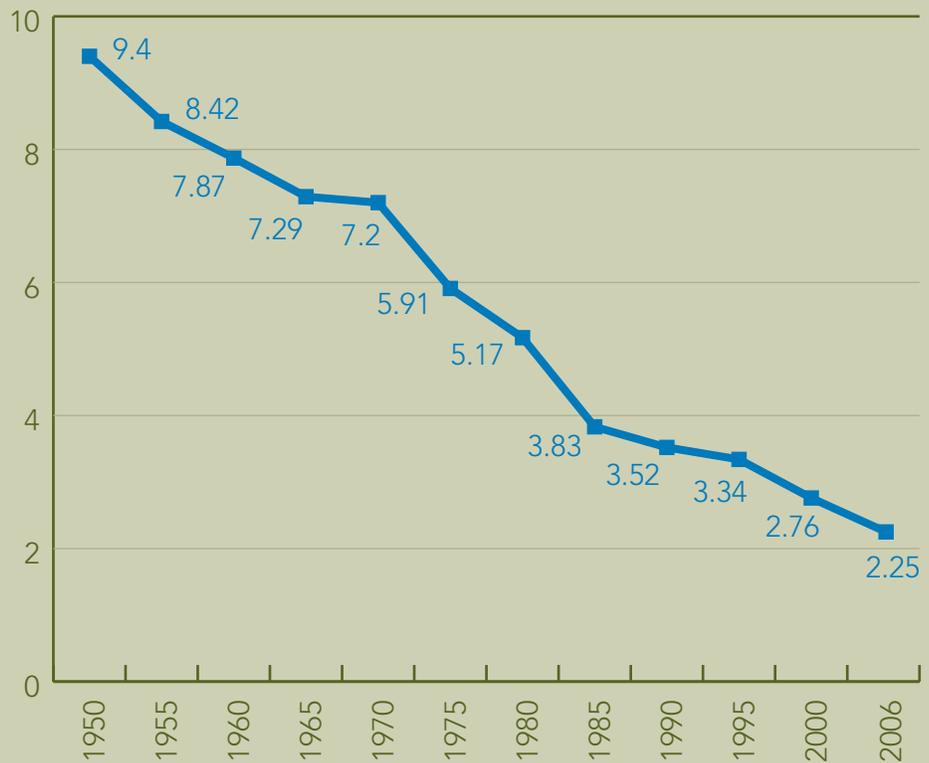


## Energy Efficiency

A Success Story Continues, but Loses Power



U.S. Energy Use  
BTUs Per Dollar of GDP



Source: U.S. Energy Information Administration

Companies have continued their steady march toward more energy-efficient products and processes, continuing a success story that began more than a half-century ago. Since 1950, energy use — measured per dollar of gross domestic product — has declined more than 75 percent, from 9.4 BTUs per dollar of GDP to just 2.5 BTUs. (A BTU, or British Thermal Unit, is a standard unit of measurement used to describe the energy content of fuels.) Included is the energy needed to light, heat, cool, and ventilate buildings, as well as to harvest crops, process livestock, drill and extract minerals, power various manufacturing processes, move equipment and materials, raise steam, and generate electricity. The improvements have been extraordinarily consistent, dropping nearly every year, during booms and busts, Republicans and Democrats, war and peace.

Consider: Aggregate energy use — the total amount of energy used by all commercial and industrial activities in the U.S. — is about the same as it was in 1968, though the economy is now about three times as large.

However, the rate of improvement has slowed somewhat. While American business was remarkably successful at effecting significant, year-over-year gains in energy efficiency, those rates declined beginning in the late 1980s. Some of that may have to do with companies having identified and implemented the easiest efficiency gains — the proverbial “low-hanging fruit.” It also may reflect the overall growth of the U.S. economy. The mid-1980s — the point at

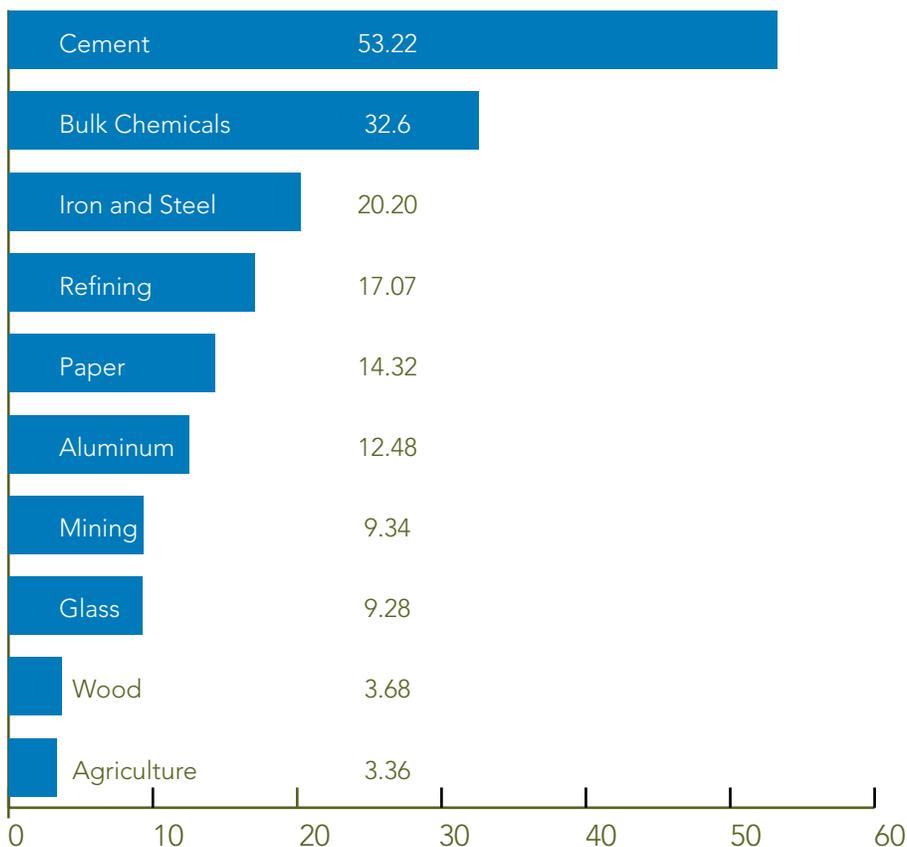
which energy-efficiency gains slowed — marked the advent of the Digital Age, bringing with it an ever-growing number of energy-hungry computers, printers, servers, and other devices. As a result, some efficiency gains have been offset.

Many companies' efforts to reduce the embedded energy in their products and processes mirror the overall economy's trends. For example, yogurt maker Stonyfield Farm has reduced its facility energy use and the associated carbon emissions per pound of product by one-third over the past decade. Xerox said it was able to reduce energy use by up to 22 percent per pound of copier and printer toner. Dow has been able to reduce the amount of energy needed to produce a pound of product by 22 percent since 1994.

The stability of relative energy use is good news, but it is insufficient to address energy and climate challenges. California has demonstrated that much greater efficiencies are possible: Its statewide energy use has remained relatively constant since the mid-1970s, despite its population growing from about 16 million to 36 million. Achieving those kinds of efficiencies will require a combination of economic incentives, competitive pressures, technological improvements, and corporate leadership — or, perhaps, a sharp rise in energy prices, or some other shock to the system.

**Aggregate energy use is about the same as it was in 1968, though the economy is now about three times as large.**

### The Most Energy-Intensive Industries Highest Energy Per Dollar of Products Shipped to Market, 2007



Source: U.S. Department of Energy

# Environmental Management Systems

## Modest Gains for Supply Chains



### Total U.S. ISO 14001 Certificatess



Source: International Organization for Standardization

Environmental management systems may be the least sexy part of a company's efforts to address its environmental impacts, but it's no less important than the activities more likely to garner interest from media, customers, and others. As such, the growth of EMS represents a metric of how companies are adopting systems promoting environmental responsibility.

The International Organization for Standardization developed the ISO 14001 standard for environmental management systems (EMS) in the mid-1990s as a uniform method for companies to track, teach, and improve their environmental performance. ISO 14001 compliance provides a universally understood language for addressing environmental impacts and can result in positive impacts on the bottom line by reducing waste and consumption of energy and raw materials.

The growth of 14001 certifications around the world varies widely. Japan leads the world in certificates and China nearly doubled its participation in the standard, adding 6,159 new certifications in 2006, compared to just 524 new certifications in the United States that year. However, the U.S. remains in the top 10 countries worldwide for 14001 certifications, with 5,585 total certificates, continuing a consistent growth pattern for the past several years.

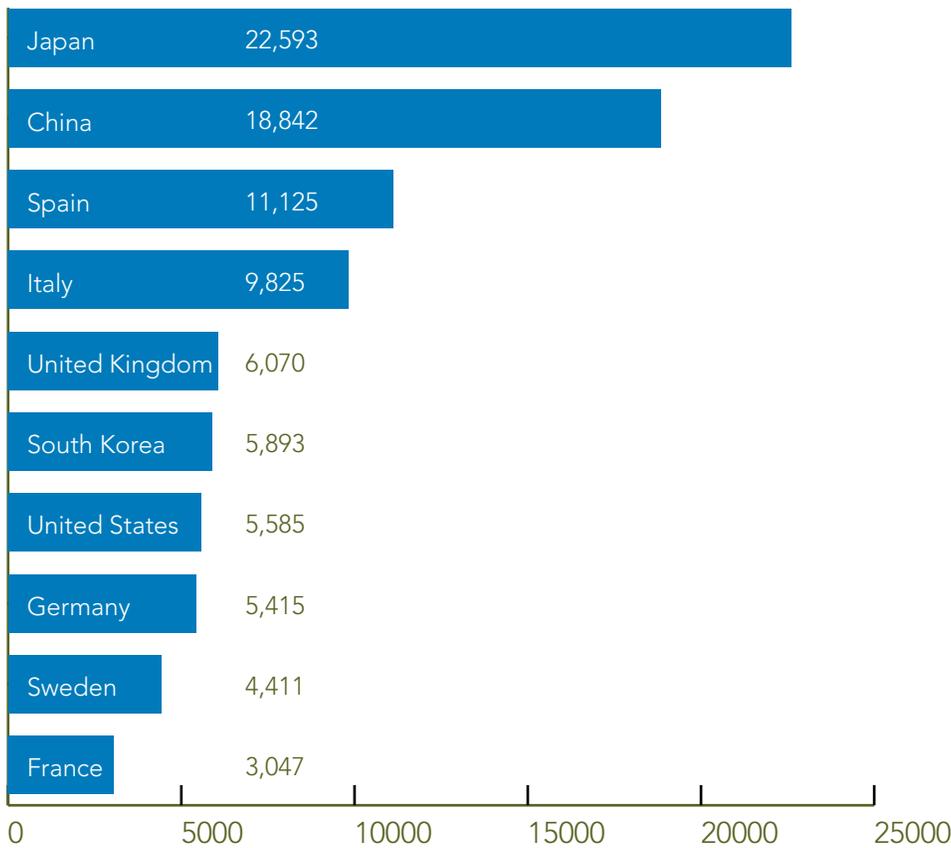
Some multinational corporations require their suppliers to comply with the 14001 standard as a way to ensure a certain level of environmental performance. This requirement is one reason behind the boom in Chinese EMS certificates: As the country where many of the world's supply chains begin, China has become a focal point for companies eager to monitor their overall environmental performance. The global rise in EMS certification is also driven by companies seeking to reduce the negative environmental effects of their activities as a part of good corporate citizenship — as increasingly expected of them by customers, consumers, regulators, and society at large.

As with any standard that aims to cover every industry in every country, there is no one right way to deal with every environmental issue. Instead, a company will set a goal of reducing its greenhouse gas emissions by a certain amount over three to five years, for example, before developing and implementing procedures to meet that goal, and regularly check on progress toward that goal.

Beyond that, an EMS serves as a way to codify practices that might otherwise fall by the wayside. A robust EMS ensures that both new employees and old-timers alike consistently follow a range of procedures that help the company stay in, or get back into, compliance.

**As the country where many of the world's supply chains begin, China has become a focal point for companies eager to monitor their overall environmental performance.**

Top Countries for ISO 14001 Certificates, 2006



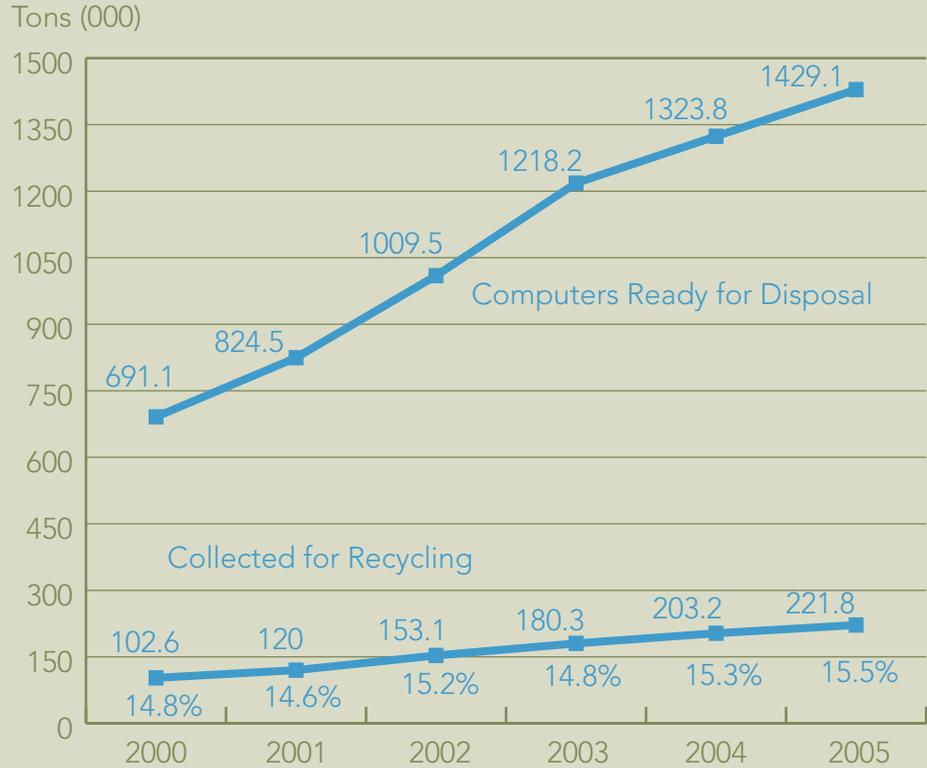
Source: International Organization for Standardization

## E-Waste

### A Hard Drive to Reduce toxic Trash



## Computer Products Discarded and Recycled



Includes personal computers, monitors, mice, keyboards and hard copy peripherals, such as printers, scanners and fax machines ready for end-of-life management.

Source: U.S. Environmental Protection Agency

The growth in the collection and recycling of electronic waste, or e-waste, is gaining slowly, barely outpacing the growth in output of used computers, printers, monitors, servers, and assorted other digital detritus — but in absolute terms, we're getting buried. At least, that's as far as we can tell. The U.S. lacks federal e-waste laws and reporting mandates, making it difficult to get a grasp on the amount of e-waste being recycled in a responsible manner.

First, the good news. About 32 percent of the U.S. is now covered by e-waste recycling laws, compared to 18 percent in 2006. Ten states now have e-waste programs, and up to eight more could follow in 2008. Programs differ in what items they collect and whether they cover households, businesses, or both.

In addition to taking steps to use less-toxic materials in manufacturing, computer and electronics companies are offering take-back programs, in many cases responding to their corporate customers, who need to dispose of old products before buying new ones. This has led to "asset recycling" programs at HP, Dell, and other computer makers. Retailers like Staples and Office Depot have joined in, offering e-waste recycling at many, if not all, of their stores.

It is important to point out that just because electronics are "recycled" doesn't ensure they are handled in an environmentally responsible way. There is no conclusive data on how much e-waste is exported to places with cheap labor

and lax environmental standards, though the nonprofit Basel Action Network estimates that more than half of the recycled electronics collected are exported to developing countries.

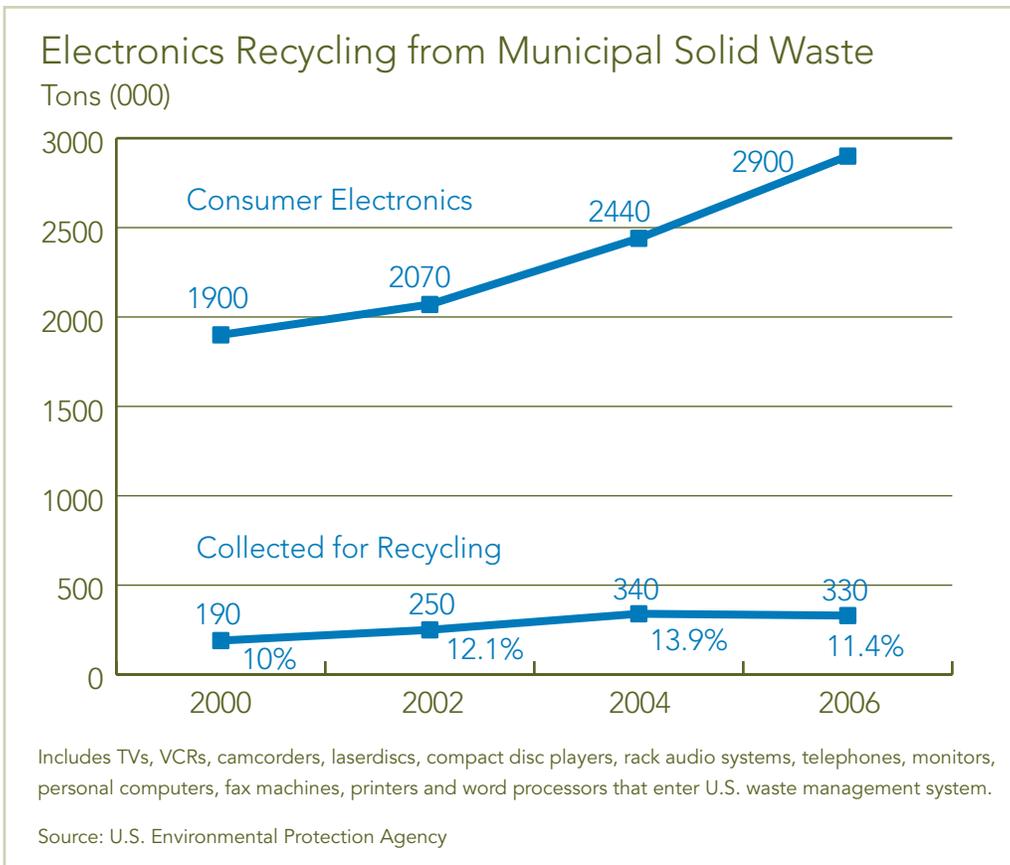
While the number of recycling programs grows, the percentage of equipment captured for recycling remains small, at least from the most recent data.

In our metrics, we considered two measures of e-waste recycling from the U.S. Environmental Protection Agency. One tracks a relatively narrow scope of electronics more pertinent for businesses, such as cell phones, personal computers, televisions and hard-copy devices, such as fax machines and printers. Using market research data on electronics sales, the EPA estimates that roughly 15 percent of computer products are recycled — a figure that has inched up slowly since 2000 — or roughly 32 million units. There's a lot more where that came from: The EPA estimates that in 2005, about 180 million computer products and televisions ready for recycling were sitting in storage.

The second measure from the EPA is for a much broader range of consumer electronics entering the municipal solid waste stream — everything from cell phones to camcorders to clock radios. In 2000, about 10 percent of such electronics were recycled. By 2006, that figure inched up to only 11.4 percent. By weight, e-waste entering the municipal solid waste stream increased nearly 53 percent between 2000 and 2006, according to EPA estimates, while the amount of e-waste recycled during this same period grew nearly 74 percent.

That may seem like progress, but it still leaves almost 90 percent of e-waste getting exported to other countries or ending up in landfills — a veritable mountain of yesterday's technological innovations.

**Almost 90 percent of e-waste is exported to other countries or ends up in landfills.**

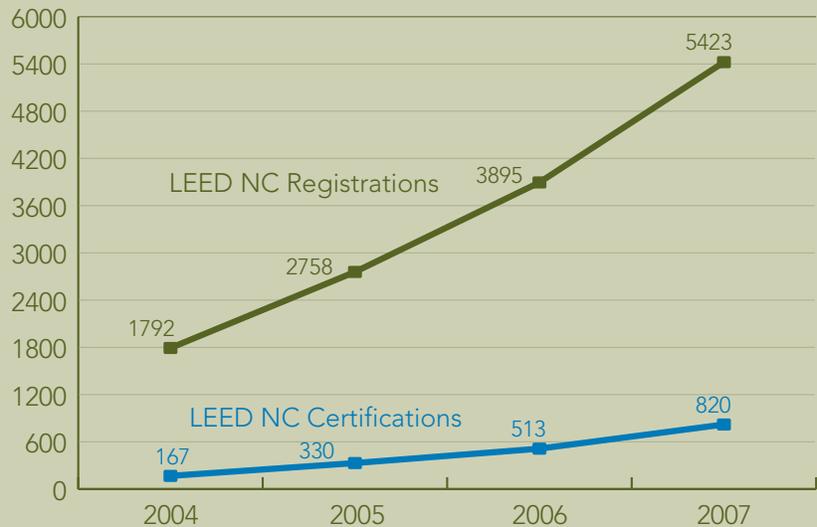


## Green Office Space

More Efficient Buildings Are on the Rise



### LEED – New Construction



### LEED – Existing Buildings and Commercial Interiors



Source: U.S. Green Building Council

Demand and planning for green buildings is rising like a skyscraper on steroids, the product of everything from high energy prices to corporate vanity to a better understanding of the dividends paid by environmentally sensitive facilities.

Two thousand seven may go down as the year that green buildings became a cornerstone of a global strategies to address global warming. With good reason: A recent United Nations report found that buildings are responsible for as much as 40 percent of the world's greenhouse gas emissions.

Architects, designers, and innovators have developed a slew of methods to build commercial and residential facilities that generate as much energy as they use and improve employee health and productivity, all while serving as major corporate image boosters. Witness the star treatment given to green Manhattan skyscrapers like 7 World Trade Center or Bank of America's One Bryant Park.

The principal measures of green buildings are registrations and certifications under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. LEED scores building projects — new and existing, commercial and residential — based on the number of criteria they meet for energy and resource efficiency, use of benign materials, innovation in design, and how well the site fits into larger ideas of sustainable communities.

Three LEED certification categories are most relevant to commercial buildings — for new construction (LEED-NC), for existing buildings (LEED-EB), and for commercial interiors (LEED-CI) — and each has shown similar growth patterns.

Since LEED launched in 2000, the number of certified and registered projects has grown as much as 700 percent a year. At the end of 2007, the square footage of U.S. office and commercial space registered or certified under LEED totaled 2.3 billion, up more than 500 percent from two years earlier. Certified projects are those that have been completed and verified through the USGBC's process, while registered projects are still in the works, whether on the drawing board or nearing completion. The number of registered projects may be more significant than certified projects, as it shows projects in the pipeline, a leading indicator.

The growth in the number of LEED buildings pales when compared to the growth of square footage registered or certified under LEED. Certified and registered LEED-NC projects grew 62 percent and 72 percent respectively, but the square footage skyrocketed more than 500 percent during that same period. LEED-EB projects are also on the rise, and it's likely these numbers will grow on a similar scale as new buildings, aided in part by projects like the Clinton Climate Initiative's Large Building Retrofit project, which in 2007 committed \$5 billion to make existing buildings around the world more energy and resource efficient.

These are the building blocks for much bigger numbers. If the USGBC has its way, the roughly 1,100 LEED-certified commercial projects in existence at the end of 2007 will grow nearly a hundredfold to 100,000 by the end of 2010. Clearly, a groundswell for greener construction is building.

**If the USGBC has its way, the roughly 1,100 LEED-certified commercial projects in existence at the end of 2007 will grow nearly a hundredfold to 100,000 by the end of 2010.**

## Largest LEED-Certified Buildings

Owner/Project Name	Location	Gross Sq. Ft.
Johnson Diversey/Global Headquarters	Sturtevant, Wisc.	2,316,996
State of Illinois/McCormick Place West Expansion	Chicago, Ill.	2,226,000
State of California/Capitol Area East End Complex	Sacramento, Calif.	1,728,702
Silverstein Properties/7 World Trade Center	New York City, N.Y.	1,682,000
Nitze-Stagen & Co./Starbucks Center	Seattle, Wash.	1,650,000
Goldman Sachs/Goldman Sachs Tower	Jersey City, N.J.	1,556,915
General Motors/Lansing Assembly Plant	Lansing, Mich.	1,500,000
General Dynamics/Roosevelt C4 Facility	Scottsdale, Ariz.	1,500,000
Union Investment/111 South Wacker Drive	Chicago, Ill.	1,400,000
LaSalle Street Capital/Abn Amro Plaza	Chicago, Ill.	1,375,058

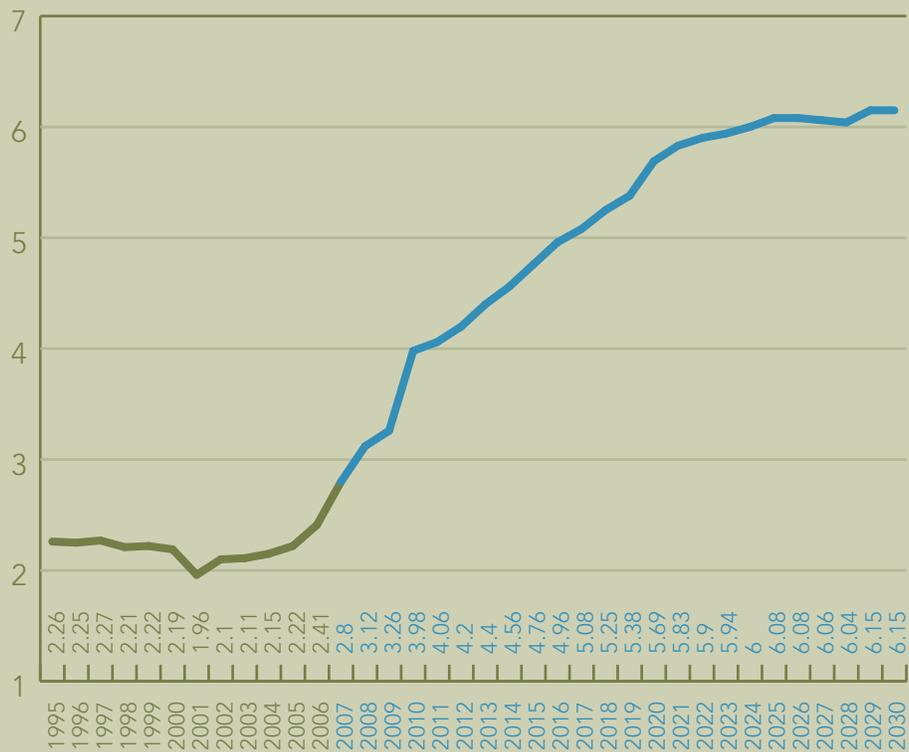
Source: U.S. Green Building Council

## Green Power Use

Generating a Small but Growing Buzz



### Renewable Energy Use Percentage of All U.S. Electricity Generation



Source: U.S. Energy Information Administration

By all accounts, the renewable energy market is aglow. A steady stream of studies and news stories reveals how demand for solar panels and wind turbines has outstripped supply. Product manufacturers have backlogs of orders. Renewables are finally here!

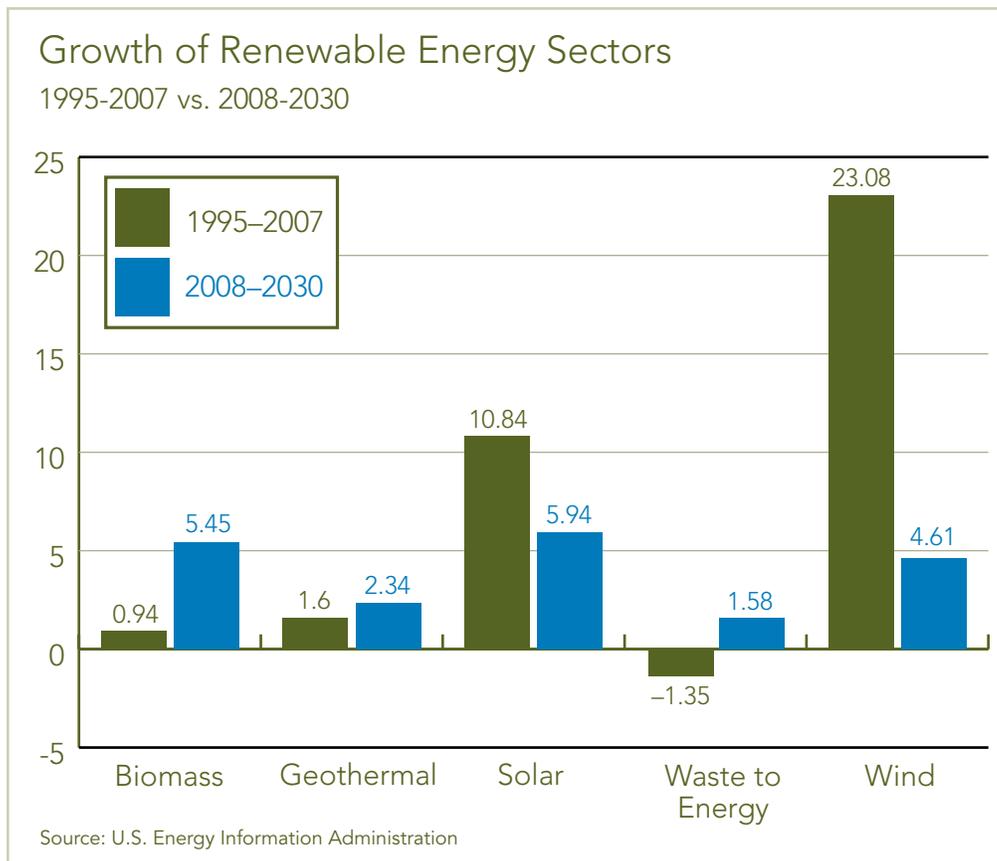
But the reality is that energy from solar, wind, biomass, and geothermal resources represent a tiny fraction of the electricity generated in the U.S. — and the percentage has held fairly steady for the past decade. True, electricity generation from renewables has grown — from about 81 billion megawatt-hours in 2000 to 96 billion in 2006, according to the U.S. Energy Department — but that still represents slightly more than 2 percent of total U.S. electricity generation, about the same percentage as in 1995. The obvious reason: Overall electricity consumption has grown in lockstep with the growth of renewables, requiring more fossil fuel power plants — and making the existing ones work harder than ever.

This is expected to change, according to forecast figures from the Department of Energy, but not by leaps and bounds. If the numbers hold up, electricity from renewable sources will account for more than 3 percent of total U.S. electricity generation in 2008. By 2011, renewables should pass the 4 percent mark, eventually accounting for more than 6 percent of total U.S. electricity generation by 2024. During this period, the growth rate of non-hydro renewable electricity generation will outpace that of overall U.S. electricity consumption. Between 2008 and 2030, renewable electricity generation is expected to enjoy a 4.4 percent compound annual growth rate, compared to 1.2 percent for overall electricity consumption.

That may seem like healthy growth, but it falls far short of climate experts' estimates of the amount of renewable energy needed to offset the need to build more coal-fired power plants in the coming years.

Still, the overall growth rate for renewable electricity generation is estimated to surpass growth of coal and nuclear generation in coming years. Between 2008 and 2030, electricity from coal is projected to grow at an annual compound rate of 1.8 percent; electricity generation from nuclear sources should only grow by just 0.8 percent.

**Renewable energy's projected growth falls far short of climate experts' estimates of the amount needed to offset the need to build more coal-fired power plants in the coming years.**

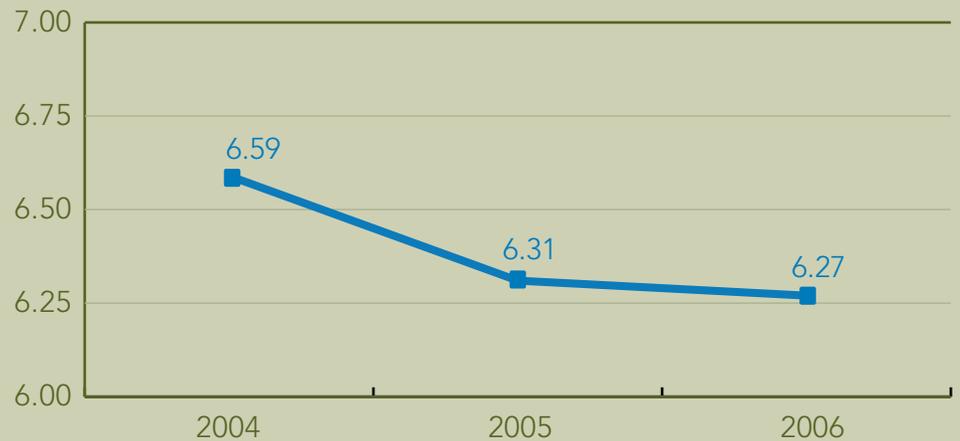


## Packaging Intensity

### Gains from Thinking Outside the Box



Packaging Use  
Thousand Tons per Billion Dollars GDP



Source: GreenBiz.com research. © 2008 Greener World Media, Inc.

In recent years, increased efficiency of packaging use — of aluminum, paper, plastics, and steel — has been modest, keeping pace with economic growth. Our measure of packaging intensity, defined as packaging materials used per dollar of gross domestic product, shows small but continued declines in the past few years, a sign that companies are doing more with less.

That's likely to accelerate, as manufacturers find ways to reduce, reuse, recycle, or eliminate packaging to cut material and shipping costs. Far from being a short-lived response to consumer demand, this is the future of packaging, and it will take center stage in 2008.

It has become nearly impossible to talk about packaging in the U.S. without mentioning Wal-Mart. In 2006, the retail juggernaut announced an ambitious packaging initiative that promised to transform the way its suppliers bottled, wrapped, packed, shipped, and sold their products. The company will begin evaluating its suppliers in 2008, so manufacturers and trade groups are working hard to find solutions.

Some packaging innovations start with the product itself. One example: Wal-Mart encouraged General Mills to straighten out the wavy noodles in Hamburger Helper, reducing packaging needs by nearly 900,000 pounds of paper fiber annually (and creating more available shelf space for Wal-Mart). Overall, Wal-Mart says its packaging goals will reduce carbon dioxide by 660,000 tons by 2013, saving suppliers \$3.4 billion, and will reduce carbon emissions by the equivalent of taking 200,000 large trucks off the road.

It's not just Wal-Mart. Other retailers are pressing manufacturers, too. U.K. retailer Marks & Spencer announced a plan to reduce packaging waste by 25 percent. Kmart, Sears, and Target said they would eliminate or reduce polyvinyl chloride (PVC) from a range of products and packaging.

Largely as a result, companies are working to squeeze more product into less space, and to use fewer toxic or unrecyclable materials in the process.

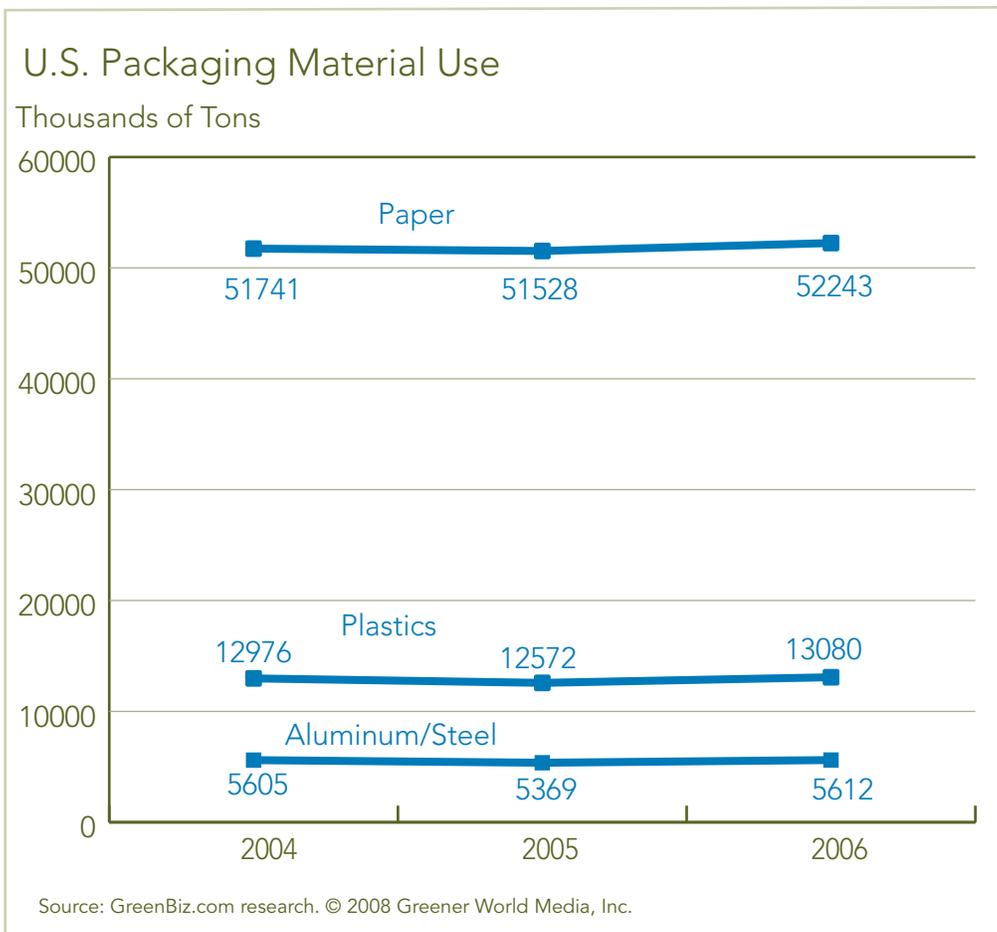
For example, in 2007, Hewlett-Packard phased out PVC from its packaging, Stonyfield Farm switched plastic types and dropped the yogurt lid to reduce materials use by 17 percent, and triple-concentrated laundry detergents blitzed grocery store aisles, from all the major brands.

Across each industry, from steel to plastic, paper to aluminum, the makers of packaging products are simplifying their materials — one prime example is beef jerky packaging, which contains a dozen plys of plastic with 18 different chemicals — reducing packaging size and making use of recycled and recyclable materials.

Companies are finding significant benefits to this shift. Using less packaging lowers costs across the entire supply chain, and incorporating more recycled materials can reduce total waste to boot. Packaging manufacturers are also exploring ways of turning waste into energy, one successful example being paper mills' recovering toxic byproducts and converting them into fuel to power the mill.

Those activities and innovations are just beginning to bear fruit, and we expect to see a continued drop in packaging intensity as companies learn to think outside the box, literally.

**Wal-Mart says its packaging goals will reduce CO<sub>2</sub> by 660,000 tons by 2013, saving suppliers \$3.4 billion, and will reduce emissions by the equivalent of taking 200,000 large trucks off the road.**



# Paper Use and Recycling

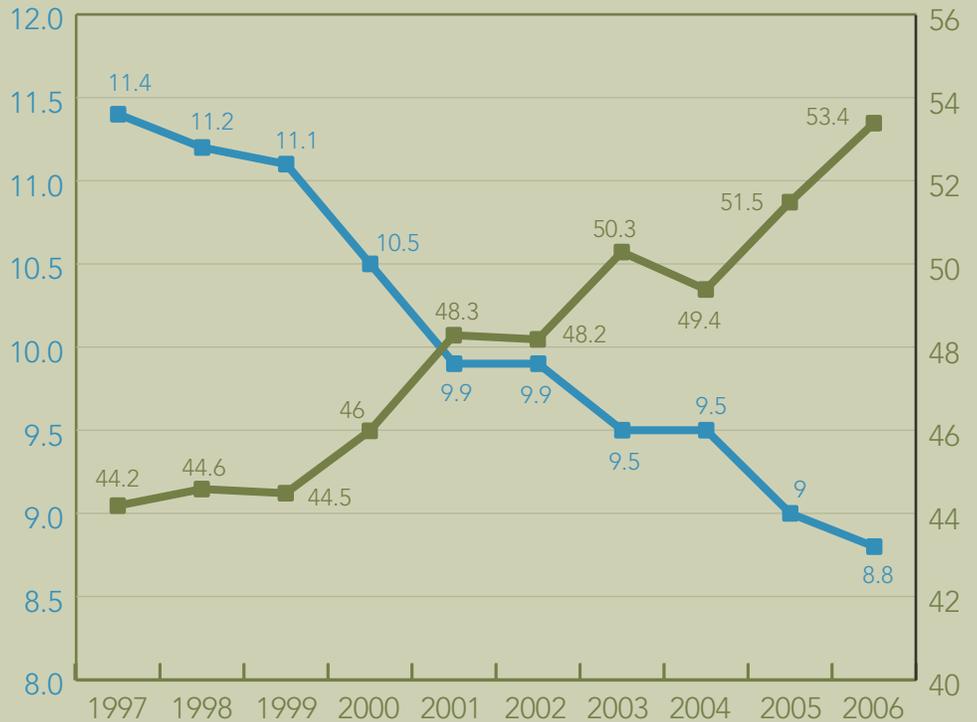
Reams of Progress Between the Sheets



## Paper Intensity and Recovery

Thousands of tons of paper per billion dollars of GDP

% Recovery Rate



Source: American Forest & Paper Association

There was a time when it seemed that paper was going to be history. The digital revolution would engender a “paperless office” that would be both efficient and environmental. Suffice it to say, it never happened. As one pundit put it: The paperless office turned out to be as practical as the paperless bathroom.

Still, paper use, calculated against gross domestic product, is on the decline — down about 23 percent since 1997 — and recovery rates have risen by nearly as much — about 20 percent, from 44.2 percent in 1997 to 53.4 percent in 2006. The shift seems to be happening slowly, at times imperceptibly, on an office-by-office basis.

At a macro level, paper use seems to have turned a page. There are significant positive shifts taking place, both in terms of how much paper is being used, and how much of that is being recovered and recycled. Even as the economy continues growing, as more businesses conduct more transactions of all kinds,

total paper use seems to have hit a plateau. And the amount of recovered paper in the global supply is growing faster than overall paper use.

In the last 10 years, the total domestic paper supply reached a peak and began steadily dropping, while the amount of paper recovered for reuse has climbed even faster. The net result is that, although total paper use grew by less than 1 percent in 10 years, the amount recovered grew by nearly 10 percent in the same time frame. And in what is perhaps a sign of things to come, the amount of recovered paper grew more between 2005 and 2006 than at any time in the past decade.

The drivers behind this change are both economic and environmental. Total paper use is steady as paper-intensive processes go digital — and as workers at all levels realize you don't have to print every document that crosses your hard drive. At the same time, paper recycling companies have learned there is big business in recovering and reselling what would otherwise be waste paper.

As in so many ways, China is a major factor behind this aspect of the green economy. With around 20 percent of the world's population and only 4 percent of the world's forests, the country imports massive amounts of pulp to meet its growing demand, and much of that is coming from post-industrial countries like the U.S.

Steady incremental progress is a good, of course, and experts see the trend continuing in coming years. But if the world is to achieve something more than step change, says Sheldon Zakresky at green-paper consultancy Metafore, boosting recycling numbers will require changing ingrained habits. And that takes reams of education. Delivered electronically, of course.

**In the last 10 years, the total domestic paper supply hit a peak and began steadily dropping, while the amount of paper recovered for reuse has climbed even faster.**

## Pesticide Use

Still Using  
Bushels  
of Toxics



### Pesticide Intensity for Four Major Crops

Pounds Per Acre



\*From 1991 to 2000, the USDA's National Agricultural Statistics Service surveyed corn, cotton, soybeans, and wheat every year. Beginning in 2001, the survey alternated years on crops. To provide an approximate average for these crops for these years, we averaged the acres planted and pesticides applied for corn in 2001 and 2002, and for soy in 2005 and 2006.

Source: U.S. Department of Agriculture, National Agricultural Statistics Service

There is almost no industry in the U.S. less predictable than agriculture. In addition to all the variables that apply to other businesses — ever-shifting commodity prices, consumer preferences, shifting supply chains, and so on — the essential fickleness of the natural world means that farmers are never sure what awaits them from one season to the next.

Our pesticide indicator looks at the use of insecticides, herbicides, fungicides, and other kinds of pest-control chemicals applied to corn, cotton, soybeans, and wheat in the U.S. in recent years. The data come from the USDA's National Agricultural Statistics Service, which surveys farmers each year about the number of acres of each crop they've planted and the nutrients and pesticides used on those crops.

The results are a mixed bag, befitting an industry that is susceptible to the vagaries of the weather. But what is clear is that, unlike many of the practices examined in this report, where slow but steady progress is being made to

reduce environmental impacts, Big Ag remains firmly rooted in the 20th century. To grow the food we need, the agricultural system requires large-scale monoculture farming, which in turn requires heavy inputs of both nutrients and pesticides.

It isn't that the country's food producers aren't trying to maximize efficiency. Since the dawn of agriculture's green revolution — the introduction in the mid-20th century of high-yield crop varieties, chemical fertilizers and pesticides, mechanized production, and large-scale monocultures — the latest technologies have been applied to the country's fields to grow more food from the same amount of farmland.

They've largely succeeded: U.S. agriculture produces a breathtaking array and quantity of produce, and leads the world in production of certain crops. But success has come at a high cost to the environment. Large-scale farming requires large-scale inputs of fertilizers and pesticides, with fallout including the annual dead-zones in the Gulf of Mexico (a huge algae bloom fed by excess nitrogen fertilizer flowing down the Mississippi River), as well as water pollution and negative effects on human health and natural ecosystems.

Another recent addition to agriculture's arsenal are genetically modified crops. Of the four field crops that make up the bulk of each year's plantings — corn, cotton, soybeans, and wheat — there are genetically modified versions of all but wheat. The varieties planted in the U.S. are designed to incorporate pesticides into each cell, resist the effects of chemical pesticides, or both, using stacked-trait varieties.

In the 21st century, the percentage of genetically modified corn, cotton, and soybeans planted has steadily increased: GMO corn represented 25 percent of all plantings in 2000 and 73 percent in 2007; soybeans grew from 54 percent to 91 percent in the same timeframe. Herbicide-resistant crops means farmers can spray more intensively than before, so it's unsurprising that pesticide use is not declining.

What about organic? Although organic agriculture has boomed in recent years — total acres have grown 40 percent between 2000 and 2005 — and farmers' markets and community-supported agriculture, or CSAs, are increasing demand for local, non-factory-farmed foods, the amount of acreage planted remains small. Per the 2002 USDA Census of Agriculture — the latest national data available — there were just under 1 billion acres planted nationwide. Thus, organics for that year represent roughly 0.14 percent of total acreage. Small potatoes, indeed.

**Herbicide-resistant crops means farmers can spray more intensively than before, so it's unsurprising that pesticide use is not declining.**

### Organic Farming Takes Root

Year	Certified Organic Operations	Acres
2000	6,592	1,218,905
2001	6,949	1,304,766
2002	7,323	1,299,632
2003	8,035	1,451,601
2004	7,808	1,452,353
2005	8,493	1,723,271

Source: USDA Economic Research Service

## Quality of Management

Gradual Progress,  
One Sector  
at a Time



### How Sectors Rate

Average Scores Across 48 Sectors on Environmental Criteria



Source: Innovest Strategic Value Advisors

How do you measure the overall quality of a sector as it manages its environmental performance? Fact is, you can't — at least not consistently across a wide range of sectors. That makes sense: Banks, biotech companies, and broadcasters have little in common from an environmental perspective.

Still, there are indicators, however imperfect, that give us a window into how various sectors are addressing environmental challenges and opportunities. We looked at a subset of Intangible Value Assessment™ (IVA), a rating service of Innovest Strategic Value Advisors, which integrates sustainability and finance to identify non-traditional sources of risk and value potential for investors. Innovest tracks company performance and strategy across more than 200 factors not captured by traditional financial-driven analysis. IVA was not created to compare sectors, but rather to allow investors to assess the performance of companies within a given sector.

We examined eight environmental categories tracked by Innovest that we believe are indicators of progress: strategy (examples include stated policies,

integration with the core business, links to environmental profitability); governance (board structure, senior environmental officer, environment as a factor in compensation); management systems (existence, number, and qualification of environmental staff, ISO 14000/other certified environmental management systems, environmental key performance indicators); audits (their existence, adequacy, frequency, impartiality); accounting (environmental reporting and accounting); training and development; certification (signatory to Ceres and other relevant codes); and products and materials (conducting life-cycle analyses, supplier environmental screens, eco-labels). All told, it's a rich set of indicators.

Innovest's analysts regularly track more than 2,000 companies across more than 50 sectors, assigning point scores to each of these factors, relative to other companies within that sector. The result gives investors and other interested parties a deeper understanding of how companies in those sectors are ready, willing, and able to meet the challenges — and exploit the opportunities — confronting them from an environmental perspective.

We took the average scores of each sector over the past eight years to look at longer-term patterns. The trend, as seen in the chart above, is clear: steady progress among companies in the quality of environmental management and governance, as assessed by Innovest. Between 2000 and 2007, the average across all 48 sectors rose by 31 percent, from 28.64 points to 37.54 points (out of a perfect score of 80).

How significant is this? It's hard to tell. Innovest stresses that the data we used weren't intended to track a market basket of sectors. The point assignments are subjective and analysts change from year to year. It's possible that some high scores reflect that some analysts were easier graders than others.

Still, the result of crunching these 380-odd pieces of data (representing 48 sectors across eight years) shows an unmistakable path: steady progress in how companies are positioning themselves, and their products and services, for a world in which companies' environmental impacts will become less external and more core to their bottom-line success.

**The data show steady progress in how companies are positioning themselves for a world in which companies' environmental impacts will become less external and more core to their bottom-line success.**

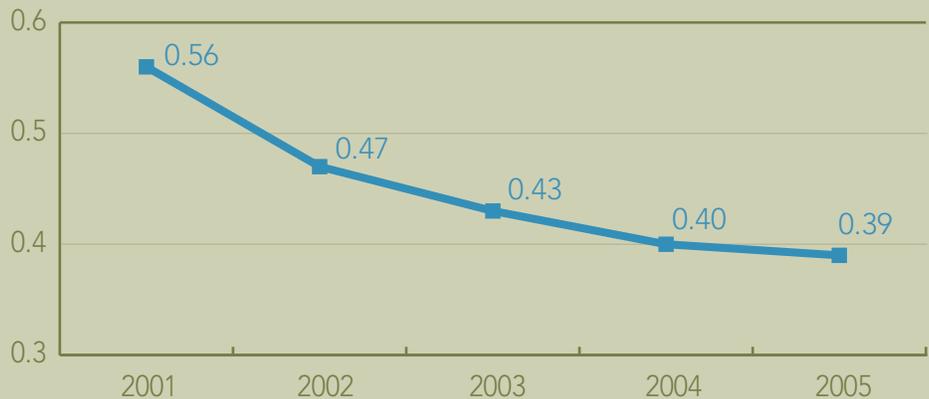
## Toxic Emissions

**Fewer and  
Fewer Pounds  
of Problems**



### Toxic Intensity Emissions Per Unit of GDP

Lbs/\$1000 GDP



Source: U.S. Environmental Protection Agency

America's factories are slowly decreasing the amount of toxic substances they emit into the air, land, and water. This reflects improved environmental processes and management systems in place in most manufacturing companies. Emissions actually ticked up 2.7 percent during 2005, the latest year for which data are available, but declined slightly when calculated as a percentage of gross domestic product.

The declining trend in emissions also reflects the overall loss of manufacturing in the U.S., which has dropped 17 percent since 2001, in terms of its contribution to GDP. Still, that doesn't fully account for the 22 percent overall decline in toxic emissions during that same five-year period, based on the federal government's Toxics Release Inventory, or TRI. That adds up to more than 1.2 billion pounds of reduced emissions.

A 1986 federal law requires U.S. manufacturers to report annually to the federal government precise data reflecting the amount of certain hazardous substances they release into the environment from their facilities. Companies that must report under this act are manufacturing facilities in the U.S. with 10 or more employees that use one or more of the nearly 650 toxic TRI chemicals above certain threshold amounts.

The TRI program came about as a result of major incidents in which industrial workers and communities demanded information on hazardous materials. These included the 1984 Union Carbide chemical release in Bhopal, India, causing 20,000 deaths, followed by a similar, less-deadly release at a plant in West Virginia.

TRI has been a boon to those desiring a peephole into how, and how much, companies are emitting potentially toxic chemicals. With the TRI came a plant-by-plant, chemical-specific, quantitative analysis of company operations. At the same time, the data provide the companies themselves with a new tool — and plenty of incentives — for their own pollution prevention or waste reduction

efforts. Prior to the introduction of TRI data, many companies had no idea how much waste they were generating in the form of pollution. TRI data have become the basis for setting company efficiency goals and improvements.

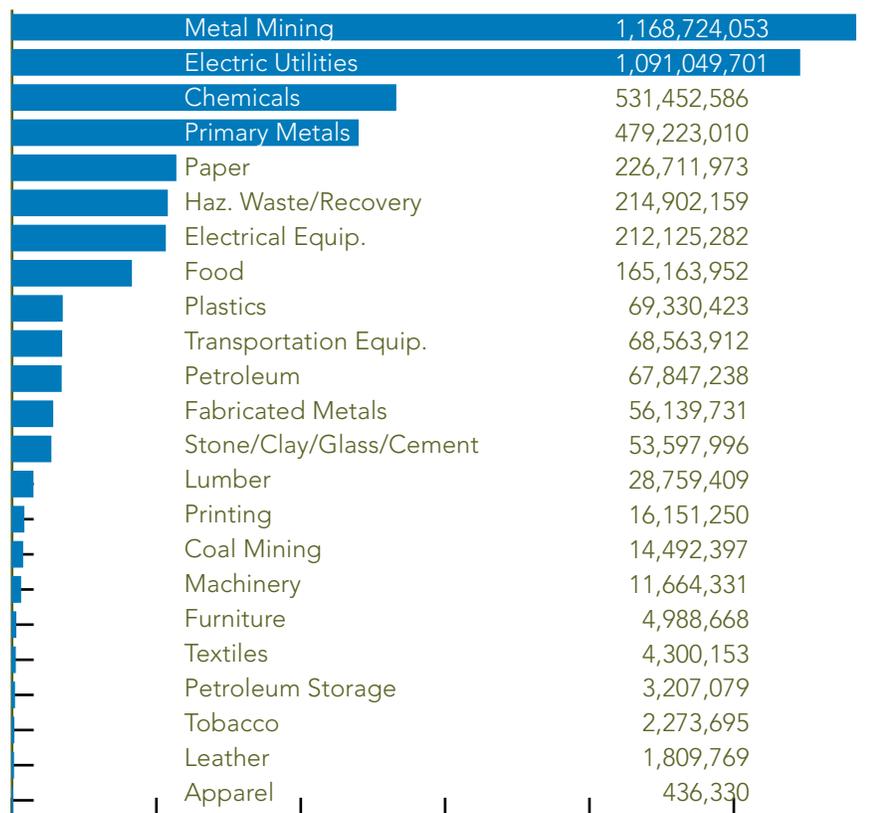
The metal mining sector remained the biggest emitter of toxic materials in 2005, particularly in regards to lead and mercury and their related compounds. The 2.7 percent increase in industrywide TRI emissions resulted in part from a 2003 court case that changed reporting requirements of waste rock from metal mines, thereby increasing that sector's numbers. Still, metal mining emissions decreased 49 percent overall between 2001 and 2005, more than twice the reduction rate of all industry.

Other industries that reported high toxic emissions include electric utilities, hazardous-waste management facilities, chemical manufacturers, and primary metal facilities. Chemical manufacturing was among the sectors reporting the largest decreases in toxic emissions, along with petroleum refiners and the transportation equipment industry.

Industry's 2005 emissions included 179 known or suspected carcinogens, representing 923 million pounds or 21 percent of total releases in 2005. Of that total, lead and lead compounds accounted for 51 percent, with arsenic and arsenic compounds accounting for 20 percent.

**Chemical manufacturing was among the sectors reporting the largest decreases in emissions, along with petroleum refiners and the transportation equipment industry.**

Toxic Emissions by Sector, 2005



Sources: U.S. Environmental Protection Agency

## Indicators We Wish We Had

We weren't able to create all of the indicators we wanted to use to measure the progress of green business, though we hope to add them in subsequent reports. Our wish list includes:

**Water.** We wanted to measure water efficiency — the amount of water used per unit of GDP. We were shocked to discover that there is no annually updated metric for national water use. The most recent data is for the year 2000. The U.S. Geological Survey publishes state-by-state water use data every five years, and always two to three years after the fact. (Data for 2005 are anticipated sometime in 2008.) That seems inadequate, given the growing concerns over both water quality and quantity in the U.S., including the potential for climate change to increase drought frequency.

**Materials Efficiency.** Speaking very broadly, the country as a whole — commercial and residential sectors alike — is recycling more waste, even if we're also generating more garbage overall. The EPA's Municipal Solid Waste report, created by Franklin Associates each year, does a solid job tracking solid waste, but there remain big holes in the puzzle. Special commercial wastes, including construction and demolition waste, hazardous wastes, e-waste, and others make up a significant portion of the national waste stream — but we can't know how much because all the data are collected differently state by state, if at all, and garbage regularly moves across state and national borders. As a result, this broad swath of garbage information remains swept under the rug, or scattered to the wind.

**Green IT.** Tremendous increases in the volume of data and online transactions have fueled heavy investment in data-center systems capacity. Packing these data centers with high-performance IT servers that require elaborate cooling systems has come at a cost: Electricity expenses are inflating corporate budgets and in some places, straining the reliability of the power grid. This situation caught the attention of Congress in 2006, which ordered the U.S. Environmental Protection Agency to study trends in data-center energy use. The agency delivered a report in 2007 estimating that the IT sector consumed roughly 61 billion kilowatt-hours in 2006, or 1.5 percent of total U.S. electricity usage — more than double the estimates from 2000. "It's the mother's milk of IT," Andrew Fanara, the U.S. EPA's Energy Star product specifications team leader, told us.

**Green Job Creation.** How many jobs are being created through all of the kinds of activities measured in this report? No one knows. There are estimates for jobs in clean technologies, but that's only a small part of the picture. How about people working inside non-clean-tech companies on energy efficiency, or as recycling coordinators, as environmental procurement specialists, or any of dozens of other positions that have a green component? We need a means of understanding the impact of green business activities on job growth.

**Green Business Growth.** Similarly, there's no good metric for the number of green businesses, their revenue, growth, or other metrics. There's good reason for this: There's no definition for "green business." Does it refer to a company specifically in the business of environmentally preferable products or services? How about a dry cleaner or print shop that employs environmental practices? How about a division of a multinational company that is working on clean energy, bio-based materials, less-toxic cleaners, or any of hundreds of other environmentally improved products? We need a means of measuring the size and scope of environmental practices on the economy, and tracking over time.

We welcome your ideas about data sources and methodologies for tracking the progress (or lack thereof) of these indicators on an annual basis. Please send comments to [sogb@greenerworldmedia.com](mailto:sogb@greenerworldmedia.com).

Over the course of a typical year, we see thousands of new things — websites, reports, tools, books, organizations, partnerships, and countless other resources and initiatives aimed at the greening of mainstream business. Many of these things make it into our own websites and e-newsletters, others don't. In the pages that follow, we've created some highly subjective lists of resources, stories, and other things we think are worth sharing.

Please visit [GreenBiz.com](http://GreenBiz.com), [ClimateBiz.com](http://ClimateBiz.com), [GreenerBuildings.com](http://GreenerBuildings.com), and [GreenerComputing.com](http://GreenerComputing.com), along with their respective free e-newsletters, for the latest of all of these things.

## New Online Tools and Resources

Premier Launches Green Best Practices Website  
[www.greenbiz.com/sogb/34895](http://www.greenbiz.com/sogb/34895)

New Online Tool Helps Companies Calculate Emissions  
[www.greenbiz.com/sogb/34855](http://www.greenbiz.com/sogb/34855)

Online Tool Reveals Sustainability Best Practices  
[www.greenbiz.com/sogb/34670](http://www.greenbiz.com/sogb/34670)

GEMI Releases Interactive Sustainable Development Tool  
[www.greenbiz.com/sogb/34622](http://www.greenbiz.com/sogb/34622)

New Tool Helps Reduce Business Trips' Footprint  
[www.greenbiz.com/sogb/34864](http://www.greenbiz.com/sogb/34864)

New Web Tool Makes Carbon-Neutral Buildings Easier  
[www.greenbiz.com/sogb/36073](http://www.greenbiz.com/sogb/36073)

EPA Launches Tool to Help Measure Emissions From Commercial Buildings  
[www.greenbiz.com/sogb/35992](http://www.greenbiz.com/sogb/35992)

New Online Tool Helps Determine Data Center Efficiency  
[www.greenbiz.com/sogb/36331](http://www.greenbiz.com/sogb/36331)

## New Reports and Research

AASHE Project Helps Campuses Fund Sustainability Projects  
[www.greenbiz.com/sogb/34901](http://www.greenbiz.com/sogb/34901)

Tenants Willing to Pay More for Green Building: Report  
[www.greenbiz.com/sogb/36374](http://www.greenbiz.com/sogb/36374)

EPA Guides Top Industries on Energy-Saving Strategies  
[www.greenbiz.com/sogb/34871](http://www.greenbiz.com/sogb/34871)

Guidebook for Sustainable Purchasing Released  
[www.greenbiz.com/sogb/34720](http://www.greenbiz.com/sogb/34720)

Report Finds Another Benefit to Energy Efficiency  
[www.greenbiz.com/sogb/34672](http://www.greenbiz.com/sogb/34672)

Report Links Leader Mindset Development and Corporate Sustainability Success  
[www.greenbiz.com/sogb/36382](http://www.greenbiz.com/sogb/36382)

More Than 300 U.S. Hotels Now Certified 'Green'  
[www.greenbiz.com/sogb/35661](http://www.greenbiz.com/sogb/35661)

WWF-UK Gives Luxury Companies Poor Grades

[www.greenbiz.com/sogb/36335](http://www.greenbiz.com/sogb/36335)

Most Green Marketing Claims Aren't True, Says New Report

[www.greenbiz.com/sogb/36271](http://www.greenbiz.com/sogb/36271)

From Risk to Opportunity 2007: Insurer Responses to Climate Change

[www.greenbiz.com/sogb/94978](http://www.greenbiz.com/sogb/94978)

Lenovo Tops List of Green Electronics Makers

[www.greenbiz.com/sogb/34868](http://www.greenbiz.com/sogb/34868)

BOP Becoming a Hot Subject at Business Schools, Report Finds

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Staples, FedEx Kinko's Top Scorecard: Report

[www.greenbiz.com/sogb/35879](http://www.greenbiz.com/sogb/35879)

New Study Asks: Can Globalization and Sustainability Coexist?

[www.greenbiz.com/sogb/35350](http://www.greenbiz.com/sogb/35350)

Corporate America Embraces Green Practices, Study Shows

[www.greenbiz.com/sogb/35018](http://www.greenbiz.com/sogb/35018)

Insurance Industry Dives in to Sustainability

[www.greenbiz.com/sogb/35383](http://www.greenbiz.com/sogb/35383)

Financial Firms Detail Climate Change Risks, Opportunities

[www.greenbiz.com/sogb/34529](http://www.greenbiz.com/sogb/34529)

## **New Sustainability Initiatives**

3C Initiative Unites Big Companies to Combat Climate Change

[www.greenbiz.com/sogb/34443](http://www.greenbiz.com/sogb/34443)

Latest X-Prize Inspires Super-Efficient Vehicles

[www.greenbiz.com/sogb/34857](http://www.greenbiz.com/sogb/34857)

Electronic Product Environmental Assessment Tool

[www.greenbiz.com/sogb/69691](http://www.greenbiz.com/sogb/69691)

'Climate Counts' Reveals Which Companies Are Walking the Walk

[www.greenbiz.com/sogb/35430](http://www.greenbiz.com/sogb/35430)

U.S. Climate Action Partnership

[www.greenbiz.com/sogb/34458](http://www.greenbiz.com/sogb/34458)

C40 Large Buildings Retrofit Program

[www.greenbiz.com/sogb/35077](http://www.greenbiz.com/sogb/35077)

BSR Launches Environmental Markets Initiative

[www.greenbiz.com/sogb/33558](http://www.greenbiz.com/sogb/33558)

Green Cleaning Network Launches Industry Climate Initiative

[www.greenbiz.com/sogb/36239](http://www.greenbiz.com/sogb/36239)

## New and Noteworthy Books of 2007

A Strategic Approach to the Environmentally Sustainable Business

[www.greenbiz.com/sogb/75796](http://www.greenbiz.com/sogb/75796)

Branded: How the 'Certification Revolution' is Transforming Global Corporations

[www.greenbiz.com/sogb/95596](http://www.greenbiz.com/sogb/95596)

Capitalism 3.0: A Guide to Reclaiming the Commons

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Capitalism As If the World Matters

[www.greenbiz.com/sogb/93484](http://www.greenbiz.com/sogb/93484)

Cut Carbon, Grow Profits

[www.greenbiz.com/sogb/82683](http://www.greenbiz.com/sogb/82683)

Ecological Design, Tenth Anniversary Edition

[www.greenbiz.com/sogb/89488](http://www.greenbiz.com/sogb/89488)

Ethical Markets: Growing the Green Economy

[www.greenbiz.com/sogb/76198](http://www.greenbiz.com/sogb/76198)

Green Manufacturing: Case Studies in Lean and Sustainability

[www.greenbiz.com/sogb/95757](http://www.greenbiz.com/sogb/95757)

Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage

[www.greenbiz.com/sogb/77359](http://www.greenbiz.com/sogb/77359)

Harvard Business Review on Green Business Strategy

[www.greenbiz.com/sogb/94806](http://www.greenbiz.com/sogb/94806)

Ignition: What You Can Do to Fight Global Warming and Spark a Movement

[www.greenbiz.com/sogb/90096](http://www.greenbiz.com/sogb/90096)

The Business Guide to Sustainability: Practical Strategies and Tools for Organizations

[www.greenbiz.com/sogb/78293](http://www.greenbiz.com/sogb/78293)

The Business of Climate Change

[www.greenbiz.com/sogb/90895](http://www.greenbiz.com/sogb/90895)

The Clean Tech Revolution: The Next Big Growth and Investment Opportunity

[www.greenbiz.com/sogb/80726](http://www.greenbiz.com/sogb/80726)

The New Capitalists: How Citizen Investors Are Reshaping the Corporate Agenda

[www.greenbiz.com/sogb/77139](http://www.greenbiz.com/sogb/77139)

The New Environmental Regulation

[www.greenbiz.com/sogb/91184](http://www.greenbiz.com/sogb/91184)

The Sustainability Handbook: The Complete Management Guide to Achieving Social, Economic, and Environmental Responsibility

[www.greenbiz.com/sogb/78668](http://www.greenbiz.com/sogb/78668)

World, Inc.: How the Growing Power of Business Is Revolutionizing Profits, People and the Future of Both

[www.greenbiz.com/sogb/76620](http://www.greenbiz.com/sogb/76620)

## Noteworthy Websites and blogs

GreenItForward  
[green-it-forward.com](http://green-it-forward.com)

HealthyCar  
[www.HealthyCar.org](http://www.HealthyCar.org)

CoolFleets  
[www.CoolFleets.com](http://www.CoolFleets.com)

18Seconds  
[www.18Seconds.org](http://www.18Seconds.org)

ASimpleSwitch  
[www.asimpleswitch.com](http://www.asimpleswitch.com)

NextGenerationEarth  
[www.nextgenerationearth.org](http://www.nextgenerationearth.org)

Dell Earth  
[www.dell.com/earth](http://www.dell.com/earth)

Climate Savers Computing  
[www.climatesaverscomputing.org](http://www.climatesaverscomputing.org)

Filter For Good  
[www.filterforgood.com](http://www.filterforgood.com)

Cooler  
[www.climatecooler.com](http://www.climatecooler.com)

BadBuster  
[www.badbuster.com](http://www.badbuster.com)

Climate Counts  
[www.climatecounts.org](http://www.climatecounts.org)

## Green Building Headlines

Chrysler Breaks Ground on Country's Greenest Auto Dealership  
[www.greenbiz.com/sogb/35580](http://www.greenbiz.com/sogb/35580)

Team Aims to Build World's Highest-Rated, LEED-Certified Complex  
[www.greenbiz.com/sogb/35551](http://www.greenbiz.com/sogb/35551)

New Study Finds Health Care Industry Embracing Green Buildings  
[www.greenbiz.com/sogb/35428](http://www.greenbiz.com/sogb/35428)

Home Depot Launches \$100M Development Plan  
[www.greenbiz.com/sogb/35290](http://www.greenbiz.com/sogb/35290)

Clinton Climate Initiative Offers \$5B to Green Cities' Buildings  
[www.greenbiz.com/sogb/35077](http://www.greenbiz.com/sogb/35077)

Corporate Real Estate the Next Frontier in Green Buildings  
[www.greenbiz.com/sogb/35008](http://www.greenbiz.com/sogb/35008)

Major Green Building Agreement Changes How Homes are Made  
[www.greenbiz.com/sogb/34696](http://www.greenbiz.com/sogb/34696)

USAA Real Estate to Reduce its Portfolio Energy Use 30 Percent by 2012  
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Building Green Can Provide an Edge in a Tough Market, Report Finds  
[www.greenbiz.com/sogb/35894](http://www.greenbiz.com/sogb/35894)

Johnson Controls Helps Develop 'Net Zero' Building  
[www.greenbiz.com/sogb/36041](http://www.greenbiz.com/sogb/36041)

Corporations Are Embracing Green Real Estate, Survey Finds  
[www.greenbiz.com/sogb/36175](http://www.greenbiz.com/sogb/36175)

Mayors, Wal-Mart Team to Lower Green Building Products' Cost  
[www.greenbiz.com/sogb/36195](http://www.greenbiz.com/sogb/36195)

ISO Creates Standard for Sustainable Building  
[www.greenbiz.com/sogb/36364](http://www.greenbiz.com/sogb/36364)

### **Climate Business Headlines**

All Commercial Buildings Can Be Carbon Neutral, U.K. Report Finds  
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IBM Study Finds Consumers Willing to Pay Extra for Clean Energy  
[www.greenbiz.com/sogb/36423](http://www.greenbiz.com/sogb/36423)

DHL, USPS Top List of Climate Conscious Shippers  
[www.greenbiz.com/sogb/36412](http://www.greenbiz.com/sogb/36412)

First Global Carbon Index Unveiled  
[www.greenbiz.com/sogb/36376](http://www.greenbiz.com/sogb/36376)

Xerox Hits GHG Reduction Goal Six Years Early, Sets Target Higher  
[www.greenbiz.com/sogb/36341](http://www.greenbiz.com/sogb/36341)

New Carbon Standard Brings Integrity and Transparency to Carbon Offsets  
[www.greenbiz.com/sogb/36288](http://www.greenbiz.com/sogb/36288)

Group Forms to Promote High-Quality Offsets  
[www.greenbiz.com/sogb/36208](http://www.greenbiz.com/sogb/36208)

AEP to Pay More Than \$4B to Cut Emissions  
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Dell Aims for Carbon Neutrality by 2008  
[www.greenbiz.com/sogb/35981](http://www.greenbiz.com/sogb/35981)

Coca-Cola, Cadbury Schweppes Volunteer to Measure Carbon Footprint of Some Products  
[www.greenbiz.com/sogb/35973](http://www.greenbiz.com/sogb/35973)

Morgan Stanley, DNV Launch Carbon Bank  
[www.greenbiz.com/sogb/35728](http://www.greenbiz.com/sogb/35728)

Sony Cuts Power Consumption in 90 Percent of its Products  
[www.greenbiz.com/sogb/35718](http://www.greenbiz.com/sogb/35718)

PepsiCo Becomes Largest Corporate Buyer of Renewable Energy  
[www.greenbiz.com/sogb/35004](http://www.greenbiz.com/sogb/35004)

Yahoo! to Go Carbon Neutral in 2007  
[www.greenbiz.com/sogb/34915](http://www.greenbiz.com/sogb/34915)

Companies, Activists Launch U.S. Climate Partnership  
[www.greenbiz.com/sogb/34458](http://www.greenbiz.com/sogb/34458)

GE, AES Plan Partnership to Offset Climate Emissions  
[www.greenbiz.com/sogb/34447](http://www.greenbiz.com/sogb/34447)

Swiss Re Offers Employee Rebate to Reduce Carbon Footprint  
[www.greenbiz.com/sogb/34400](http://www.greenbiz.com/sogb/34400)

## Green Computing Headlines

Fujitsu Launches Green Infrastructure Services  
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Green Electronics Buyers on the Rise, Research Shows  
[www.greenbiz.com/sogb/36365](http://www.greenbiz.com/sogb/36365)

IBM's Energy Efficiency Certificate Program an Industry First  
[www.greenbiz.com/sogb/36207](http://www.greenbiz.com/sogb/36207)

Sony Europe's Takeback Program Shows Benefits, Saves Money  
[www.greenbiz.com/sogb/36146](http://www.greenbiz.com/sogb/36146)

Dell Launches Global Competition to Design World's Greenest Computer  
[www.greenbiz.com/sogb/36130](http://www.greenbiz.com/sogb/36130)

Office Depot Extends Tech Recycling Service Continent-Wide  
[www.greenbiz.com/sogb/36096](http://www.greenbiz.com/sogb/36096)

Majority of Companies Plan to Green Their Data Centers  
[www.greenbiz.com/sogb/35829](http://www.greenbiz.com/sogb/35829)

Citigroup to spend \$232M on Green Data Center  
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