

STATE OF GREEN BUSINESS 2009

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and the editors of

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Contents

Introduction.....	3
Top Stories of 2008	4
The Green Economy Gains Currency	4
Water Becomes the New Carbon.....	5
Building Efficiency Rises Again.....	7
Universities Take Class Actions.....	9
Green Moves Up, and Down, the Chain of Command	10
Product Stewardship Creates a Material Change.....	11
Green Marketing Suffers a Failure to Communicate	13
Carbon Becomes a Business Imperative	14
Information Technology Plugs Into Green.....	16
Greener Design Comes Out of the Lab	17
The GreenBiz Index	
Introduction	19
Summary Chart	20
Building Energy Efficiency	22
Carbon Intensity	24
Carbon Transparency	26
Cleantech Investments	28
Clean-Energy Patents.....	30
Corporate Reporting	32
Employee Commuting	34
Employee Telecommuting	36
Energy Efficiency	38
E-Waste	40
Financial Impacts.....	42
Fleet Impacts.....	44
Green Jobs.....	46
Green Office Space	48
Green Power Use	50
Packaging Intensity	52
Paper Use and Recycling.....	54
Toxic Emissions	56
Toxics in Manufacturing.....	58
Water Intensity.....	60
Credits / About Greener World Media.....	62

Infographics by Seth Fields

Last year, when we launched the inaugural State of Green Business report, we set out to measure the environmental impacts of the growing green economy. We were sobered and encouraged by what we found. Our efforts to measure, for the first time ever, whether and how companies were reducing their environmental impacts revealed mixed results: More companies were doing more things, but moving the needle of environmental progress only slightly, if at all.

This year's update is a similar mixed bag of encouraging and discouraging news. But on balance, despite a growing chorus of corporate commitments and actions, we're less optimistic that these activities, in aggregate, are addressing planetary problems at sufficient scale and speed.

Consider: Absolute greenhouse gas emissions grew 1.4 percent in 2007 over 2006 but shrank 0.6 percent per unit of GDP — the smallest annual decrease since 2002. Or consider electronic waste: Despite widespread discussions in boardrooms and legislatures about the dangers of e-waste, we recycled only a tiny fraction more e-waste in 2007 than the year before, even as the amount of e-waste entering the waste stream grew substantially.

Still, there is reason for optimism. Green building is on the rise, spurring new technologies that save energy and money while creating more healthful workplaces. There is a green race taking place in the automobile industry, with every major manufacturer planning to introduce electric vehicles. The leading consumer product makers and retailers are starting to rigorously assess the environmental impact of their products using sophisticated metrics, sending signals up the supply chain that tomorrow's products will need to hew to higher levels of environmental responsibility.

Of course, all this is taking place during a time of staggering turbulence in the economy, and at the dawn of a new political era in the United States, the combination of which is causing both uncertainty and excitement over the notion of a green economy as a means of national economic and environmental security. As this report is being published, we stand on the cusp of a potential explosion of new ideas, inventions, and initiatives, but face great questions about whether there will be sufficient resources to bring them to fruition.

At the end of the day, the questions remain: Are we moving far enough, fast enough? Does the ever-growing green activity in the business world represent a true transformation, one capable of adequately addressing pressing issues like climate change, air quality, the loss of species, and the looming water crisis? Or is it merely nibbling at the edges of the problems? Reasonable minds can justifiably argue both sides.

The coming year will be a critical one for the future of green business and, by extension, the future of the planet.

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

It was the best of times and — well, you know the rest. The greening of mainstream companies during 2008 continued more or less unabated on its multi-year trajectory, with a growing number of global companies joining in with increasingly more substantive commitments and achievements. But economic woes rocked corporate environmental strategy much as it did everything else, leading to cutbacks, layoffs, and uncertainty about how, and how much, companies would be able to invest in new technologies and initiatives to support green innovations or reduce their environmental impacts. All this during a time of transformation, as a new U.S. president and Congress prepared to unleash an unprecedented number of initiatives aimed at stimulating a new green economy.

Good news . . . bad news . . . good news. It felt at times during 2008 that one needed a neck brace. We don't expect to be removing it much during 2009.

To make sense of the year just passed, we scoured the nearly 1,500 news stories, feature articles, podcasts, and blog posts published during 2008 on our five websites — GreenBiz.com, ClimateBiz.com, GreenerBuildings.com, GreenerComputing.com, and GreenerDesign.com — in search of themes, trends, and movements. Here are 10 in no particular order.

1. The Green Economy Gains Currency

The notion of a green economy — economic activity by companies and customers in the form of products, services, and business models that promote economic growth, reduced environmental impacts, and improved social well-being — gathered steam in 2008. One key driver: the U.S. presidential campaign, the first ever where both major-party candidates discussed accelerating investments in alternative energy, electric vehicles, a “smart” electric grid, and, not insignificantly, the green jobs these things would create. The conversation accelerated during the fall, as the economy tanked and unemployment rose. Suddenly, the green economy was seen as a pathway out of economic gloom.

The year produced a small library of studies showing the potential for creating millions of green jobs for both blue- and white-collar workers, though the studies varied about what kinds of jobs fell under the “green” rubric. [One study showed](#) how 45 occupations employing more than 14 million people across the country can be boosted through investments in green measures. Another saw the creation of [2 million jobs in two years](#). Still another [projected 4.2 million green jobs by 2038](#). Globally, the United Nations predicted that renewable energy could create [20 million jobs by 2030](#).

How much would all this cost? The plans and studies varied widely. Research by the nonprofit Apollo Alliance concluded that a [\\$500 billion investment over 10 years](#) on a range of energy, education, construction, building, and manufacturing programs would create 5 million jobs. Another study, from the University of Massachusetts at Amherst, found that [\\$100 billion would yield 2 million new jobs](#) — about half the price per job of the Apollo study.

At whatever price, green jobs seemed red hot around the world. The think tank Worldwatch revealed that [renewable energy already employs](#), directly or indirectly, 2.3 million people worldwide “with the largest gains made where

governments support renewables.” Acre Resources, a U.K. recruitment firm, [reported it had seen a 20 percent increase](#) in the number of green-collar jobs in just one year. Jobs related to energy reduction and emissions management alone increased by 180 percent. [A British government study](#) predicted 1 million green-collar workers over the next 20 years.

But studies don't equate to jobs, and it remained unclear when and where, exactly, the green-job boon would take place. There are relatively few pockets of green-collar workers anywhere, despite several cities' and states' efforts to tap into alternative energy, green building, electric cars, and other clean technologies as a means of economic and workforce development. One reason for the slow growth of green jobs: Many big companies creating cleantech businesses [are simply hiring from within](#), or are repurposing existing staff, with few net new jobs created. And few start-ups have scaled sufficiently to be significant employers.

Another challenge is a lack of qualified workers many of these industries need, [according to experts](#). Moreover, say critics, employers are applying 20th-century hiring expectations to 21st-century industries, such as asking for years-long experience in fields that are relatively nascent.

But the recession is changing the rules, and all signs are that the Obama administration will embrace a range of policies and initiatives to jumpstart America's cleantech sector, with job creation joining energy independence and national security as patriotic rallying cries. Wal-Mart, too: The discount retailer [launched a green jobs council](#) in partnership with many of its leading suppliers of goods and services in an effort to help rebuild and retool America's workforce. We'll see if America's low-cost retailer can also be a green-jobs machine.

2. Water Becomes the New Carbon

It has become eco-chic in recent years to declare that “water will be the oil of the 21st century” — an essential and limited resource, unevenly distributed around the world, the growing shortage of which will lead to economic power for water-rich nations and poverty for the rest, possibly even resource wars between the haves and have-nots. Given that, [how do water-dependent companies manage](#) in a world where water quality and quantity become a constraint to doing business?

The question has remained largely theoretical, the basis of scenario and contingency planning for a handful of firms, with relatively few companies engaging in water strategy planning. But as the effects of climate change materialize with greater frequency, companies from California to Calcutta are taking a deeper dive into water efficiency, measuring and managing its use and finding ways to close the loop, even setting goals to become “water neutral.” In that regard, water is less the “new oil” than the new carbon.

The large beverage companies seem to be at the forefront of this wave. [Anheuser-Busch announced](#) that its companywide water use increased 2.4 percent over five years while its beverage production climbed about 2 percent. But thanks to a number of efficiency efforts, the brewer managed to reduce the

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Coca-Cola's systemwide goal is to return all water used in its operations back to nature. Its mantra: Reduce, recycle, and replenish.

Select Corporate Water Headlines of 2008

[Anheuser-Busch's Water Use Flat Despite Increased Production](#)

[Cadbury Cuts Water Use 10 Percent](#)

[Can Markets Solve the Water Pollution Problem?](#)

[Coca-Cola Taps WWF to Cut Water Use and Emissions](#)

[GE Plans 20 Percent Cut in Water Use by 2012](#)

[Starbucks Runs Into Water Waste Controversy](#)

[WBCSD Helps Form Water Footprint Network](#)

[More water stories](#)

amount of water used make beer, keeping its water use, well, flat. Coca-Cola is [aiming for water neutrality](#). In 2007, the company [developed an integrated water strategy](#) focused on plant performance (water use efficiency, water quality, and wastewater treatment), watershed protection, enabling access to clean drinking water, and working to drive global awareness and action to address water challenges. Coke's systemwide goal is to return all water used in its operations back to nature. Its mantra: Reduce, recycle, and replenish.

But water efficiency is also bubbling up in other sectors. GE said it [plans to cut freshwater use 20 percent](#), in absolute terms, through reuse efficiencies in its commercial and manufacturing processes. The company's learnings will be passed on to its industrial, municipal, and government customers. GE issued a water reuse white paper to help communities and governments boost water recycling and reuse. IBM [announced a water management research center](#) in the Netherlands as part of its [Big Green Innovations](#) initiative. The company also issued a report [outlining the concept](#) for an educational and perhaps advocacy organization focused on establishing the value of applying advanced sensing, information technology, and modeling to water management in the U.S.

Some of the action on water taps into a wellspring of knowledge of how to measure the full water impacts of products. The notion of "embedded water" (also referred to as "virtual water") [has achieved increased attention](#) in a handful of companies. The term refers to the amount of water used in the production and trade of food and consumer products — again, a counterpart to the notion of embedded carbon. A cup of coffee, for instance, has 140 liters (about 37 gallons) of embedded water, when you consider the amount used to grow, produce, package, and ship the beans. A hamburger contains 2,400 liters (634 gallons). Such metrics provide new opportunities to better understand, manage, and reduce water use.

3. Building Efficiency Rises Again

The move to improve the efficiency of existing commercial and industrial buildings revved up in 2008, a combination of rising energy prices, improved technologies, and the recognition that even during lean times, investments in more efficient real estate can pay handsome dividends. The acceleration of efficiency measures was also borne of a realization that buildings represent a solid foundation for reducing greenhouse gas emissions. (Factoid: Government buildings in England and Wales emit more than 11 million tons of carbon dioxide a year — [more than the entire country of Kenya.](#))

Companies seemed to be outdoing one another in commitments and achievements. The New York Times Co. said its new 52-story tower in New York City was [found to use a miserly 0.38 watts per square foot](#), well under the typical level of 1.5 to 1.9 watts per square foot, saving 70 percent more energy than the company's original benchmark. Healthcare executives [are placing greater importance](#) on energy efficiency compared with their counterparts in other industries, according to one study. Image-sensitive retailers like [JCPenney](#), [Giant Eagle](#), [Target](#), and [McDonald's](#) all demonstrated more energy-efficient stores. The latter, which spends more than \$1.5 billion a year globally to power its restaurants, said it views energy efficiency as a significant opportunity to cut costs and improve the environment. Others in the hospitality industry [saw similar opportunities](#).

Local jurisdictions joined in. San Francisco's Building Inspection Commission [passed strict green building codes](#), to be phased in over a number of years, that would make new large commercial and residential construction comply with the U.S. Green Building Council's LEED rating system or with a rival GreenPoint Rated standard. The rules are expected to avoid 60,000 tons of carbon dioxide emissions, save 220,000 megawatt-hours of power, and prevent the use of 100 million gallons of water. Meanwhile, through a high-voltage partnership with the National Governors Association, Wal-Mart said it would [perform energy audits in 20 state capitols](#) to identify ways in which they can reduce energy consumption.

There are vast sums of money to be saved from all this efficiency, of course, but also significant environmental gains. A [study by GreenerBuildings.com](#) found that green buildings have saved the U.S. enough energy to avoid the equivalent of burning 1.3 million tons of coal for electricity since the development of the LEED standards. Indeed, green building practices could cut greenhouse gases in North America more effectively than any other action, [according to research](#) from the Commission for Environmental Cooperation. The Commission, a U.S.-Canadian-Mexican partnership, also recommended a number of incentives to support green building, help builders overcome the occasional additional costs of green building, and convince developers to choose green building practices even when the long-term savings will go to the building owner or tenants.

Moreover, efficient buildings, coupled with a smarter electricity infrastructure, could also [avert the need for building new power plants](#), and keep "peaker" plants — which are often older, less-efficient generators — turned off during

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The Environmental Impact of Green Buildings

The LEED green building rating system was created to reduce the environmental impacts of the built environment, but until last year no comprehensive evaluation of the overall impact of LEED had been conducted. In November 2008, Robert Watson, executive editor of GreenerBuildings.com published the [Green Building Impact Report 2008](#), the first integrated assessment of the land, water, energy, material and indoor environmental impacts of the LEED standards.

Watson found that “LEED buildings make a significant impact in reducing the overall environmental footprint of individual structures. However, significant additional progress is possible and indeed necessary on both the individual building level and in terms of market penetration, if LEED is to contribute in a meaningful way to reducing the environmental footprint of buildings in the U.S. and worldwide.” Among the findings:

- LEED buildings, which operate on about a quarter less energy than their conventional counterparts, have so far prevented the burning of about 1.3 million tons of coal for electricity. By 2015, that figure could hit nearly 26 million tons.
- LEED buildings have saved the U.S. 9.5 billion gallons of water, an amount that could surpass 133 billion gallons by 2015. Water savings could double again by 2020.
- LEED building occupants have driven nearly 400 million fewer miles since 2004, and may drive more than 4 billion fewer miles by 2020.

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

periods of high electricity demand. When extra power is needed, rather than firing up a standby power plant, a local utility could selectively and briefly turn off the air conditioning or refrigeration units in large office buildings, warehouses, big-box stores, and other facilities in its service area. It does this for brief, staggered intervals — imperceptible to occupants — reducing overall demand sufficient to avoid adding new generation capacity. The result: Demand drops enough to avoid firing up standby power plants — and maybe even eliminate some of them altogether.

Despite the successes, energy efficiency measures often get short-circuited, especially in a down economy. Facility managers are more aware of the benefits of efficiency improvements than ever, but investment levels have not enjoyed a similar increase, [according to a survey by Johnson Controls](#). Seventy-two percent of respondents said they pay more attention to energy efficiency, up 10 percent over the year before. But the number of those who expected to make capital investments in the area remained flat. Similarly, another study found that while more commercial real estate executives are seeking greener office space, [they are less inclined to pay premiums](#) for it.

4. Universities Take Class Actions

Colleges and universities around the world have long been reducing their environmental footprints, engaging in the same long list of efficiency, recycling, and source-reduction activities taking place among their corporate counterparts. But the greening of the curriculum has lagged. Indeed, a [study by the National Wildlife Foundation](#) found that while campus administrators are ramping up their commitments to reduce their schools' environmental impacts and making significant changes in day-to-day operations, environmental academics haven't kept up, and may have declined since 2001. That dearth of green education is of growing concern to companies seeking to recruit the next generation of leaders who understand the business value of environmental thinking.

That's starting to change, as a number of universities launch sustainability programs. During 2008, for example, [four Ohio campuses launched](#) an advanced energy master's degree program in a bid to train the next generation of highly skilled, green collar workers. The University of Dayton and Wright State University will award the two-year degrees, while Central State University and Air Force Institute of Technology will offer classes. A [new program offered by the University of Pennsylvania's](#) Wharton School and School of Arts and Sciences is enabling graduate students to earn a dual master of business administration-master of environmental studies degree. The [University of Maine Business School](#) launched a Master of Business Administration and Sustainability program. And the first doctoral degree in sustainability was launched at the [Rochester Institute of Technology](#), with the goal of advancing research and education in alternative energy development, sustainable design, green product development, industrial ecology and pollution prevention.

This isn't merely academic. As programs proliferate, so too does competition, along with guides and rating systems that help prospective students figure out which schools move to the head of the class. The venerable Princeton Review debuted [green ratings for 600 colleges](#) after it found that 63 percent of college applicants surveyed said they would value having information about a college's commitment to the environment and that such data could affect their choice to apply or attend a school. The Aspen Institute offered a [Guide to Socially Responsible MBA Programs](#), which evaluates and ranks 130 MBA programs based on their business teachings, among other factors. GreenReportCard.org [published detailed information](#) on the green and not-so-green aspects of 300 colleges and universities; only 15 received the highest grade, an A-minus.

Meanwhile, the greening of campuses themselves continued to receive high marks. The Association for the Advancement of Sustainability in Higher Education [launched a rating system](#), called Sustainability, Tracking, Assessment and Rating System (STARS), on more than 90 college and university campuses, bringing attention to the environmental impacts of everything from buildings to food programs to education, and to developing ways to make campus life more sustainable. At last, the green learning on campus is beginning to take place among maintenance workers, cafeteria staff, facility managers, and landscaping crews — not just students.

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STATE OF
GREEN
BUSINESS
2009

Two surveys of workers, one in the U.S. and another in the U.K., found that workers are largely dissatisfied with their company's environmental achievements.

5. Green Moves Up, and Down, the Chain of Command

Environmental issues have been garnering top-level attention for years — “Get CEO buy-in,” is a well worn piece of advice for aspiring corporate environmentalists — but for many companies, getting the CEO on board is the least of the challenges. Failure to engage the rank and file — not to mention that all-too-often impenetrable layer of resistance known as “middle management” — has thwarted even the more forward-thinking business leaders from realizing their green goals.

Companies are finding new ways to make green thinking top of mind for employees, both at work and in their personal lives. Wal-Mart has [engaged its employee base](#) by asking them to create Personal Sustainability Projects, helping them connect personal and corporate missions to make a difference for their own health and the health of the planet. The PSPs — which range from picking up litter and switching out inefficient light bulbs, to smoking cessation and weight loss — help motivate and energize employees; teach them how to cut out the fat, literally and figuratively; improve their health and morale; and may even reduce Wal-Mart's health-care costs for its more than one million employees. The idea is that employees [often connect to the broader concept of sustainability](#) through the prisms of finances and health and wellness, not just saving the birds and the trees.

Other companies are taking different routes. For example, JCPenney enlisted the help of [volunteer “energy captains”](#) at each of its 1,000-plus retail stores, asking them to be the eyes and ears on the ground to look for more ways to conserve energy and green their workplace.

Much of this taps into employees' natural desire to be part of environmental solutions, and to be empowered to do so by their employers. A [2007 survey by Adecco](#), an international human resources company, found that 52 percent of employed adults felt their companies should do more to be environmentally friendly; companies, for their part, wanted to highlight their green activities to market themselves and attract new employees. A classic win-win.

But it's not all smooth sailing. [Two surveys of workers](#), one in the U.S. and another in the U.K., found that workers are largely dissatisfied with their companies' environmental achievements. The U.K. survey found that big companies often hamper employees' willingness to take green actions, with those at smaller firms significantly more likely than employees at larger companies to help curb energy use and climate gases by recycling and turning off lights and computers. Stateside, a survey of workers by the Marlin Co. found that 63 percent considered themselves to be greener than their employers.

That's not encouraging. To achieve their increasingly ambitious environmental goals, companies will need to educate, engage, empower, and activate their employees to think and act green. And learn from them, too, recognizing that when it comes to running a leaner, greener business, no one knows where the waste and inefficiencies lie more than those on the front lines. Despite all the oft-repeated dictums about “top-down” and “bottom-up” management techniques, effectively greening the corporation sometimes requires that companies learn how to lead from the middle.

Green Management in a Blue Economy

The slumping economy doesn't bode well in the coming year for corporate environmental strategy — or does it?

In late 2008, John Davies, Vice President of GreenBiz Intelligence, surveyed more than 100 companies to determine the influence of current economic conditions on their green strategies and spending priorities, specifically in the areas of green products, environmental budgets, and other topics. The survey was produced for the [GreenBiz Executive Network](#), a peer-to-peer learning forum for sustainability professionals, which Davies runs.

The responses — 73 percent of which were from Fortune 500 firms representing a range of sectors — was encouraging, or at least unexpected. Companies said they are increasingly investing in green product development, with nearly 47 percent increasing their investments this year; fewer than 6 percent said they plan to invest less this year than last.

While consumer goods manufacturers and retailers led the way, executives in most sectors said they would be increasing their investments in green product development during 2009.

We were also encouraged that big-company environmental budgets aren't being slashed, as they have been in other economic downturns. The GreenBiz Intelligence survey found that 46 percent of companies' environmental, health, and safety budgets will remain the same in 2009 as in 2008, while more than 27 percent said their budgets will grow this year; only 26 percent said their budgets were reduced. Similarly, only 6 percent said that they plan to reduce headcount in their departments during 2009. (On the other hand, more than 85 percent said they are not hiring, either.)

When asked what their No. 1 initiative was for 2009, nearly 4 in 10 answered "Reducing energy use through efficiency." In second place: "Making sure that green stays on the agenda."

Amen to that.

Nearly 47 percent of companies surveyed said they were increasing their investments in green product development in 2009; less than 6 percent said they'd be investing less this year than in 2008.

6. Product Stewardship Creates a Material Change

Suddenly, solid waste is back — literally and figuratively. The combination of lean times and growing concerns about hazardous and nondegradable waste have made it more necessary, and more profitable, for companies to engage in a range of strategies and activities cumulatively known as "product stewardship."

Simply put, product stewardship requires that companies retain responsibility for their goods long after they sell them — and even after the goods have outlived their useful lives. That means making sure that products and packaging contain ingredients and materials that are least harmful to people and the environment, and that these things are disposed of in ways that don't cause harm.

In November, two groups announced a new e-Stewards partnership with 32 electronics recyclers in the U.S. and Canada that agreed to refrain from some of the more egregious e-waste practices.

A growing amount of the action has to do with reducing materials and packaging in the first place — the first “R” in the “reduce, reuse, recycle” hierarchy known these days by nearly every school kid. Jurisdictions (such as [San Francisco](#) and [New York state](#)), retail chains (such as [Whole Foods](#) and [IKEA](#)), even entire countries (such as [China](#)) are banning problematic materials, such as styrene foam takeout containers and plastic shopping bags, among other things that cause litter and don’t degrade in landfills.

Increasingly, many of these activities are being codified by local jurisdictions. Product stewardship councils in Vermont and British Columbia have [adopted the “Joint Framework Principles for Product Stewardship Policy,”](#) with the aim of shifting the burden of disposal from governments and taxpayers to producers. At its meeting in July, the National Association of Counties [passed a resolution](#) supporting an extended producer responsibility framework for its members.

Some companies aren’t waiting to be told what to do. Computer manufacturers like Dell and Hewlett Packard have redesigned packaging to create less waste and lower costs. Dell, for example, said it [planned to eliminate 20 million pounds of packaging](#) worldwide within the next four years, a move expected to save about \$8 million. HP, for its part, accepted a challenge from Wal-Mart to reduce material use and waste by [introducing a notebook PC](#) in a recycled laptop bag with 97 percent less packaging than typical laptops.

Of course, what goes inside those computer packages has also become a focus of product stewardship advocates. Used computers and other so-called e-waste continue to plague landfill managers with its lode of unrecyclable and toxic materials, many of which have been banned from landfills in some jurisdictions. Last fall, the U.S. Congress excoriated federal regulators for [failing to enforce existing laws](#), let alone create tougher ones. Consumer electronics companies have been taking action, perhaps to avoid more punitive measures. Some are forming partnerships with retailers and waste haulers — such as [LG’s partnership with Waste Management](#) — to create e-waste recycling centers and drop-off points, hoping that such voluntary efforts will stave off regulatory mandates.

Activists are leading the charge. In November, [two groups announced](#) a new e-Stewards partnership with 32 electronics recyclers in the U.S. and Canada that agreed to refrain from some of the more [egregious e-waste practices](#). More e-waste laws are [forthcoming in 2009](#). E-waste policies and practices are now a [criterion for grading companies](#) — not just makers of computers and other IT equipment, but [also TVs](#), which are heading to landfills in increasing numbers in advance of the planned U.S. phase-out of analog TV broadcasts in 2009.

The recession is putting a crimp in many of these efforts. The [dramatic drop in demand](#) for materials worldwide has dampened the prices of recycled materials in tandem with those of their virgin counterparts. That’s led recyclers to [stockpile materials](#) that are no longer profitable to recycle. It’s one step forward, two steps back: At the same time that new laws and corporate voluntary initiatives aim to ramp up product stewardship, thereby increasing the quantity of recycled feedstocks, recyclers will be forced to endure a tough economic climate.

7. Green Marketing Suffers a Failure to Communicate

A rise in green marketing efforts has been matched by a nearly equal rise in claims of greenwashing by [activists, bloggers, and others](#). Increased concerns about energy, climate, toxics, and other environmental issues have led some of the largest consumer brands to enter the green marketplace, prodded by retailers such as Wal-Mart, which has been pushing suppliers to offer affordable green products. But with the new players and products has come a new wave of claims about greenwashing, or at least public frustration that companies aren't doing enough, aren't telling their stories well, or both.

Green claims have continued to grow. An [Earth Day report](#) revealed that 2007 saw the largest number of green trademark applications since 2000, according to the U.S. Patent and Trademark Office: More than 300,000 applications for green brand names, logos, and tag lines. Companies like [Apple](#), [Canon](#), [Clorox](#), and [Fiji Water](#) entered the green marketplace for the first time, raising awareness — but also questions and, sometimes, controversy. Given the lack of definitions, just about anything can be claimed as “green” — or “greenwash” — [further muddying the waters](#).

One problem is that consumers are [ambivalent at best](#) about shopping green. They claim they want to, but they also say that they don't trust companies. For example, surveys show that the number of people concerned about climate change continues to grow, and that consumers believe [businesses should bear the heaviest load](#) in addressing it, but they [aren't convinced](#) that the business sector is doing as much as it should. Marketers aiming to shift their audiences toward making greener purchasing decisions are coming up short for the vast majority of the population, although a [small subset is green enough](#) to help

In 2007, the U.S. Patent and Trademark Office saw more than 300,000 applications for green brand names, logos, and tag lines.

Select Green Market Research Headlines of 2008

[Americans Trust Green Claims, But Support Government Oversight](#)

[Bloggers, Consumers Quick to Spot Greenwashing](#)

[Survey: Top Choice for Truly Green Brand is Nobody](#)

[Most Overwhelmed by Green Marketing, New Studies Find](#)

[Green Marketing Failing, Says Report](#)

[Most Consumers Can't Name a Green Brand](#)

[Big Companies Can Make it Harder for Employees to Help Go Green](#)

[Study Says Consumers Stay Loyal to Brands That Do Good](#)

[Big Companies Can Make it Harder for Employees to Help Go Green](#)

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STATE OF
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2009

U.S. investors filed nearly twice as many shareholder resolutions with companies that could encounter adverse business impacts from climate change.

spread the environmental awareness on their own, according to one study. Although about half of those in another survey said they trust companies to be truthful in their environmental marketing and believe companies are accurately presenting information about their impact on the earth, nearly 60 percent would like to [see more government regulation](#) of green claims to ensure they are accurate. Given the Federal Trade Commission's [review of green marketing claims](#) launched last year, they just might get it.

The upshot is that despite the continued upswing in green business activity, there's no concomitant rise in consumer awareness or trust. Case in point: With no prompting, nearly half of all [respondents to one survey](#) were essentially unable to name a single feature of a green home — not solar power, compact fluorescent light bulbs, home recycling, or Energy Star-labeled appliances. And when readers of Brandchannel.com were asked [what brand they think](#) of as truly green or going green, the top answer: none at all.

8. Carbon Becomes a Business Imperative

The year 2008 will likely be looked back upon as a time when carbon emissions became core to mainstream business. Of course, companies had been warming to the realities of climate change for years, with many firms making significant commitments and reductions in their greenhouse gas emissions. But things have heated up. Perhaps it was the 2008 U.S. presidential elections, in which the major candidates pledged to — finally — bring the U.S. into the community of nations in recognizing the need for carbon regulation. Perhaps it was the impatience of major corporations seeking to engender regulatory certainty into their strategies and investments. For whatever reason, climate change has finally become a business imperative.

As in years past, companies continued to make substantive commitments to reduce their carbon footprints. A wide range of companies — [Alcoa](#), [AMD](#), [Best Buy](#), [Cisco](#), [Deloitte](#), [DHL](#), [Hess](#), [JohnsonDiversey](#), [JPMorganChase](#), [Matsushita](#), and [Merck](#), just to name a few — variously promised to slash emissions, increase reporting, or hew to a set of climate principles.

But 2008's climate stories revealed a deeper truth: Carbon is now, and probably forever, part of the corporate landscape. Demands came from outside companies — U.S. investors filed nearly [twice as many shareholder resolutions](#) with companies that could encounter adverse business impacts from climate change — and from companies themselves: Levi Strauss, Nike, Starbucks, Sun Microsystems, and Timberland partnered with the nonprofit Ceres to [create a business coalition](#) to lobby Washington for stringent climate change legislation. In December, deep into a global banking crisis, five major global financial institutions agreed to [adopt a new framework](#) to guide the sector toward addressing and managing climate change across their products and services.

One center of activity was California, which [released its Climate Change Draft Scoping Plan](#), a wide-ranging proposal for reducing greenhouse gas emissions to 1990 levels by 2020 using a variety of measures that will touch every sector of the state's economy. But it wasn't all as Draconian as it seemed: Cutting

Corporate Climate Commitment Headlines of 2008

[AMD Aims for Lower Emissions, Greener Products](#)

[BT Makes a Big Climate Commitment](#)

[Cisco Aims to Cut Emissions by a Quarter](#)

[Energy East Halves Emissions, Vodafone Plans Same](#)

[Energy Efficiency Saves Dell \\$3M](#)

[Exelon Looks to Cleaner Energy Generation to Cut Emissions](#)

[JohnsonDiversey to Invest Millions to Cut Carbon Footprint](#)

[JPMorgan Chase Shoots for 20 Percent Carbon Reduction](#)

[Millipore to Cut Carbon Footprint by 20 Percent](#)

[National Grid Wants to Slash Emissions 80 Percent by 2050](#)

[PricewaterhouseCoopers to Cut CO2 by a Fifth](#)

[Sun, Caterpillar, Mack Trucks and Pfizer Honored for Cutting GHGs](#)

California made it mandatory for cars to be labeled with global warming scores, figures that take into account emissions from vehicle use and fuel production.

greenhouse gas emissions in California will likely boost the state's economy, create thousands of green collar jobs, and increase personal income, a [state analysis found](#). Another center of climate activity was in Europe, where the European Parliament environment committee [laid the groundwork](#) for an aggressive climate change roadmap that will guide its 27 member states through 2020.

Part of the new corporate climate involved more disclosure to consumers about the carbon content and impacts of their purchases. In the U.K., a new standard was released to help companies there [assess the environmental impacts](#) of their goods. One exemplar was the supermarket chain Tesco, which [began labeling products](#) with information related to their greenhouse gas emissions. Japan followed suit, saying it would [introduce carbon footprint labels](#) for consumer products ranging from laundry detergent to beverages. In the U.S., [California made it mandatory](#) for cars to be labeled with global warming scores, figures that take into account emissions from vehicle use and fuel production.

All of which represents a huge business opportunity — \$300 billion annually in goods and services aimed at battling climate change, a sum surpassing the biotech and software sectors combined, [according to one study](#). Another financial impact may be in CEO paychecks: As climate change moves to the forefront of corporate awareness, one study found leading U.S. businesses starting to [tie the non-financial performance](#) of their companies to their compensation metrics.

Info tech is one industry experiencing a “race to the top,” in which companies are both cooperating and competing to create high standards of performance.

9. Information Technology Plugs Into Green

Information technology has been both a hindrance and help to the environment — on the one hand, dematerializing commerce and increasing efficiencies; on the other, becoming a voracious consumer of energy. Indeed, today’s biggest energy gluttons aren’t necessarily steel mills and auto factories, but rather the Googles, Amazons, and eBays of the world. Their fast-proliferating data centers can use as much electricity as a small city. Energy use is both an economic and environmental liability for the IT industry and, to the extent its energy appetite is stressing electricity grids around the world, it may become a social liability, too. [One study found that](#) unless the IT industry starts taking advantage of power-saving features and build with an eye toward energy efficiency, the global impact of IT will eclipse the total emissions of the United Kingdom.

The greening of IT has become a huge business opportunity, as companies find ways to consolidate and optimize operations in ways that provide multiple benefits: lower energy use, equipment costs, real estate, and personnel — all while maintaining or growing their data processing and storage capacity.

For example, Hewlett Packard last year [completed an audacious revamp](#) of its global IT platform, shaving total spending from about 4 percent of its annual revenue to below 2 percent — a savings of about \$1 billion a year. The savings come partly through consolidating its network of data centers dramatically — going from about 85 facilities to just six and cutting energy consumption by 60 percent — even while its overall computing capability more than doubles. And it’s not just the big guys. A [survey by IDC](#) found that even the smallest businesses are undertaking green IT initiatives.

All of which is creating a boom market for energy-efficient computers, servers, printers, routers, and dozens of other products, not to mention software and services aimed at consolidating multiple machines — “virtualization,” in geek-speak. Eco-labels like [EPEAT](#) and [Energy Star](#) are helping buyers identify products that meet efficiency standards, and some companies are creating their own labels. Fujitsu [announced its own certification](#), asserting that existing labels are not broad enough. Its label goes beyond energy to include whether products are made halogen-free and without brominated flame retardants and polyvinyl chloride, among other things. Verizon [created its own efficiency metrics](#) to push equipment manufacturers to make products such as broadband, data center, network, and customer devices 20 percent more energy efficient.

This is one industry experiencing a “race to the top,” in which companies are both cooperating and competing to create high standards of performance. The Green Grid, a global consortium of IT firms, proposed “miles-per-gallon” type [standardized metrics](#) that allow firms to compare the efficiency of competing servers, storage systems, and networking equipment. The European Commission issued a [detailed set of efficiency benchmarks](#) to guide IT managers as they build new data facilities or upgrade existing ones.

The potential is significant if the green IT industry gets this right: A McKinsey report says green IT can help [eliminate 7.8 metric gigatons of greenhouse gas emissions](#) annually by 2020, equivalent to 15 percent of global emissions today.

10. Greener Design Comes Out of the Lab

Concerns over toxics in everyday consumer products, as well as in the environment, ramped up during 2008, as companies faced continued threats of tainted toys and other products manufactured both at home and abroad. The threat was at times mind-boggling: A [study of 1,500 toys](#) tested for toxic substances found that 1 in 3 had significant levels of lead, mercury, cadmium, or other chemicals. Concerns ranged from [lead in lipstick](#) to [mercury in medicine](#) to [BPA in baby products](#), among dozens of other problematic products. Highlighting the risks from harmful materials in products, toy maker [Mattel](#) [settled for \\$12 million](#) a lawsuit brought by 39 states after some of its toys were found to contain dangerous levels of lead.

Along with the growth of concern has come a growing number of solutions, a small but promising toolkit of chemical alternatives and design strategies aimed at wringing out the most toxic ingredients — and, at the same time, improving some products' performance characteristics.

An emerging field called "green chemistry" enjoyed the limelight in 2008, as California [enacted a law](#) giving its Department of Toxic Substances Control the power to set up a framework for dealing with chemicals of concern, instead of on a substance-by-substance basis, the current model that often leads to contentious legislation or litigation.

The need for green chemistry is clear. There continue to be substantive gaps in understanding the health and environmental effects for the great majority of the 83,000 chemical substances listed in the federal government's inventory. And

Toxic concerns ranged from lead in lipstick to mercury in medicine to BPA in baby products, among dozens of other problematic products.

Select Green Product Design Headlines of 2008

[Amazon.com Takes Waste and Frustration Out of Packaging](#)

[Apple Releases Product Lifecycle Data](#)

[Brita Finds New Life for Used Water Filters](#)

[California EPA Releases Final Green Chemistry Framework](#)

[E.U. Calls for Easily-Removable Batteries, Sets Recycling Rates](#)

[HOK, Biomimicry Guild Partner to Bring Nature to Cities and Buildings](#)

[Nike's Considered Design Seeps Into More Products](#)

[Researchers Develop Light, Tough Ceramics by Copying Mother of Pearl](#)

[Tata Motors in Talks to Make Micro-Hybrid Version of Nano](#)

[Toyota Aims for More Plant-Based Car Parts](#)

[Toys 'R' Us Unveils New Line of Green Toys](#)

[Wal-Mart Announces Future of Packaging Scorecard](#)

STATE OF
**GREEN
BUSINESS**
2009

HOK, one of the world's largest architecture firms, formed a partnership to incorporate cutting-edge ideas from nature into its designs for buildings, towns, and cities.

over the past 20 years, more than 20,000 new substances have been added to the inventory, as global chemical production continues to grow at about 3 percent per year. Green chemistry — the science of [addressing pollution prevention at the molecular level](#) — seeks to find safer alternatives.

A few companies have been doing some version of this for years. SC Johnson, for example, the maker of consumer products ranging from Glade to Raid, has been gradually and systematically substituting safer chemicals for toxic ones, a protocol it calls [Greenlist](#). Using Greenlist, the company managed not only to eliminate a chemical it deemed unacceptable in its Windex glass cleaner, but also to improve the product's cleaning power by 30 percent. All told, Greenlist has enabled SC Johnson to remove more than 61 million pounds of smog-producing volatile organic compounds from its products and earned the company a Presidential Green Chemistry Award. Meanwhile, a smaller competitor, Seventh Generation, aiming to promote full disclosure, introduced a [downloadable label-reading guide](#) to help consumers understand ingredients in common cleaning products, a searchable and browsable list that explains what each ingredient is, what it is used for, and what effect it has on the environment and human health.

Another blossoming design principle, [biomimicry](#), also gained attention in 2008. A handful of large companies — including Boeing, Herman Miller, Interface, and Nike — have begun utilizing biomimicry, which harnesses nature's design solutions for industrial processes, as a design tool. Carpet giant Interface reportedly reaps about a third of its roughly \$1 billion annual revenue from its Entropy line of carpet tiles, which were inspired by biomimicry principles. HOK, one of the world's largest architecture firms, [formed a partnership](#) to incorporate cutting-edge ideas from nature into its designs for buildings, towns, and cities.

The promise of greener design strategies is bringing companies together to leverage knowledge and forge solutions. More than 50 leaders from businesses and non-governmental organizations [came together](#) last year to focus on making consumer products less toxic and with sustainable ingredients. The group is encouraging companies and their supply chains to adopt its guiding principles, which call for disclosing chemical ingredients, avoiding hazardous chemicals, creating a framework for reviewing chemicals, and supporting appropriate policies and standards.

Such partnerships, among companies as well as with activists and government agencies, represent the hallmark of a healthy green business ecosystem, a platform for innovation — from which the next generation of cleaner and greener policies, processes, and products will likely emerge.

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

In the spirit of continuous improvement, this year's index includes several new indicators, while several have gone away. In a handful of cases, indicators are measured differently this year than last, though the change of measurement is consistent — that is, we've "backcast" the methodology to ensure we were comparing data in a consistent way, year over year.

Much of this has to do with the vagaries of the world of data in general, and in environmental data in particular. Data gathering by government comes and goes, due to funding, political mandates, reorganizations, and other reasons. It's not just government: Research companies that had been collecting information a certain way for years may stop doing so (or may change their methodologies), causing us to find new sources to factor into our calculations and analyses.

And new data become available. So, for example, at the end of last year's report, we published a box on "Indicators We Wish We Had," five buckets of information we looked for but couldn't find. This year, we're pleased to include two of those indicators — green job growth and the water efficiency of our economy, both due to the recent availability of data sources.











In aggregate, we're proud of the result. The GreenBiz Index continues to fill an information void about the environmental impacts U.S. companies are making as they integrate environmental thinking into their operations and strategies. The story it tells is one of incremental change — too incremental, in many cases, to result in meaningful progress in reducing the energy, water, materials, carbon, and toxic intensity of the U.S. economy and, in the process, sufficiently lighten the private sector's environmental footprint.

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













We're not standing still. We look forward to your comments about the Index and will continue to improve each year its ability to help us ask better questions.

The GreenBiz Index — Summary

Topics	What We Measured	What We Found	Swim/Tread/Sink
Building Energy Efficiency	Average energy use per square foot of office space	Steady, if slow, improvement	
Carbon Intensity	Emissions of greenhouse gases per unit of GDP	Slowest improvement rate since 2002	
Carbon Transparency	Companies responding to Carbon Disclosure Project	Slow growth, but not keeping up with rest of the world	
Cleantech Investments	Venture capital investments in clean technology	Strong, steady growth, more than double a year ago	
Clean-Energy Patents	Patents issued by U.S. Patent Office	Continued strong growth	
Corporate Reporting	Number of reports from S&P 500 companies	Improvement, but pales compared to other regions	
Employee Commuting	Number of workers driving solo, carpooling or using mass transit	Americans slow to give up cars, mass transit inches up	
Employee Telecommuting	Number of U.S. telecommuter households	Creeping along with little change	
Energy Efficiency	Energy use per unit of GDP	Steadily getting more efficient	
E-Waste	Percentage of recovered equipment	Still getting buried under growing mountains of waste	



Topics	What We Measured	What We Found	Swim/ Tread/ Sink
Financial Impacts	Environmental damage costs as a percent of economic output	Gradual improvement, though tapering off	
Fleet Impacts	Estimated annual greenhouse gas emissions per vehicle	Uneven improvement	
Green Jobs	Number of existing green jobs	Measured growth despite overall employment trends	
Green Office Space	LEED-certified commercial building space	Fewer finished projects, but lots of new commitments	
Green Power Use	Renewable energy as a percentage of all electricity generation	Slowly increasing, but gains offset by electricity growth	
Packaging Intensity	Materials used per unit of GDP	Slightly increased improvement from previous year	
Paper Use and Recycling	Paper use and recycling per unit of GDP	Paper use continues down while recycling rate keeps climbing	
Toxic Emissions	Toxic releases per unit of GDP	Continuing an improving trend	
Toxics in Manufacturing	Emission per year of 20 bioaccumulative and toxic chemicals	Erratic usage, not improving, but not getting worse	
Water Intensity	Amount of water used per unit of GDP	Less water used as population and economy grows	

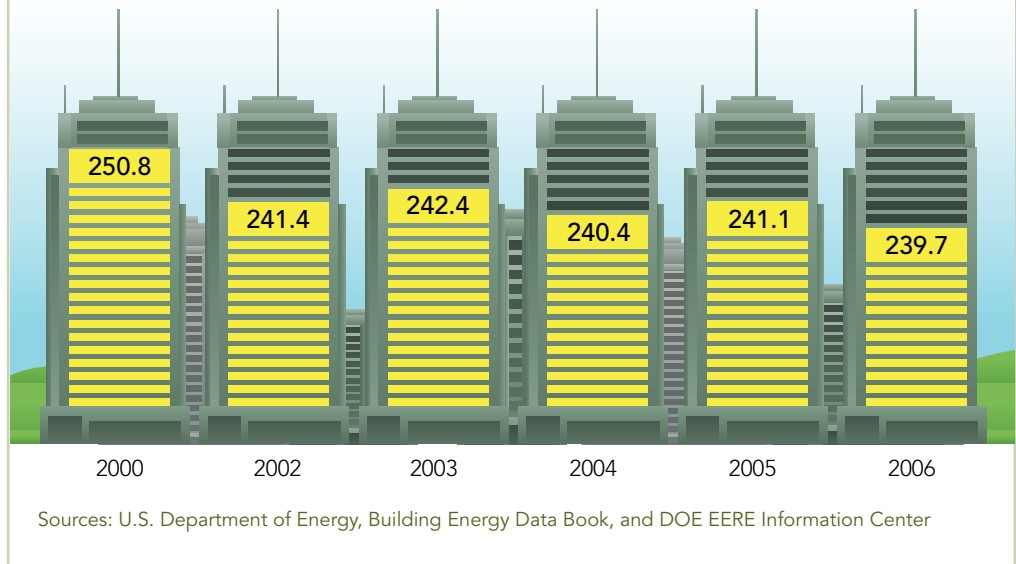


Building Energy Efficiency

Economic Woes Short-Circuiting Ongoing Progress



Energy Efficiency of U.S. Office Buildings 1,000 BTUs per square foot



As the single factor responsible for 40 percent of energy consumption in the United States, buildings — especially commercial buildings — have long been recognized as the keystone of any successful strategy to engender energy independence and stave off severe climate change. And while the data suggest that change is slow in the coming, we expect change to arrive.

The good news is that the trend in building construction as a whole over the course of this decade has been green — or greener — buildings. Between 2005 and 2006, we added 500 million square feet of commercial floorspace to buildings in the U.S., but the average energy used per square foot in those facilities continued to decline. This is a notable achievement, considering that the vast majority of building owners did precisely nothing to improve the efficiency of their facilities in that year; rather more energy-efficient technologies crept into buildings whether they're sought or not.

Although most builders and owners are not green-minded, their numbers are shrinking: As we found from our research into the growth of LEED-certified buildings (see page 48), interest in green building practices is skyrocketing. Even owners and tenants who aren't jumping into one of the growing green building certification programs — LEED, Energy Star, and Green Globes, to name the top three — realize that there are any number of relatively low-cost and high-impact ways to improve efficiency in buildings of all types.

As a certification that's directed 100 percent at energy efficiency, the growth of Energy Star-rated buildings is both a good place to look and a very encouraging indicator. In the 10 years since its inception, the program has grown rapidly, from 90 buildings certified in 1999 to more than 3,200 in 2008. And during the past year alone, that number grew 230 percent, more than doubling from the 1,400 buildings that certified in 2007.

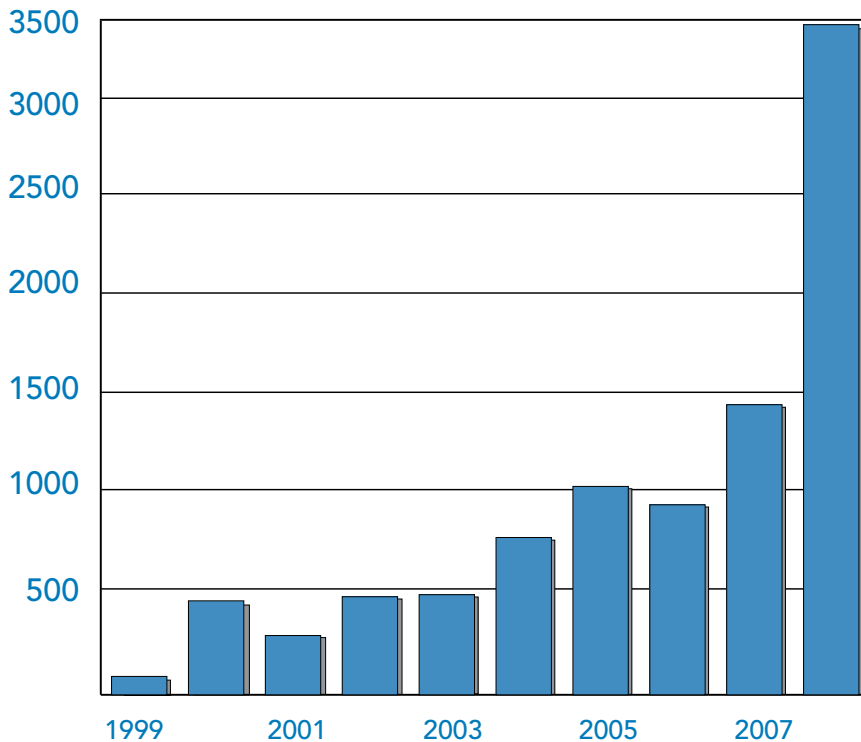
Whether switching to compact fluorescent lightbulbs (or taking it the next step further and transitioning to LED lighting) or installing whole-building controls to maximize energy efficiency, buildings are getting noticeably more efficient. Adding to the progress is the host of appliances, fixtures, controls, and software that fill those buildings: The same Energy Star plaque that companies are adding to the building as a whole is appearing on ever-larger numbers of printers, copiers, computers, refrigerators and heaters and coolers — all resulting in cumulatively less energy needed to get the same or more productivity per square foot of workspace.

Both to the good and the bad, these data are a trailing indicator: With 2006 as the latest year for which we have data, we are still some ways from knowing just how much progress is being made. For example, during the past two years there has been no shortage of good news in green: the Clinton Climate Initiative’s multi-billion dollar goal to green existing buildings; countless corporate initiatives to build new green buildings and improve existing facilities; and legions of energy-sipping products added to the Energy Star roster.

But even as commercial green building booms and companies wake up to the energy savings lying at their feet, the economic woes could bring a stop-work order to much of this progress. The dire straits of the capital markets has turned commercial real estate topsy-turvy, with developers and landlords hoping to hang on to their buildings, let alone green them up. The result is that the industry has been shaken at its foundation — slowing, if not stopping, progress.

The dire straits of the capital markets has turned the commercial real estate world topsy-turvy, with developers and landlords hoping to hang on to their buildings, let alone green them up.

Energy Star for Buildings Certifications



Source: U.S. Environmental Protection Agency

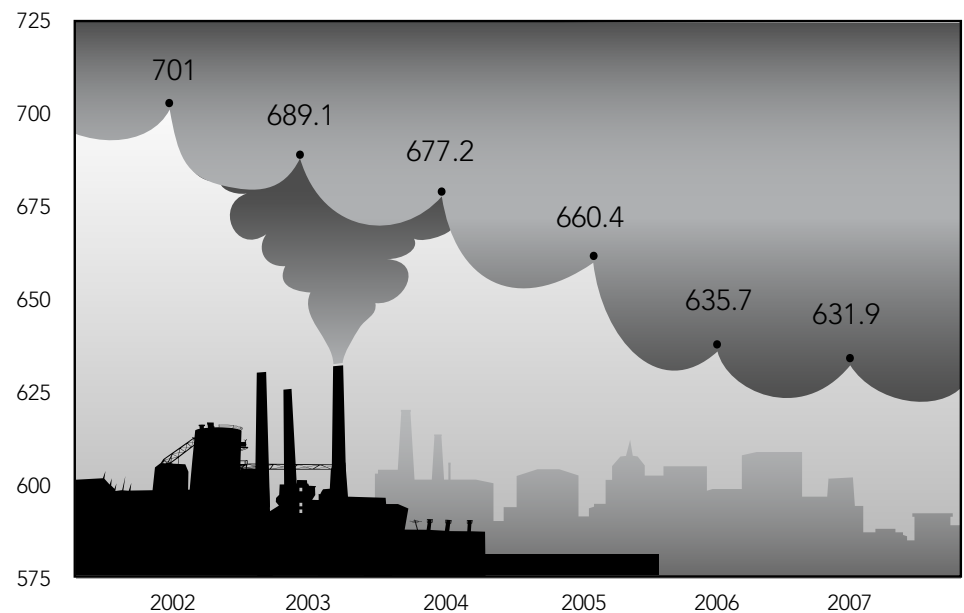
Carbon Intensity

Emissions Cuts
Are Barely Getting
Off the Ground



Carbon Intensity

Million tons of CO₂ equivalent per million dollars of GDP*



Source: U.S. Energy Information Administration

Greenhouse gas emissions in the United States rose in 2007 by 1.4 percent in absolute terms over 2006, but shrank 0.6 percent in intensity — that is, when measured as a percentage of gross domestic product. That's the smallest annual decrease since 2002, when intensity improved 0.4 percent.

The 1.4 percent rise can be traced to two factors: a 14 percent drop in hydropower electricity due to lower rainfall in some areas — requiring more carbon-intensive energy sources like coal to make up the difference — and unfavorable weather, which led more Americans to crank up the heat in the winter and the air conditioning in the summer.

Carbon dioxide comprises the vast majority of greenhouse gas emissions and 98 percent of it is produced by burning fossil fuels for electric power generation and from the burning of transportation fuels like gasoline and diesel. Overall electricity generation rose in 2007, as demand increased for electricity for computers and electronics in offices and homes, as well as for commercial lighting and cooling, and the transportation services spawned by low fuel prices in the past two decades.

Methane emissions — largely from agriculture and landfill gases — also ticked upward in 2007, as well as nitrous oxide, caused in part by increased synthetic fertilizer use from the rising demand for corn-based ethanol. Gases with high global warming potential also inched up, due to their substitution for other gases being phased out to counter ozone depletion.

* 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.

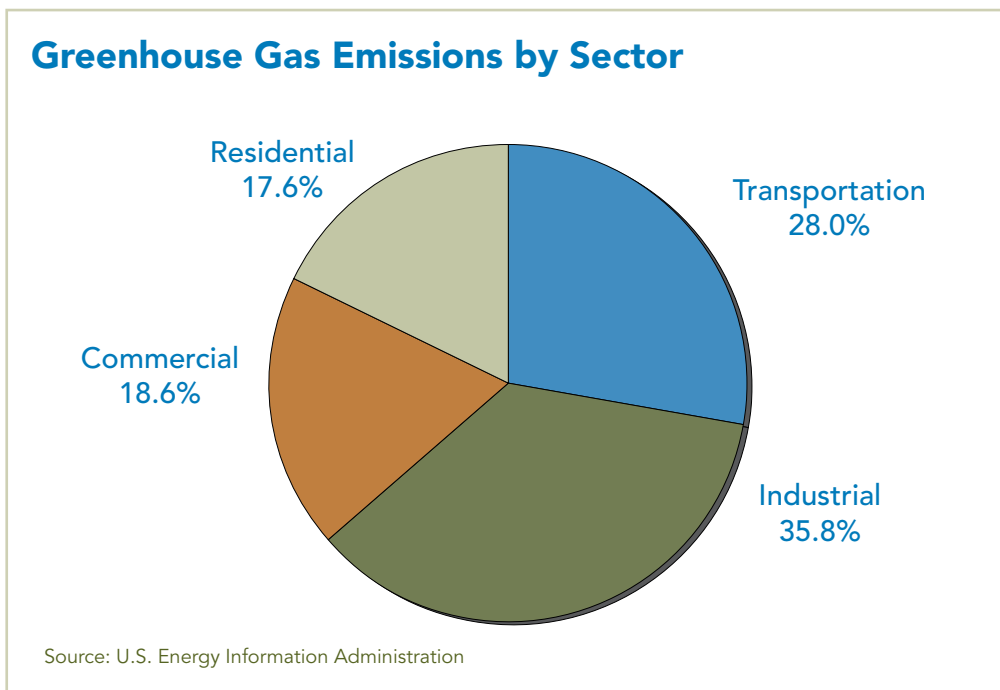
The U.S. has steadily reduced the amount of greenhouse gases produced per unit of GDP since 1990, when intensity was roughly 28 percent higher than in 2007, largely because of strides in energy efficiency. But in absolute terms, 2007 emissions were 16.7 percent higher than in 1990, the level to which President Obama wants to reduce emissions by 2020. The Energy Information Administration estimates worldwide energy-related carbon dioxide emissions will be nearly double 1990 levels by 2030. That's discouraging when one considers the huge emissions reductions scientists say are needed to stem the worst impacts of global climate change.

This will be a pivotal year for climate change legislation in the U.S. and internationally. In December, world leaders will convene in Copenhagen to try to negotiate a successor to the Kyoto Treaty, while in the U.S., Congress is expected to once again debate climate legislation, this time with the support of a more green-minded president. The economic stimulus package promises to promote long-term, climate-friendly policies, such as support for clean energy, mass transit, and energy efficiency. And several states are continuing their efforts to regulate emissions, moving forward with regional cap-and-trade programs.

Amid all this, it remains to be seen whether emissions and greenhouse gas intensity will be shown to have dipped in 2008 due to the recessionary economy, which officially began in late 2007. Energy prices on average were high and volatile in 2008, which led to a drop in demand.

Scientists are warning that emissions need to drop 80 percent in absolute terms by 2050. That won't happen at the current rate of change. It could take a near-complete overhaul of the economy and comprehensive and creative government mandates to get us there.

Greenhouse gas emissions shrank 0.6 percent in intensity in 2007, the smallest annual decrease since 2002.



Carbon Transparency

Increasing Openness to Disclosure



Carbon Reporting

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



Large companies are more aware than ever of the potential risks and opportunities they face from their carbon footprint, and many investors are equally concerned as they come to more fully understand how carbon emissions could increasingly affect profitability and liabilities. One reason for the concern is the rise in carbon regulations affecting companies around the world, including — someday — in the U.S. While there are no mandatory federal regulations in place yet in the U.S., companies are aware that setting a price on carbon is a matter of when, and not if, and that regulations are coming sooner than later.

For the past six years, the Carbon Disclosure Project has surveyed the world's leading companies on behalf of institutional investors, hoping to bring to the forefront just how big of an impact these global companies have on the planet — and how much of an impact climate change could have on companies — to accurately gauge the business risks companies face from climate change and greenhouse gas emissions. In 2008, the CDP sent surveys to more than 3,000 companies. It has posted the detailed responses (or the lack thereof) on its website (www.cdproject.net) for every year of the survey.

With the release of CDP6 in 2008, the sixth annual report, the group shifted its measurement metrics: rather than using the FT500 as its index of choice, CDP now uses the FTSE Global 500 index, a shift that changes the numbers for our indicator. So although fewer U.S. companies responded to the CDP survey in 2008, the percentage is higher than ever — up to 82 percent, from 76 percent last year. North American companies have some room for improvement in overall quality of reporting, however: their average score was 57 out of 100, while European companies scored an average of 69 points.

The bad news is that overall greenhouse gas emissions are rising globally, even as companies are beginning to address their climate impacts more substantively. The good news is that companies are taking into account not just their climate

footprints, but how those impacts further impact their financial footing, and are creating increasingly aggressive programs to limit emissions over time.

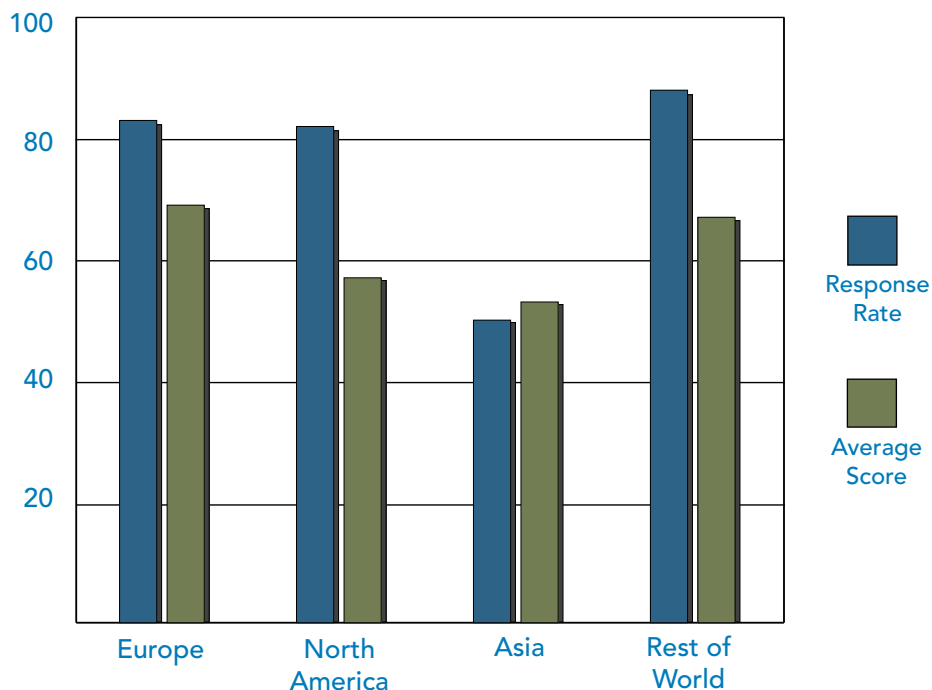
Further encouraging is that, with each year that the CDP conducts its survey, it finds an increase in the quality of reporting: more companies going into more depth — the direct result of companies gaining reporting experience.

For example, respondents to the CDP6 survey were more likely to look beyond their direct emissions — so-called Scope 1 emissions, in the lingo of climate policy (the fossil fuels they burn) — and Scope 2 (emissions from energy they purchased); Scope 3 emissions, which cover indirect emissions from business travel, transportation, supply chains, and product lifecycles, were reported by 47 percent of companies in the Global 500, up from 34 percent in last year's FT500 survey. Scope 3 emissions are significant because they make up a huge segment of overall emissions: For this year's survey, Scope 3 emissions equaled 4.2 billion tons of CO₂ equivalent, nearly 30 percent more than the 3.2 billion tons of emissions from Scopes 1 and 2 combined.

The CDP also is working to make it easier for companies to address their supply chain emissions: In 2008, the group released the preliminary report from its Supply Chain Leadership Collaboration pilot project. That study helped a dozen of the world's largest companies — among them PepsiCo, Dell, Procter & Gamble, and Unilever — survey their suppliers on emissions. As the program expands, CDP aims to bring more large companies and their suppliers into the reporting fold, and we expect participation in CDP and the resulting awareness of carbon emissions to heat up quickly.

Among the encouraging news is that, with each year the CDP conducts its survey, it finds an increase in the quality of reporting — the direct result of companies gaining reporting experience.

Response Rates and Scores, by Region



Source: Carbon Disclosure Project

STATE OF
**GREEN
BUSINESS**
2009

Cleantech Investments

Still Strong,
Bucking the Trend



Investing in Cleantech

Venture capital investments, in billions of dollars



Clean technology investments defied the odds in 2008, purring along like a well-oiled wind turbine.

Venture capital investment in green technologies soared to a record \$7.6 billion, double the previous year, according to Greentech Media. There were about 350 “funding events” in 2008, a phenomenal figure, considering that overall VC investments declined by 8 percent during the year, according to the MoneyTree Report from PricewaterhouseCoopers and the National Venture Capital Association.

Investments in cleantech ranged from early-stage funding of veritable science projects to massive multi-hundred million dollar financings of factories for firms manufacturing solar cells at massive scale. Investments in solar companies, especially those focused on thin-films, concentrated solar thermal, and solar services, were particularly sunny, garnering \$3.3 billion, or more than 40 percent of the total. Investors also showed enthusiasm for next-gen biofuels technologies, like those that make fuels from algae and synthetic biology, making it the second largest cleantech category, with \$904 million in venture capital investments.

Other energy technologies, such as wind, smart grid, and energy storage, continued to receive record amounts of funding. Venture firms invested heavily in biofuels such as cellulosic ethanol and algae, with more than \$1 billion directed toward these new feedstocks and technologies in 2008.

The magnitude of venture capital financing is not an absolute indicator of the health of a sector, says Greentech Media senior analyst Eric Wesoff, but it does represent a number of things such as bullish investor sentiment, increased entrepreneurial activity, and increased technological innovation.

The cleantech sector, which only a few years ago was barely a sector at all, now represents 20 percent of the entire venture capital asset class. At least 30 of the 110 deals during the last quarter of 2008 were seed stage or A rounds — that is, investments in early-stage companies — suggesting that investors still believe the venture capital model works when it comes to clean and green technologies.

Where is all this headed? Like almost everything else these days, it's a mixed picture: growing interest from governments to power up their renewable energy capacity; massive uncertainty in the financial marketplace; green buildings, which require a range of clean technologies, are hot; persistently low oil prices that can sap demand for cleaner vehicles and other alternative energy technologies. Some large-scale projects, such as wind and solar farms and biofuel refineries, which can require hundreds of millions of dollars, are likely to find financing scarce for the foreseeable future.

Most analysts see 2009 as a pivotal year, with a high likelihood that many cleantech start-ups will run out of cash or fail to find markets, thus culling the herd of early-stage companies. Some liken it to the dot-com bust of 2000-01.

But the dot-com bust didn't spell doom and gloom for the Internet. Last we checked, it was alive and well. So, too, could be clean technologies: battered and bruised, but poised for future growth.

Cleantech VC Investments, 2008 (millions)

Solar	\$3,852.8	E-waste and Recycling	\$ 74.8
Ethanol, Biofuels, Gasification	1,043.3	Green Information Technology	50.3
Energy Efficiency, Demand Response, and Smart Grid	701.5	Green Buildings	40.0
Wind	394.0	Carbon and Renewable Energy Credits	36.0
Batteries, Fuel Cells, Energy Storage	366.6	Small Hydropower	35.0
Automotive and Transportation	306.0	Green Agriculture	25.0
Geothermal	220.5	New Coal Technology	9.0
Water	183.5	Environmental Technology	3.9
Lighting	132.6	Misc. Cleantech	19.1
Energy Project Development	96.0	TOTAL	\$7,584

Source: Greentech Media

Venture capital investment in green technologies soared to a record \$7.6 billion in 2008, double the previous year.

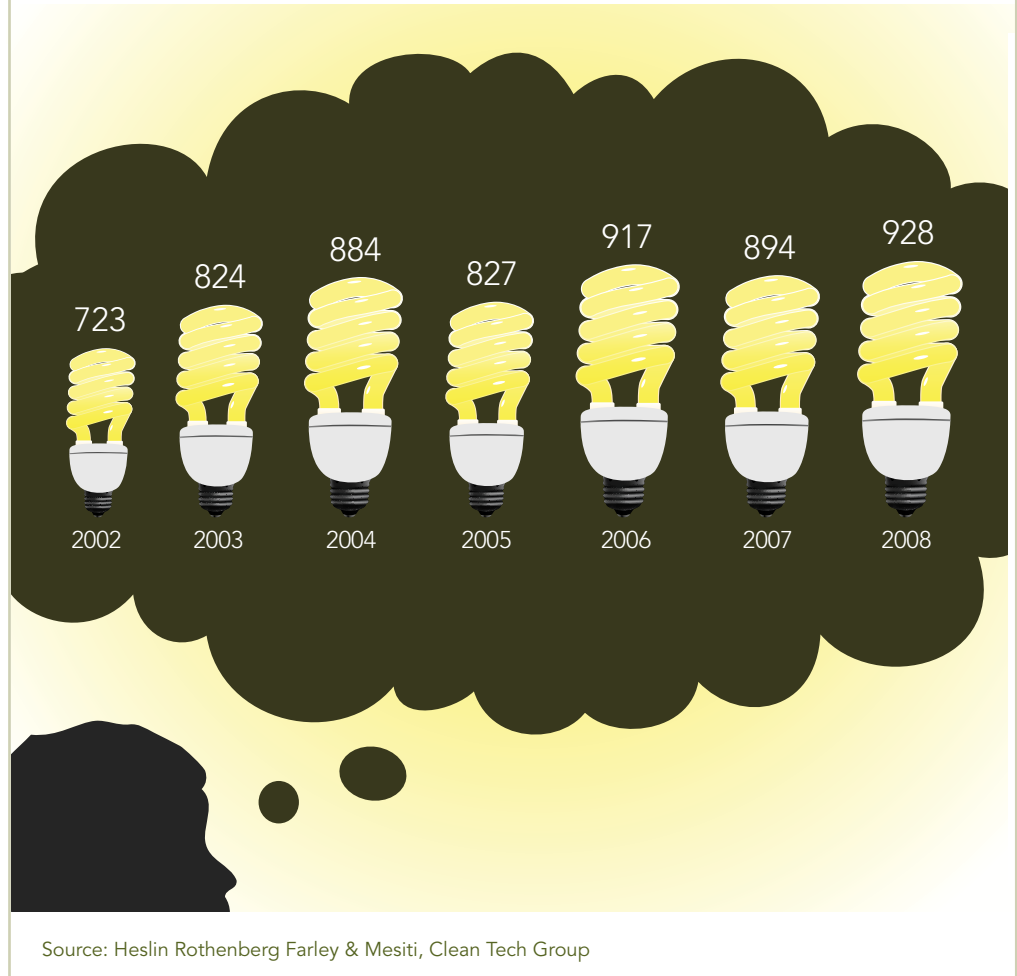
Clean-Energy Patents

Fuel Cells and Wind Show the Power of Innovation



Clean-Energy Patents

Number of patents issued, 2002-2008



U.S. patents for clean-energy technologies in 2008 were at their highest level in seven years, according to the Clean Energy Patent Growth Index, compiled by the intellectual-property law firm Heslin Rothenberg Farley & Mesiti. Patents in wind, fuel cells, hydroelectric, tidal, and geothermal were up in 2008 over 2007, with hydroelectric and tidal patents at all-time highs. In contrast, solar patents decreased slightly in 2008 and continued at a relatively steady pace since 2005. Hybrid/electric vehicle and biomass/biofuel energy patents also fell in 2008.

Fuel cell patents continued to dwarf the other components of the Clean Energy Patent Growth Index in 2008. Automotive companies — including Daimler, Delphi, General Motors, Honda, Nissan, and Toyota — dominated the top 10 fuel cell patent holders, with automobile companies accounting for more than 25 percent of the count. Including the efforts of the car companies, almost 200 different entities obtained fuel cell patents in 2008, vastly exceeding the breadth of patent owners in the other sectors. These other players range from fuel cell manufacturers, such as Plug Power, MTI Micro, Ballard and United Technologies, to universities, such as California Institute of Technology, University of Houston, and the University of Connecticut, to household names, such as Sony and Exxon

Mobil, to the U.S. government. These entities appear to be interested in fuel cells for a wide range of applications, including powering electronic devices, vehicles, homes, and providing backup power, such as for cell phone towers.

Wind patents increased dramatically in the last seven years, to a high in 2008 of 155. The vast majority of the activity in wind patents was driven by General Electric and Aloys Wobben, the owner of Enercon GmbH of Germany. GE claimed the top spot as the holder of the most wind patents since 2002 by adding 37 wind patents in 2008.

Patents are an indicator of both innovation and the financial resources which are typically put into the patent process, explains Victor A. Cardona, co-chair of Heslin Rothenberg's cleantech practice group. The larger number of patents in certain sectors (such as wind and fuel cells) may be attributable to the state of the industry relative to consolidation and the players involved. For example, says Cardona, the wind and fuel cell patent holders are dominated by large companies with significant resources (GE and the car companies, for example), which are able to provide resources to the patenting process while the solar industry is much more diverse with a larger number of patent holders.

Such consolidation is less the case in the solar area, which does not yet have any clear winners, compared to the wind industry, which is more mature and consolidated. As a result, there is less risk in putting resources into the improvements associated with wind and the associated patenting costs. In contrast, the many start-up and emerging companies in the solar sector are more reliant on private venture and government funding, which may be less consistent than corporate funding, which could result in less funding for patenting.

Whatever the reason, the healthy growth of clean-energy patents is an indication of the robust innovation still taking place in the clean-energy field, and a leading indicator of new and more efficient technologies coming into the market in the coming years.

U.S. patents for clean-energy technologies in 2008 were at their highest level in seven years.

Clean-Energy Patents, by Type

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

Source: Heslin Rothenberg Farley & Mesiti, Clean Tech Group

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

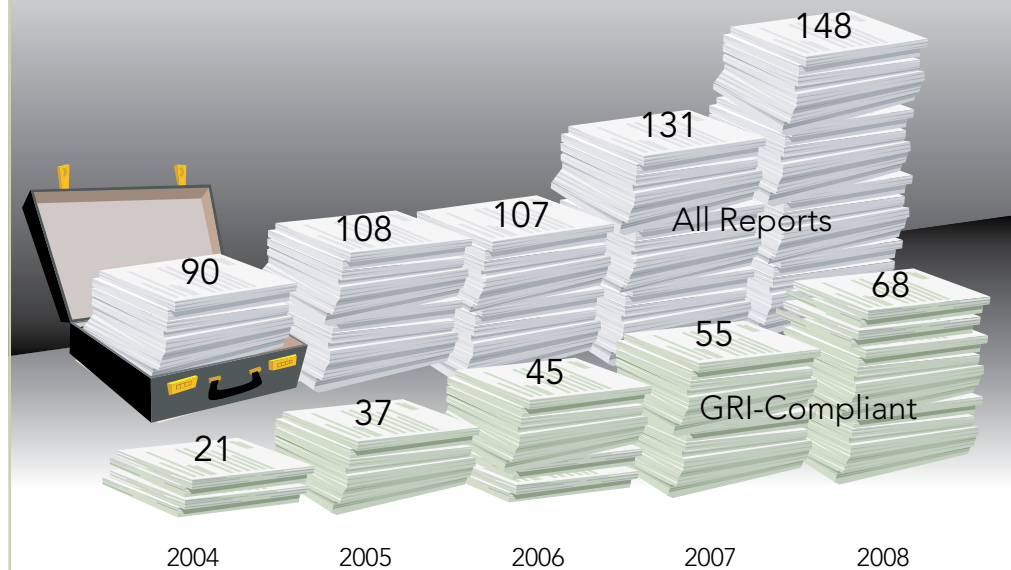
Corporate Reporting

Not Much Progress to Report



Corporate Social Responsibility Reports

Number of reports filed by S&P 500 companies



Source: CorporateRegister.com

Public companies have long produced financial reports to communicate performance and risk to shareholders, but in recent years, disclosures have expanded to include non-financial matters. The resulting reports come with different names and scopes — “sustainability,” “corporate social responsibility,” “environmental,” “citizenship” and “community,” all of which are designed to tell stakeholders what companies are doing to improve their relationships with the environment, employees and communities in which they operate.

Along the way, CorporateRegister.com, a global registry of resources and reports on corporate social responsibility, has tracked the various disclosures, compiling them into a massive database with reports from around the globe. We asked the U.K.-based company to analyze the performance of the U.S. companies listed on Standard & Poor’s 500 index going back five years.

The number of companies publishing non-financial reports with environmental information has increased 64 percent between 2004 and 2008. That’s impressive growth but still accounts for only 30 percent of S&P 500 companies as a whole, up from 18 percent from 2004. That’s progress, to be sure, but barely reflects the increased accountability and transparency asked of companies in recent years by customers, employees, shareholders, and others. Of the 148 reporting companies in 2008, nearly half followed guidelines of the Global Reporting Initiative, a framework that aims to help companies measure and disclose economic, environmental and social performance in a standardized way that allows for comparison of companies across sectors and geographic borders.

A peek behind the numbers shows just 13.5 percent included any kind of third-party verification of the report, a growing requirement of activists and others. Just 6.8 percent featured a United Nations Global Compact Index, 10 principles related to human rights, anti-corruption, and environmental stewardship.

The 64 percent increase in reports filed by U.S. companies lags those in other regions, particularly Europe. For example, CorporateRegister.com compared reporting patterns of the 100 largest companies in the U.S. and Europe in 2008, turning up stark contrasts. Ninety-five of Europe's 100 largest companies filed non-financial reports during the previous two years, compared to 73 U.S. companies. Of these reporters, 72 percent of European companies included external assurance statements, compared to 9 percent of the U.S. reporters.

In terms of quality, U.S. reports may be categorized as either very good or very poor, according to CorporateRegister.com's Iain McGhee. "While there are many great reports, there are many more failing to achieve established best practices," he said. "In the short-term, this quality gap could restrict the usefulness of these reports to key stakeholders. In our current economic situation, the greater risk in the long-term is that as budgets are cut, the value of these reports will be judged by the bad examples rather than the good."

A look at all types of non-financial reports filed over the past five years reveals an evolution from Environment, Health and Safety to "Sustainability" or "Corporate Responsibility" themes — multi-issue reports covering such topics as ethics, human rights and climate change. This evolution can be traced to the 1992 Earth Summit, where the focus shifted from "environment" to "sustainable development." The GRI guidelines reflect this development by encouraging companies to consider other areas of policy and performance, including governance, supply chain and social issues. Oddly, a handful of U.S. companies release only philanthropy reports focusing on corporate donations, which CorporateRegister.com calls a unique American phenomenon.

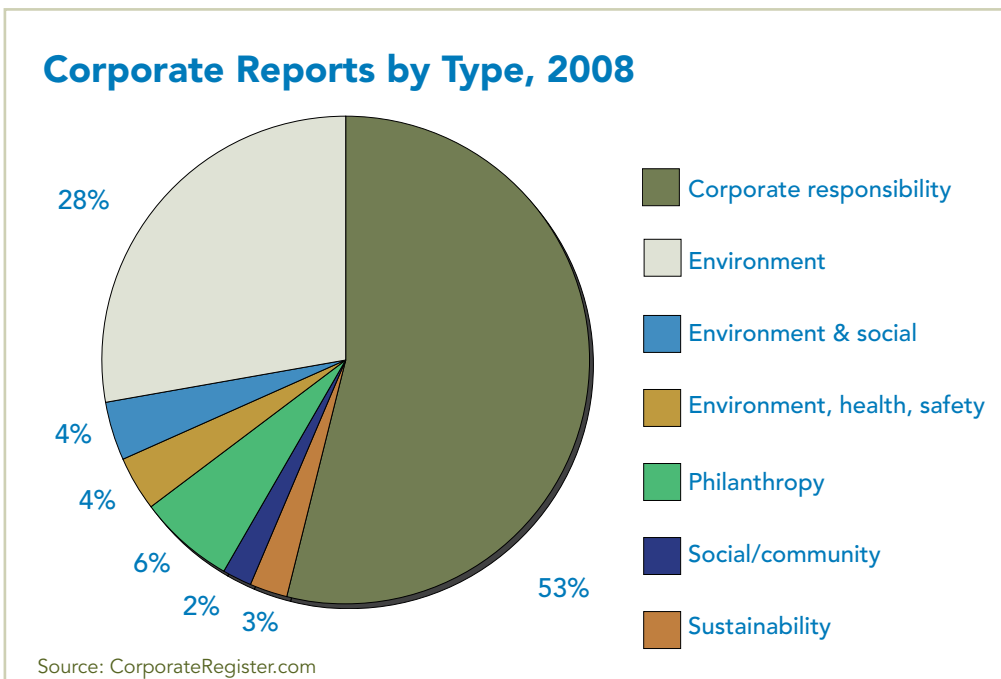
The number of companies publishing reports grew 64 percent between 2004 and 2008, but still accounts for only 30 percent of S&P 500 companies.

CorporateRegister.com (www.corporateregister.com) is the global corporate responsibility (CR) resources website. It hosts the world's most comprehensive directory of CR and sustainability reports, profiling over 19,000 reports worldwide. With an archive stretching back to 1990, it is indispensable for anyone working in the field of CR and sustainability reporting.

Working with some of the leading organizations in corporate responsibility, CorporateRegister.com hosts several official reporting registers. Further site features include a fully searchable directory of over 5,000 organizations ("reporting partners") actively involved in CR reporting.

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

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



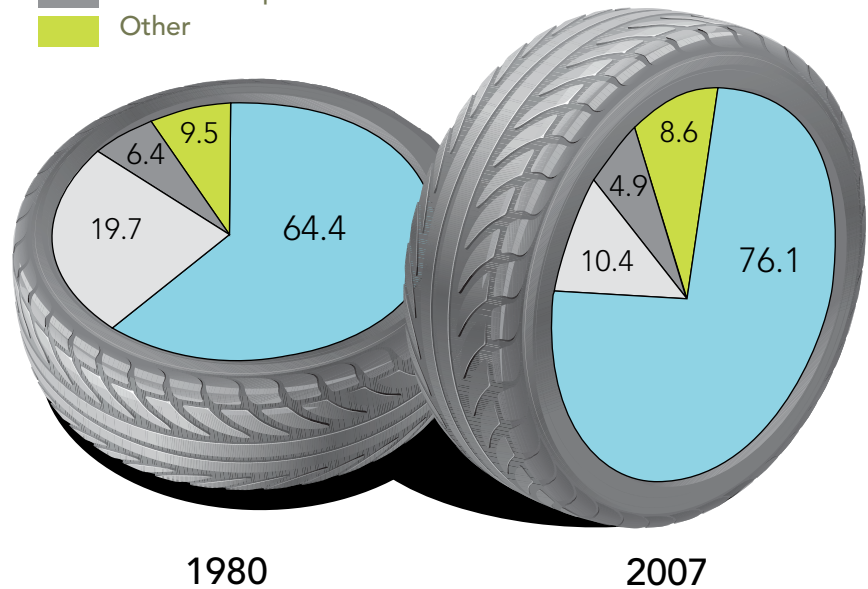
STATE OF
**GREEN
 BUSINESS
 2009**

Employee Commuting

Shifting Gas Prices
Make for a
Stop-and-Go Trip



How Americans Get to Work Mode of commuting, by percentage



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

Americans are continuing their love affair with the car, and appear unwilling to give up their vehicles for the solo commute to work.

That's what the data show us from 2007, the most recent available. Since a high of 77.8 percent in 2003, the number of solo commuters has inched down slowly to 76.1 percent in 2007.

Gas prices topped \$3 per gallon nationwide for a little more than a month in late spring of 2007 before trending lower and rising again in the winter, not painful enough to change our work-related driving behavior in any significant way. But amid the apparent gridlock are other subtle changes, such as gains in public transportation ridership and the first drop in overall vehicle-miles driven since 1980, which indicates Americans are taking shorter trips or just staying home.

Overall commuting patterns in recent years have idled. Workers value their cars because driving alone is perceived to be the fastest way to get to work. Public transit systems, in many cases resembling a hub-and-spoke model with the city in the center and transit lines extending into outer suburbs, don't always offer a convenient alternative to workers who commute suburb to suburb.

Carpooling rates hovered between 10.1 percent and 10.7 percent between 2001 and 2007, far below the nearly 20 percent of the early 1980s, when carpools of three to six people commuted together to cut costs. But as time and convenience grew in importance, those larger groups gave way to cars containing just a few occupants, according to commuting expert Alan Pisarski.

Public transportation has been steadily accelerating since 2004 to 4.9 percent in 2007, which was also the best year in 50 years for ridership, according to the American Public Transportation Association. Americans took 10.3 billion public transportation trips in 2007; the trade group estimates roughly 60 percent of public transit trips are work-related.

The run-up in gas prices in 2007 offered us a preview of the pain that was to come in 2008, when gas prices topped \$4 a gallon for roughly six weeks during which some reconsidered their monogamous relationship with their automobiles. We'll be anxiously awaiting the 2008 data to gauge whether that gasoline sticker shock will translate into significant behavioral changes. There are signs that Americans are still stinging from those fleetingly high gas prices — more than 2.8 billion trips were taken on public transit in the third quarter of 2008, a 6.5 increase over the year before and the largest quarterly increase in 25 years, even though pump prices declined rapidly during that same period.

Interest in public transportation has grown as employers search for ways to ease their workers' commutes. Some cities are concerned, borne of the need to ease congestion and pollution. San Francisco, for example, created a law requiring that employers offer workers transit benefits; other cities may follow.

About 40 percent of employers in metropolitan areas offer some sort of commuter benefit, including flex-time, pre-tax transit and parking programs or subsidized carpools, according to TransitCenter. Of companies reporting a participation rate of 75 percent or higher, more than a third offer the benefit as a subsidy or fringe, while 15 percent offer it on a pre-tax basis. Employees can deduct up to \$120 a month from their paychecks to buy transit passes — about half of the \$230 that drivers can deduct each month before taxes to offset the cost of parking, reflecting a car-centric transportation policy, says Larry Filler, TransitCenter's president and CEO, who is urging Congress to raise the cap.

President Obama has promised a revival in public transit, setting aside \$10 billion in funding for transit and rail as part of the economic stimulus package known as the American Recovery and Reinvestment Plan. The economy, of course, will affect all commute modes — not necessarily because workers will become greener, but because there will be fewer workers altogether.

Employer Commuting Strategies

Strategies to Address Rising Commuting Costs and Environmental Concerns	Currently Do	Plan to Do	Used to Do	Never Did
Flextime	51%	8%	2%	39%
Telecommuting program	37%	10%	2%	51%
Offer tax-free commuter benefits to encourage transit use	27%	10%	2%	61%
Facilitated ridesharing or vanpooling	10%	8%	2%	80%
Preferential parking for carpools or vanpools	10%	6%	2%	82%
Incentives for bicycling employees	7%	8%	1%	84%

Source: 2008 Commuter Impact Survey, TransitCenter Inc.

Overall commuting patterns in recent years have idled. Workers value their cars because driving alone is perceived to be the fastest way to get to work.

Employee Telecommuting

Inching Forward, Very Slowly



Millions of Americans are passing up their daily commutes in order to work in their home offices as telecommuters, but growth in telecommuting is gridlocked, unchanged from a year earlier — and back where it was six years ago, the rise (and fall) of gas prices notwithstanding, according to research firm IDC.

IDC defines “telecommuter” as someone who works from home at least three days a month as part of an arrangement with an outside employer. Others define it differently, focusing, for instance, on the greater pool of teleworkers, who spend at least one day a month working remotely.

IDC pegged the number of U.S. telecommuters at 8.6 million in 2008, a figure that has held steady since 2007. This idling number would surprise some given recent high gas prices, but there may be another reason behind the results, according to IDC researcher Merle Sandler: Telecommuting declines during times of economic downturn and job losses, as workers feel a more urgent need to put in appearances at the office in the name of job security.

IDC estimates that telecommuting in the U.S. is growing by just 2.2 percent annually, offset by the number of people who leave telecommuting every year.

About a third of those in IDC's latest survey have been telecommuters for less than two years.

About half of telecommuters work at home less than two weeks a month, while roughly a third work at home full-time — a figure that has been on the rise. By 2013, IDC predicts the number of telecommuters will rise to 9.6 million.

Three years ago, only about 40 percent of telecommuters received corporate support for their home offices — such things as employer-subsidized phone lines and furniture — compared to nearly two-thirds today. Technology, in large part, has enabled the acceptance of telecommuting due to expanded security measures, the increasing affordability of computers and greater availability of broadband and wireless access.

Employers offer telecommuting programs to boost work-life balance and reduce commuting costs, but they've found it often leads to happier, more productive workers, too. In a survey by the Computing Technology Industry Association, 67 percent said telecommuting boosted productivity because workers spend less time getting to and from work; a quarter of respondents reported higher employee retention.

Telecommuting can also save money for both workers and employers. A study of Sun Microsystem's employees who work half-time from home or in a flexible office found that individual workers save more than \$1,700 in gasoline and vehicle wear and tear, while home office equipment typically consumes about half the energy as standard office equipment.

Meanwhile, companies like PricewaterhouseCoopers, Lockheed Martin, Boeing, and AT&T have turned to telecommuting to trim their carbon footprints. Cisco, for example, tested its telecommuting technology on about 20 percent of its staff, a move that cut greenhouse gas emissions by about 30,000 tons a year and saved the company more than \$168,000 that would have been spent on carbon offsets. With results like those, and given companies' eagerness to cut costs, telecommuting could well find itself back in the fast lane.

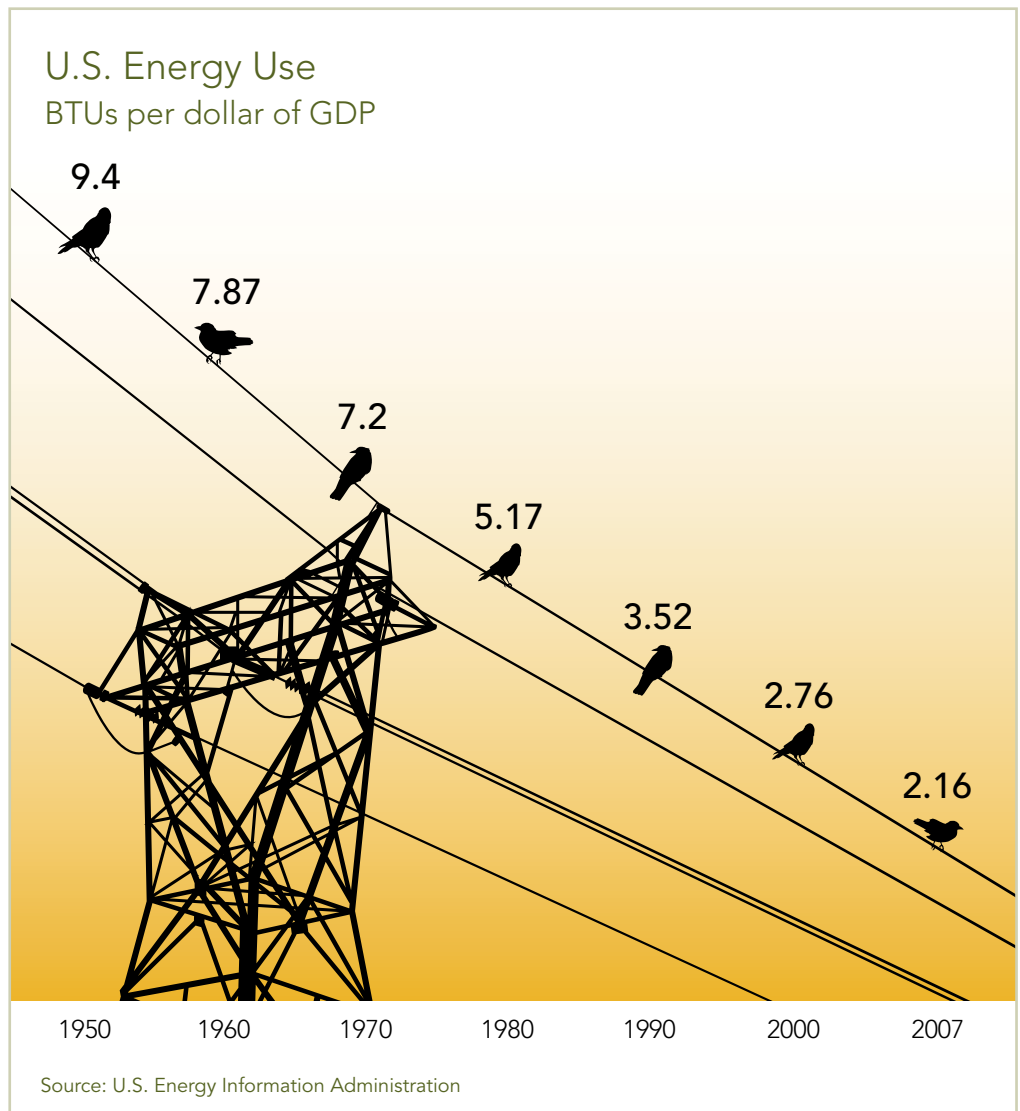
Firms With Highest Percent of "Regular" Telecommuters

Deloitte	90%
Cisco Systems	85%
Juniper Networks	75%
Accenture	67%
Recreational Equipment (REI)	53%
eBay	50%
S.C. Johnson & Son	39%
Southern Ohio Medical Center	37%
Booz Allen Hamilton	36%
American Fidelity Assurance	34%
Source: Fortune's "100 Best Companies to Work For"	

Growth in telecommuting is gridlocked, unchanged from a year earlier and back where it was six years ago, the rise (and fall) of gas prices notwithstanding, according to research firm IDC.

Energy Efficiency

A Success Story Continues, but Loses Power



In both good economies and bad, smart companies have been recognizing that they are sitting on a gold mine: By tapping into the lode of wasted energy in their offices, operations, and fleets, they can cut costs and emissions.

American industry has done more with less energy for decades. As machinery has become more automated and efficient, the amount of BTUs required — in the form of electricity and fuel — per dollar of gross domestic product has dropped more than 75 percent since 1950. (A BTU, or British Thermal Unit, is a standard unit of measurement used to describe the energy content of fuels.)

However, we're seeing a small but noticeable slowdown in the pace of efficiency improvements and as the economy continues to sour, that rate of decrease will likely flatten. While there remain significant gains that have so far been ignored or underexplored, companies have been hesitant to sink dollars into new projects, and banks are hesitant to lend funds to do so.

In the past year, as the price of a barrel of oil climbed over \$140 (something that had been a doomsday scenario not many years ago), energy efficiency became a top-of-mind concern. The speed with which companies and consumers took to heart energy-efficient technologies and strategies — fuel-efficient vehicles,

energy-saving light bulbs, and all the rest — offers an encouraging glimpse at what is possible for moving an entire society down the path of energy efficiency.

Technology is making much of this possible. Today's appliances, computers, electric motors, and light bulbs are significantly more energy-efficient than just a few years ago. Computers, switches, routers, and software — the nuts and bolts of computer systems and networks — are allowing homes and businesses to better take control of energy use, optimizing devices to run only when needed. As these devices help homes and businesses get increasingly "smarter," they'll engender a robust conversation between buildings, vehicles, and energy utilities, helping to drive down energy use and, potentially, costs.

The information-technology industry itself serves as a poster child of the challenges and opportunities ahead. A recent study reported that, because of the sheer growth of computing power and energy usage, two-thirds of corporate data centers will likely hit their limit for available electricity within two years. That's leading to a rich and diverse set of solutions that allow data centers not only to grow, but to do so with less power. In 2008, companies announced and even opened doors on cutting-edge data centers that can cut by anywhere from 15 to 50 percent of the amount of electricity used to power computers, servers, lighting, and heating and cooling for facilities.

The innovations that enable these kinds of power savings are finding homes outside of the IT world, many of which will boost the efficiency of other energy-intensive products and services.

Computers, switches, routers, and software — the nuts and bolts of computer systems and networks — are allowing homes and businesses to better take control of energy use, optimizing devices to run only when needed.

Most Energy-Intensive Industries BTUs used per dollar of product shipped to market

Cement	52.65
Bulk Chemicals	29.55
Iron & Steel	19.73
Refining	17.67
Paper	14.61
Aluminum	13.88
Mining	9.44
Glass	9.24
Wood	3.84
Agriculture	3.77

Source: U.S. Energy Information Administration

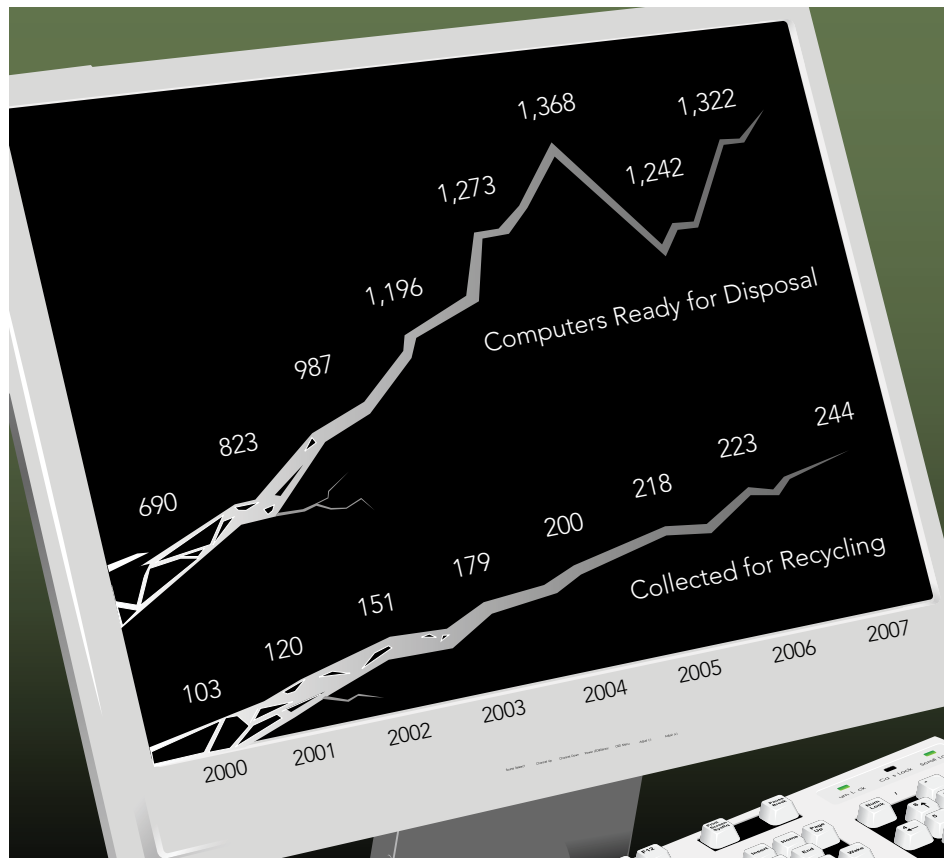
E-Waste

Recycling More, But Losing Ground



Computer Products Discarded and Recycled

Thousand tons per year



Source: U.S. Environmental Protection Agency

We continue to find ourselves buried under an ever-growing mountain of e-waste. Put another way, the progress we are making in recycling used electronics is inundated by the tsunami of electronics entering the waste stream.

But these numbers don't tell the full story. They come from the U.S. EPA's Office of Solid Waste and don't take into account the practices of the business community, which comprises as much as 40 percent of electronics sales, and which disposes of spent electronics through a network of "information technology asset disposal" services. Bigger firms use these services to recoup whatever costs they can — whether through refurbishing and reselling functional machines; breaking down equipment for scrap materials like metal, plastic and aluminum; or harvesting precious metals before they end up in the recycling bin.

There's much higher interest in getting the most out of these enterprise electronics, largely because much of what passes for "end of life" in the business world still has a significant amount of value remaining. So much of what companies discard or pass on to disposal companies doesn't go directly into the landfill — at least not right away. There's money to be made in recycling.

But that is about all the good news there is. Because of a near-total lack of regulatory oversight on e-waste, an unknown quantity of e-waste in the U.S.

gets sent overseas, where a combination of cheap labor and lax regulatory environments make it all the more profitable to recycle used electronics. One of the few glimmers of progress we saw last year came as journalists and activists published exposés showing the horrific conditions at e-waste processing facilities in Ghana and China. Recyclers emphasize that these polluting, poisonous plants are the exception rather than the rule. Either way, progress resulting from these exposés proves that sunlight is often the best disinfectant.

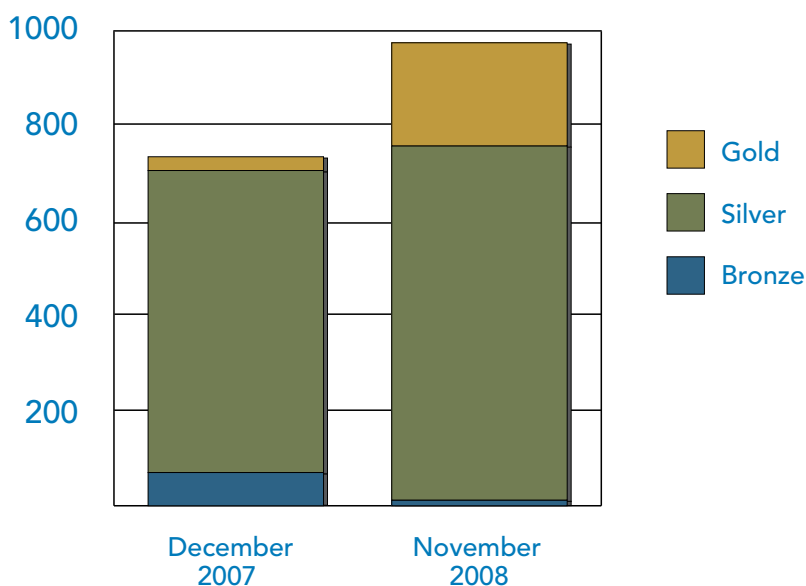
Speaking of sunlight, that light we're glimpsing at the end of this tunnel could come from one of two things: increased government regulation and improved design of electronics. Although responsible e-waste management is unlikely to top policymakers' lists any time soon, there is sufficient pressure from companies and activists to ensure that it will remain on their radar screens for a while.

As the chart below reveals, the number of products designed with the environment, human health, and recycling in mind is growing at a good clip. The best measure in the U.S. is the EPEAT certification, an IEEE standard that's managed by the Green Electronics Council. Launched in 2006, the number of EPEAT-certified products is rising fast, and even more telling is that in the past year manufacturers have engaged in a race to the top: Between December 2007 and November 2008, the number of EPEAT products achieving the entry-level Bronze certification dropped to nearly zero, while those earning the top-level Gold certification increased by a factor of nearly 10.

Products achieving the Gold level of EPEAT certification don't just eliminate a host of toxic chemicals, they are also designed for ease of disassembly. Easier disassembly means increased — and increasingly profitable — reuse and recycling of electronics, which in turn takes toxics out of harm's way. We expect that this means that someday, we'll be peeking out from under this pile of waste.

The progress in recycling used electronics is being inundated by the tsunami of electronics entering the waste stream.

Growth of EPEAT-Certified Products



Source: Green Electronics Council

Financial Impacts

A Slow Decline in the Price of Polluting



Financial Impact Ratio

Cost of environmental damage as a percentage of economic output



Source: Trucost Plc

Companies face growing legal and reputational pressure to address their overall impact to the natural environment. Policies to implement the “polluter pays” principle will likely create increasing pollution-related costs from operations and supply chains. In response, more companies are starting to measure and minimize their environmental impact. How are they doing?

One measure of the financial cost of corporate environmental impacts has been developed by environmental research firm Trucost. It measures more than 700 specific environmental impacts, including greenhouse gas emissions, water use and waste. To take stock of different impacts, environmental damage costs are applied to quantities of emissions. For example, each metric ton of carbon dioxide emitted is priced at \$35. Environmental damage costs for each impact are summed and the total is normalized per unit of economic output to calculate each company’s environmental Impact Ratio. For example, if a company’s total sales are \$100 million and the environmental damage costs are \$10 million, the Impact Ratio would be 10 percent. These aren’t costs the companies typically pay — at least not yet. But that could change.

Environmental policies under the Obama administration could dramatically affect corporate Impact Ratios, as damage costs are internalized onto balance sheets. For example, a planned cap-and-trade scheme to regulate greenhouse gases will create a price for carbon dioxide emissions. Impact Ratios can be used to identify a company’s exposure to pollution costs.

“Impact Ratios are useful to compare the environmental intensity of large and small corporations in different sectors, as well as changes in performance over time,” explains James Salo, Trucost’s vice president of strategy and research. For example, environmental damage costs for Pepco Holdings, an energy utility, amounted to 4 percent of its output in 2007. In 2005, Pepco’s Impact Ratio was

6 percent, meaning its environmental intensity has fallen by more than a third over three years.

To determine whether such improvements in environmental performance are reflected across the wider economy, Trucost measured the environmental Impact Ratios of companies listed in the Russell 1000 Index (which includes the 1,000 largest publicly traded U.S. companies) over three years. Their combined Impact Ratios show that between 2005 and 2007, overall environmental intensity decreased 11 percent. This suggests improvements in environmental efficiency are widespread. But the rate of decline slowed between 2006 and 2007.

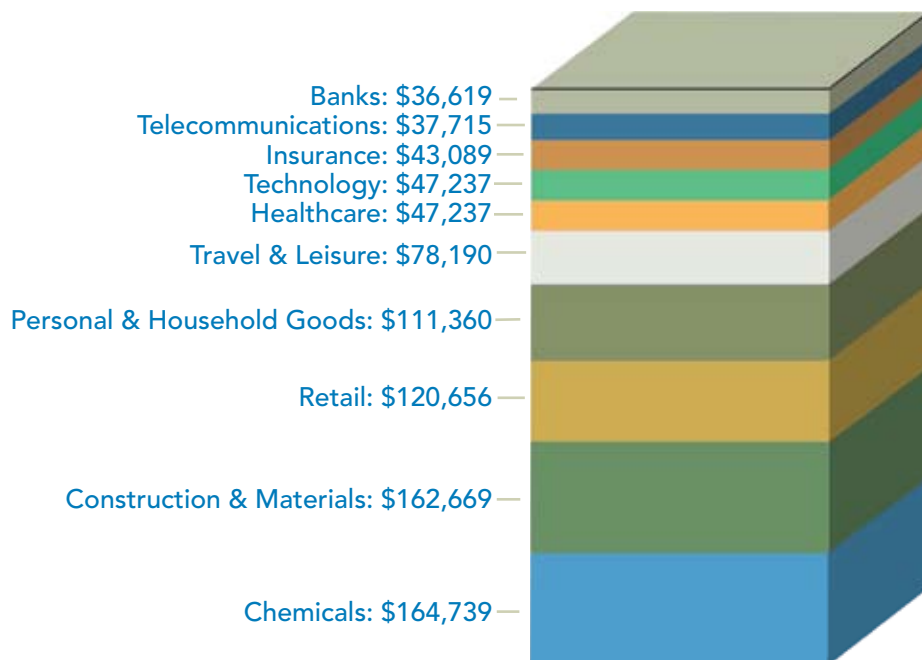
Different sectors vary widely in their impacts. Damage costs in the utilities sector are driven by greenhouse gas emissions from burning fossil fuels, including natural gas and coal, to generate electricity. In the food and beverage industry, water use is one of the main environmental impacts.

Companies within the same industry also can differ significantly. For example, in the utility sector, Allegheny Energy had an environmental Impact Ratio of 87.64 percent (that is, more than \$876,000 of environmental cost for every million dollars of generated), compared with FPL Group's environmental Impact Ratio of 23.58 percent (\$235,800 of environmental cost per million dollars). The difference is explained by Allegheny's reliance on coal for electricity generation, whereas FPL Group uses mostly natural gas.

As environmental costs strengthen their bite over the coming years, more-efficient companies will be better positioned. As Trucost found, some companies have already started down this path.

Between 2005 and 2007, overall environmental intensity dropped 11 percent. This suggests improvements in environmental efficiency are widespread.

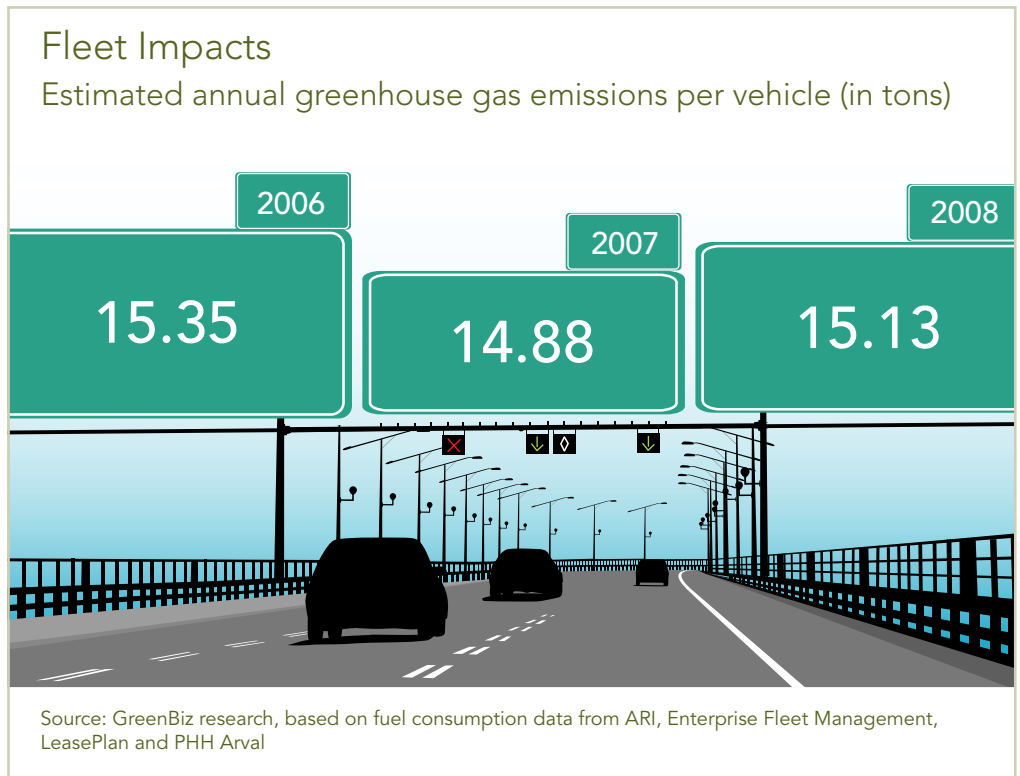
Industry Contributions to Environmental Intensity (billions of dollars)



Source: Trucost Plc

Fleet Impacts

Stop-and-Go Sales Put a Drag on Progress



The nation's corporate fleets drive about twice the rate of personal vehicles, representing a major opportunity for fuel efficiency efforts. Fluctuating gas prices, coupled with corporate sustainability commitments, have cast a spotlight on green fleet initiatives that can save money and boost reputations.

But making corporate fleets more fuel-efficient can be a multi-year process with many moving parts: cost considerations, alternative fuel infrastructure limitations, resale potential, and driver behavior, to name a few. Each fleet is different, and even within the same fleet vehicle functions vary, so there is no one-size-fits-all formula.

To gauge how the nation's corporate fleets are embracing green fleet efforts, we evaluated fuel consumption data from some of the country's largest fleet management companies over the past few years. We found that greenhouse gas emissions per vehicle declined by 3 percent in 2007 over the year before, but ticked up slightly in 2008, which was a bit surprising considering the high fuel prices during much of the year. But there are a several likely explanations for the increase: Downsizing could have forced the remaining vehicles (and their drivers) to work even harder, while high gas prices may have increased employees' personal use of company vehicles.

Interest in green fleet initiatives is growing, according to a PHH Arval survey of fleet managers, which found nearly 80 percent of respondents saying concern over the eco-impacts of their fleets is growing at their organizations.

Fleet management companies have stepped in the fill the demand with services such as GreenPlan by LeasePlan, Keys to Green by Enterprise Fleet Management, GreenFleet by PHH Arval, and EnviroFleet by ARI. Most services include fleet greenhouse gas measurement, identification of options for right-

sizing vehicles, driver education, and the option to purchase carbon offsets.

These types of low-hanging fruit are abundant. In fact, PHH Arval's GreenFleet program helped reduce its clients' emissions by an average of 14 percent while shaving operation costs by 4 percent on average in 2007; some clients improved fuel economy by more than 20 percent.

Still, cost is viewed as a major obstacle to reducing fleet impacts. Newer technologies in passenger vehicles, such as gasoline-electric hybrids, can carry a purchase price premium that may be difficult to recoup in the projected lifetime of some vehicles — if commercial fleets can even get their hands on the high-demand cars. For some larger vehicles, such as cargo vans, hybrid technology is limited or nonexistent. Pushback from drivers and attractive manufacturer incentives for less-efficient vehicles can also slow the transition from larger trucks to greener fleets.

Though gas prices have fallen since the highs of 2008, most experts don't expect them to remain low and many firms are positioning themselves for better fuel economy. Based on an analysis of recent orders for 2009 model-year vehicles at PHH Arval, there's a huge spike in purchases of four-cylinder vehicles over six-cylinders, and a drop in the number of SUVs. Abbott Labs, which allows staff to choose their vehicles, reported a 183 percent increase in hybrid orders and 35 percent drop in SUV/minivans, thanks to a company policy forcing drivers of less-efficient vehicles to pay more for personal mileage than those driving sedans. Several said interest in vehicle telematics is picking up speed.

Despite the slumping economy, many organizations have moved forward with alternative fuel vehicles, though the lack of infrastructure means deployment is limited to certain geographic areas, such as ethanol in the Midwest or compressed natural gas (CNG) in California. For example, United Parcel Service and AT&T added hundreds of hybrids and CNG vehicles to their fleets in 2008, with plans for more AFVs. Meanwhile, the U.S. Postal Service is adding plug-in electric vehicles to its mix later this summer while exploring the feasibility of retrofitting existing vehicles with electric powertrains.

10 Large U.S. Alternative Fuel Fleets

Enterprise	7,000
Schwan's	5,800
U.S. Postal Service	4,448
Waste Management	2,305
Pacific Gas & Electric	2,102
Johnson & Johnson	2,091
Commonwealth Edison	1,917
Consolidated Edison	1,752
Ferrellgas	1,600-2,100
Florida Power and Light	1,285
Excludes flex-fuel vehicles.	
Source: GreenBiz research with assistance from Automotive Fleet	

Pushback from drivers and attractive manufacturer incentives for less-efficient vehicles can slow the transition from larger trucks to greener fleets.

Green Jobs

**Strong Growth
May Be a
Matter of Policy**



Green Job Growth

Existing jobs in the renewable energy and energy efficiency industries (in millions)



At a time when U.S. companies are shedding jobs at an alarming and escalating rate, politicians, environmentalists, and others offer the promise of so-called green jobs as a critical boost for our tattered economy. Numerous academic, investment, and labor organizations have churned out study after study predicting a surge in green jobs just around the bend, assuming the right blend of government policies, investments, and market conditions.

Those employed in traditionally environmental activities, such as recycling plants or wind turbine factories, comprise only a small percentage of those jobs that can be deemed "green." Most are traditional jobs, such as computer analysts, truck drivers, or accountants, occupied by people who may not self-identify with the green sector, according to research from Management Information Services Inc. (MISI) and the American Solar Energy Society (ASES). The two groups estimated that the renewable energy and energy efficiency industries employed about 9.1 million Americans in 2007, up from 8.5 million in 2006, for a net increase of 600,000 jobs.

Most jobs in the renewable energy and energy efficiency industries are found in the private sector, with ethanol and biomass power representing large employment opportunities in renewable energy. The lion's share of the jobs analyzed in the MISI-ASES reports, however, are created through the drive for energy efficiency, with the bulk originating in recycling, reuse and remanufacturing, nondurable manufacturing, and construction.

The authors estimate the two sectors could employ as many as 37 million in 2030 under an aggressive policy scenario that requires sustained government commitment. While it's unlikely that fully a fifth of the U.S. workforce would be working in renewable energy, we like the bold thinking.

But the jobs reported or estimated by MISI and ASES represent only a portion of American green jobs, since their analyses examine only those working in renewable energy and energy efficiency jobs. Those working in water treatment, pollution prevention, or remediation, for example, aren't included in the MISI-ASES report.

Another report, published in 2008 by Raquel Rivera Pinderhughes, professor of urban studies at San Francisco State University, looked at the green-job scene more broadly. Pinderhughes listed 22 types of "green-collar" jobs, from food production (organic or sustainably harvested products) to furniture making (from certified sustainable and recycled wood), from parks and open space (maintenance and expansion) to printing (using non-toxic inks and dyes and recycled papers). It's a good list, but even Pinderhughes doesn't cover all that's out there.

Whatever the definition, the well of green jobs may not end up quite as full as analysts hope if the U.S. doesn't quickly ramp up green job-stimulating policies. A year ago, MISI-ASES predicted there could be 40 million renewable energy and energy efficiency jobs in the U.S. by 2030 under an aggressive scenario, but they revised their projections downward in their latest report because of government inaction. Since it can take years to implement and bring aggressive policies to scale, the largest job gains are enjoyed in the later years of the forecast; the loss in job gains could be difficult to recoup.

Most green jobs are traditional jobs, such as computer analysts, truck drivers, or accountants, occupied by people who may not self-identify with the green sector.

Top Jobs Generated by Renewable Energy in 2007

- Truck Drivers
- Bookkeeping and Accounting Clerks
- Electricians
- Plumbers, Pipefitters and Steamfitters
- Agricultural Equipment Operators
- Sales Representatives
- Janitors and Cleaners
- Business Operation Specialists
- Computer Software Engineers
- Civil Engineers

Includes direct and indirect jobs. U.S. only.

Source: Management Information Services Inc.

Green Office Space

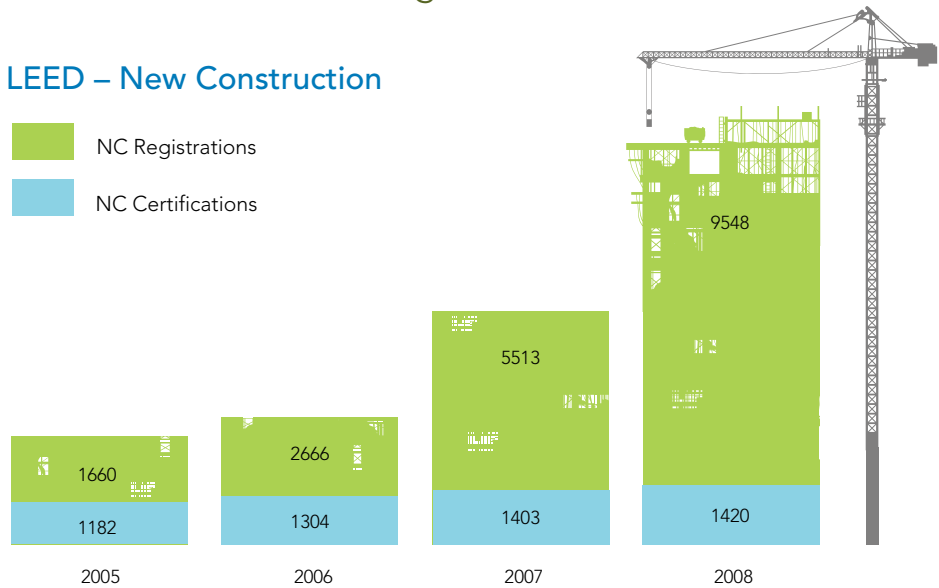
No Longer Rising to the Occasion



Growth of Green Buildings

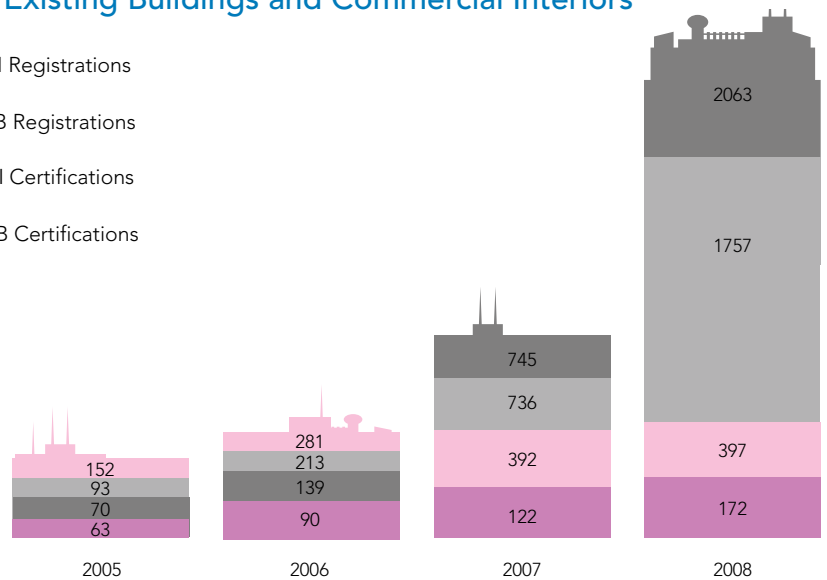
LEED – New Construction

- NC Registrations
- NC Certifications



LEED – Existing Buildings and Commercial Interiors

- CI Registrations
- EB Registrations
- CI Certifications
- EB Certifications



Source: U.S. Green Building Council

There is no denying that green buildings are booming, but we're just not sure how fast. A gap has long existed between the number of projects registered to eventually become certified under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program and those projects that actually earn the certification, but in recent years the gap has grown into a yawning chasm.

For the last several years, the growth in certified projects in the three LEED categories we examined — LEED for New Construction, LEED for Existing Buildings, and LEED for Commercial Interiors — has been cruising along at a respectable annual growth rate of anywhere from 10 to 90 percent. Last year, however, certifications in two of those categories slowed to an almost complete stop. Although certifications for LEED-EB facilities increased by a healthy 40 percent in the past year, LEED-NC and LEED-CI certifications grew by 1.2 and 1.3 percent, respectively.

Part of this is due to the long lead time in the construction or renovation of commercial facilities: The drop-off this year is due as much to the economic slowdown as it is to what can be seen as the end of the first wave of LEED certifications and the beginning of the second. Robert Watson, executive editor of GreenerBuildings.com and one of the founders of LEED, says that thanks to a handful of changes in the structure and administration of the LEED system, we'll see growth continue in the coming years.

The number of registered projects in each category certainly bears out that hypothesis; each registration category experienced growth of anywhere from 100 to 300 percent. Even if a fraction of them never seek certification, it promises to be a booming market for green buildings.

And a boost for the environment. In a groundbreaking report from late last year, Watson and his team published the *Green Building Impact Report 2008*, the first-ever study of the effects of LEED-certified buildings to date, and projections for the environmental impact these facilities will have in the coming decades. To wit: By 2008, certified LEED buildings certified to date have saved around .3 quadrillion BTUs of energy; but by 2020, that number will climb to nearly 1 quadrillion BTUs, or the equivalent of avoiding burning more than 48 million tons of coal.

But the question of the pace of growth for LEED buildings looms large. In 2006, the USGBC set a goal of certifying 100,000 commercial buildings and 1 million homes by 2010. Given that total certifications in these three categories were still under 2,000 at the end of 2008, those achievements seem unlikely.

To accelerate growth, the USGBC has been working on major expansions of the types and scope of buildings eligible for certification. LEED for Schools and LEED for Retail are both underway, offering a certification platform tailored to the specific needs of those types of facilities; and the LEED Portfolio program will allow builders that are constructing many of the same types of facilities — whether homes or supermarkets — to streamline the certification process.

Will we see a five-hundredfold growth in LEED certifications in 2009? Probably not, given the sad state of the real estate market, but we expect growth to continue steadily nonetheless.

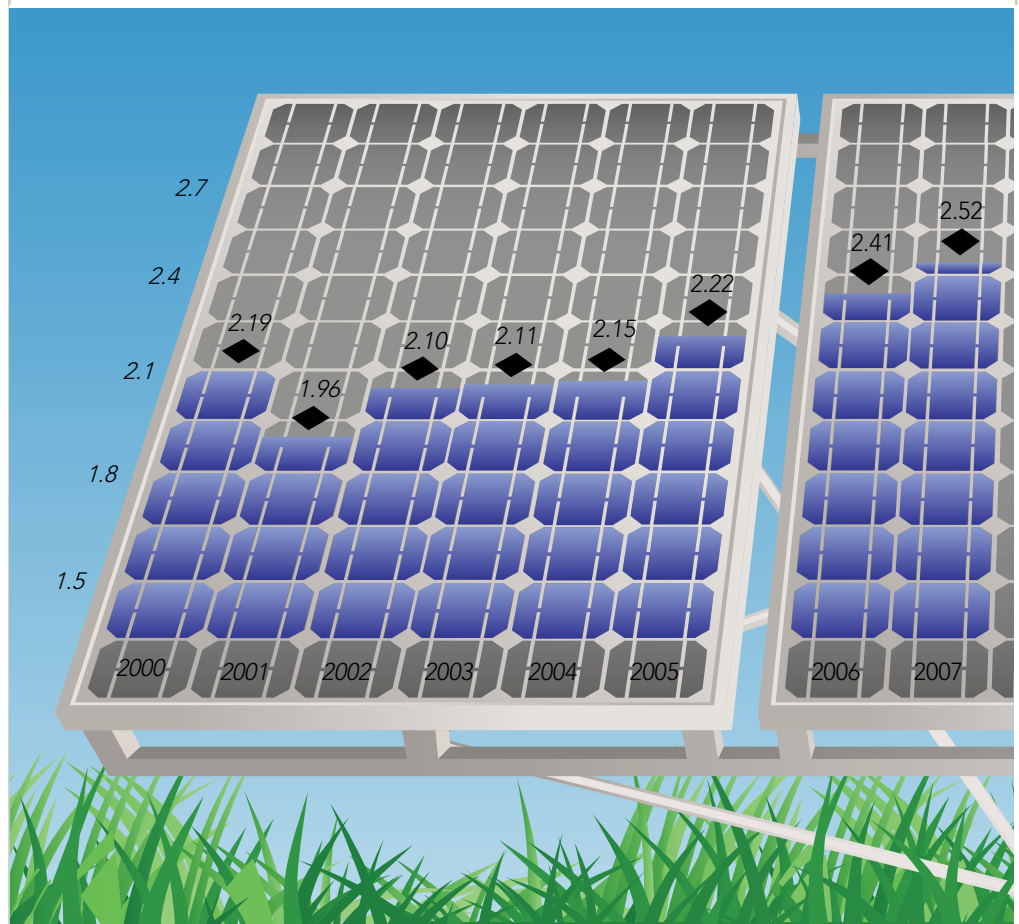
The USGBC set a goal of certifying 100,000 commercial buildings by 2010. Given that total certifications were under 2,000 at the end of 2008, that seems unlikely.

Green Power Use

Slow Growth Rate Could Use Some Juice



Renewable Energy Use Percentage of all U.S. electricity generation



Source: U.S. Energy Information Administration

Generation of non-hydro renewable energy — including solar, wind, and biomass — grew nearly 7 percent in 2007 from the year before, outpacing the 2.3 percent annual growth in all electricity generation during the same period. A large part of this is due to 21 percent growth in wind-generated electricity, as well as moderate increases in biomass waste-based electricity.

As a whole, non-hydro green power still accounts for only a small slice of all electricity generation, with fossil fuels such as coal and natural gas accounting for the bulk. And that slice isn't growing much: In 2007, non-hydro renewable energy was 2.5 percent of all generation, compared to 2.4 percent in 2006.

In aggregate, the progress appears slow because of the relative small size of the renewable energy sector, compared to the existing power generation industry; even modest growth from a small base doesn't amount to much. But a closer look at the sub-sectors reveals impressive strides in boosting capacity.

The U.S. wind industry, for instance, had a banner year in 2007, with installed capacity growing 45 percent; installations in the final quarter of 2007 surpassed the total amount installed in 2006. The wind power fleet spans more than 30 states, led by Texas, California, Minnesota, Iowa, and Washington. According

to the American Wind Energy Association, at least 14 manufacturing facilities opened or were announced in 2007.

The results in 2007 were bright for solar, too, with photovoltaic (PV) installations growing 45 percent, while PV manufacturing in the U.S. soared 74 percent. The country saw its first concentrating solar power plant built in 15 years, with announced contracts of more than 4,000 megawatts in the pipeline.

Complete data from 2008 aren't out yet, but early early returns look promising: In 2008, the U.S. surpassed Germany in wind generation, exceeding 21,000 megawatts, a significant share of the growth of all new electricity capacity. The number of solar PV installations nearly doubled in 2008. Geothermal projects under development in 2008 will more than double existing capacity.

Other bright spots but their structure needs improvement: The federal renewable energy production tax credits were extended in late 2008. And more than two dozen state-level renewable energy portfolios — which mandate that the states receive a minimum percentage of their power from renewables — will foster growth in green power in the coming years. Green power lobbyists are pushing for a federal standard requiring that 10 percent of the nation's energy come from renewable sources by 2012. Meanwhile, President Obama has signaled his desire to see renewable energy generation double in three years: His economic stimulus package proposes nearly \$20 billion in tax incentives for wind and solar, with a congressional committee allocating nearly \$54 billion for direct spending on energy tech programs, such as improving the country's electricity grid in order to support renewable energy transmission and the anticipated growth of electric cars

The U.S., the world's top non-hydro green power generator, saw its renewable energy sector grow at a 5 percent compound annual rate between 2000 and 2007, according to data from the International Energy Agency. But others are doing better: During the same period, the No. 2 and No. 3 generators, Germany and Spain, each enjoyed a growth rate of nearly 26 percent.

Estimated Green Power Growth of Top 10 Generators 2000-2007

	2007 Gigawatt-Hours	Compound Annual Growth
United States	108,462	5.02%
Germany	69,114	25.95%
Spain	31,105	25.80%
Japan	22,577	4.84%
United Kingdom	15,873	18.34%
Italy	15,188	12.95%
Canada	12,295	5.60%
Finland	10,739	3.20%
Denmark	10,450	8.72%
Mexico	10,116	6.83%

Based on International Energy Agency estimates. Includes only member countries of the Organization of Economic Co-operation and Development

More than two dozen state-level renewable energy portfolios — which mandate that the states receive a minimum percentage of their power from renewables — will foster growth in green power in the coming years.

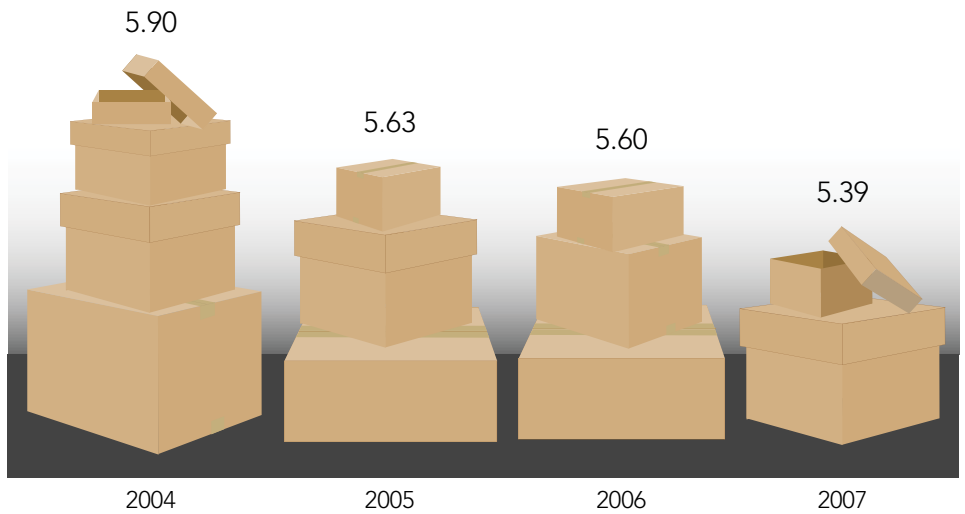
Packaging Intensity

Gains from Thinking Outside the Box



Packaging Use

Thousand of tons per billion dollars of GDP



Source: GreenBiz.com research. © 2009 Greener World Media, Inc.

It looks more and more like what you see is what you get, at least when it comes to packaging. Leadership companies are increasingly thinking outside of the box — or bag, or can, or bottle — when it comes to developing new ways to ship, protect, and sell goods while generating less waste. After a year of little improvement, the overall intensity of our packaging needs, as measured in thousands of tons of paper, plastic, and aluminum per billion dollars of gross domestic product, took another promising dip in 2007.

Once again, Wal-Mart is one of the leading figures behind this improvement. In 2008, the company's much-anticipated Packaging Scorecard went into effect, allowing the mega-retailer and its suppliers to know just how much progress is being made on using both greener materials and fewer materials overall. There are benefits to manufacturers, shippers, shoppers, and the planet alike, from saving on resources on the front end, to shipping more goods in the same truck, to reducing reshelving costs, to taking up less space in recycling bins or landfills. Cutting down on containers pays a nice bundle of dividends across the board.

In most of our categories, packaging use is down: Paper use, which we recalculated for this year's report to better represent the total amount of paper used in the United States, dropped in 2007 after significant growth in 2006; the total used in 2007 is the lowest we've seen yet. Aluminum use saw a steeper decline from last year as well; only the use of plastics increased between 2006 and 2007, although according to a report from the American Chemistry Council, the amount of plastics recovered and recycled year over year is steadily increasing, and in 2006 was up 5.6 percent over 2005 rates.

There is no shortage of reasons for the overall decline in packaging intensity.

In addition to Wal-Mart's significant influence, we saw several examples of companies that cut down on their packaging to save resources and cut costs. Winemaker Fetzer Vineyards, for instance, announced that it would cut the amount of glass used in its wine bottles by 16 percent by trimming the punt — the indentation at the bottom of the bottle — and making the bottles slightly thinner. PepsiCo and Coca-Cola both redesigned their plastic beverage bottles to maximize volume and minimize material use; Coke also uncapped a major new bottle-to-bottle recycling facility that can produce 20 billion 20-ounce plastic bottles per year from recycled plastic.

From small but significant changes to complete overhauls, two notable examples hit our radar last year: The tech company Hewlett Packard offered for sale (at Wal-Mart, naturally) a laptop that uses 97 percent less packaging than traditional computers. By ditching the box and selling the machine in a laptop bag made of nearly 100 percent recycled materials, the company not only saves big on materials, but it is able to ship more products on the same pallet.

Breaking the mold, Church & Dwight, the maker of Arm & Hammer cleaners, last year began selling empty bottles of several of its cleaners. As surprising as it sounds, the move will benefit shoppers as well as retailers and Arm & Hammer itself. Instead of shipping full bottles of cleaning products that largely consist of water, the company is instead selling a bundle consisting of an empty (and reusable) 32-oz. spray bottle and a smaller concentrated bottle of cleaner. You empty the concentrate into the spray bottle, fill with water, shake, and voilà — the same bottle of cleaner you might otherwise have purchased. Customers can buy refills of the cleaner and use the spray bottle over and over.

Such innovations have an added benefit: In a time when customers have begun slamming environmentally egregious packaging on the Internet and rapping companies for waste, green-packaging strategies bring favorable notice to a company or product line. Amazon.com recognized this when it launched a program in 2008 called Frustration-Free Packaging, aimed at shipping products smartly and efficiently.

From the demand side and the supply side alike, streamlining packaging has quickly become an easy, effective and popular trend in manufacturing, and we expect to see more companies take the wraps off their goods in new and innovative ways.

Wal-Mart says its packaging goals will reduce CO₂ 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.

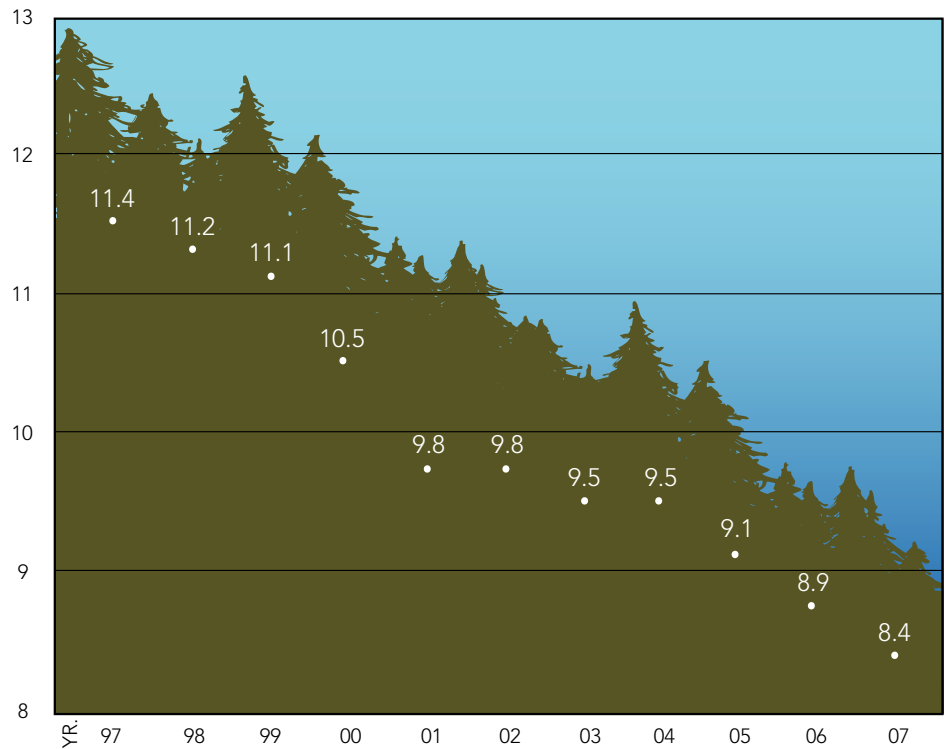
Paper Use and Recycling

Lots of Good News, At Least on Paper



Paper Intensity

Thousands of tons of paper per billion dollars of GDP



Source: American Forest & Paper Association

There's good news, and more good news: Each year, we are using less paper — and recovering more of what we use.

There are two sides to this page: technologies that have increasingly freed the business world from the need for paper, and the steady growth of recycling programs. Moreover, it seems that we, as individuals, have become increasingly accustomed to recycling both at home and at work.

The data we found this year suggest that we're picking up steam in reducing our paper intensity: The amount of paper used per billion dollars of gross domestic product decreased by the largest amount since 2000, while the amount of total paper recovered climbed faster than it has in the last 10 years. In 2007, we used 8,400 tons of paper in the course of generating a billion dollars of GDP, compared to 11,400 tons a decade ago, roughly a 27 percent drop. Meanwhile, recycling rates for paper have grown from 44 percent to 56 percent, an increase that's also about 27 percent.

What these data don't show, at least not yet, is the effects of the global recession on paper intensity. As we found last year, a large part of the boom in recovery was due to the growth in demand for paper pulp in developing countries, especially China. With demand high, recycled pulp commanded a high price, making recycling profitable. But as demand dropped, recycling

became less of a cost-justifying proposition. At the end of 2008, the situation deteriorated to the point that even progressive cities like Madison, Wis., were forced to pay recyclers to take away used paper, rather than being paid for the waste by recyclers.

Consensus is that there is little chance that paper recycling practices will stop in offices and homes — it's become part of who we are — so the used paper will continue to pile up. For now, it's cheaper for processors to take all that paper you're putting in the blue bins at home and work and just sit on it, hoping prices rise soon. But a drawn-out downturn can make storage costs prohibitive.

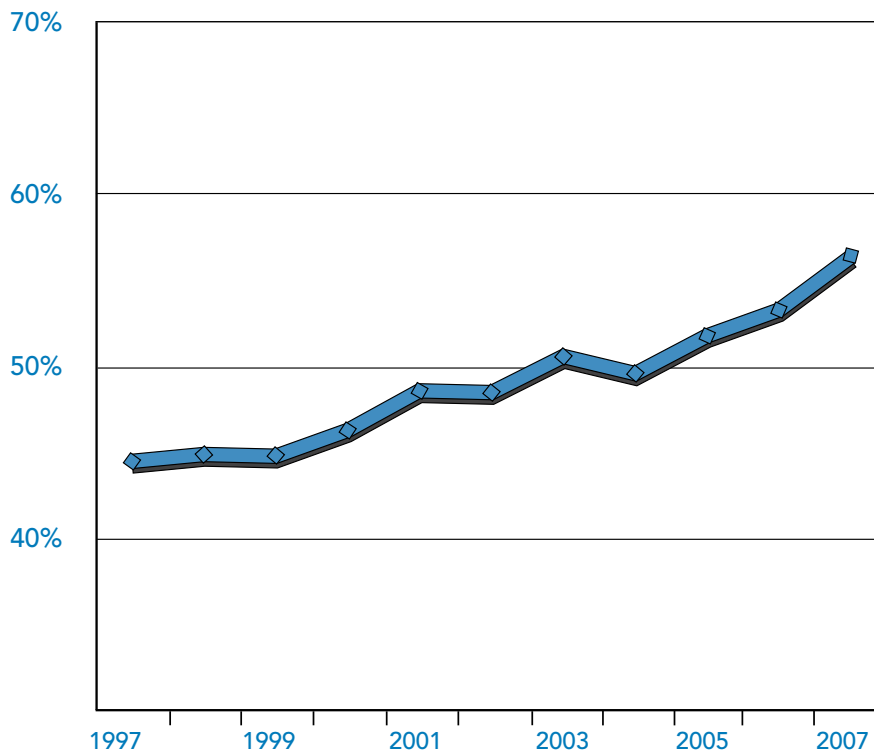
Meanwhile, the other side of the page: Our overall use of paper is steadily dropping. Attributing the steady decline in paper use per unit of GDP to a high-minded eco-consciousness is no doubt somewhat fallacious; it certainly doesn't hurt the cause of paper conservation that it's so much easier to do many of our most paper-intensive work entirely in bytes, bits, and pixels.

The drop in paper use could be a counterbalance in the supply-demand equation: Less demand for paper products could result in less being recycled, which could help stabilize prices. What goes around, comes around.

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.

Paper Recovery Rate

Percent recovered of total paper supply, 1997-2007



Source: American Forest & Paper Association

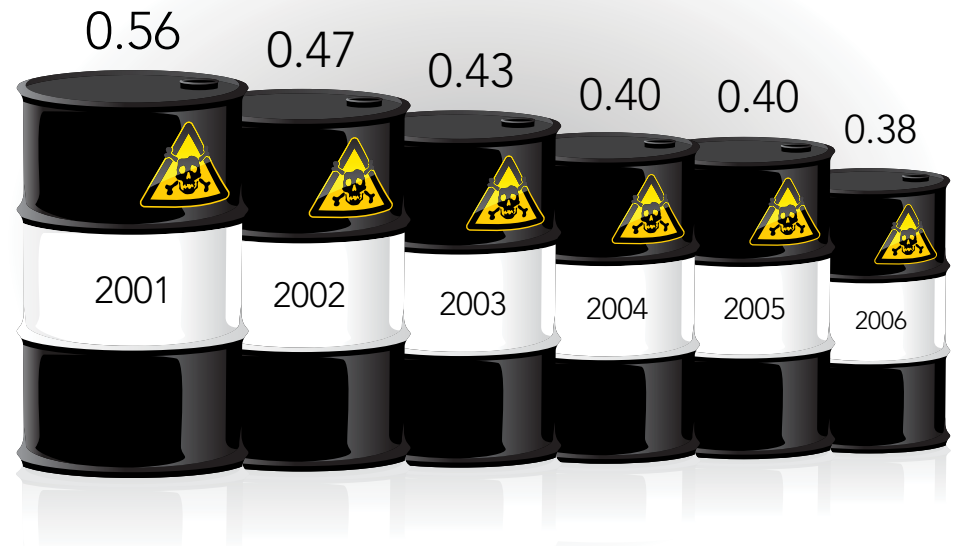
Toxic Emissions

Hum-Drum
Reductions
in Releases



Toxic Intensity

Pounds of emissions per thousand dollars of GDP



Source: U.S. Environmental Protection Agency

By many measures, the U.S. EPA's Toxic Release Inventory has been a success story since its inception in 1988. It is the premier pollution reporting and citizens' right-to-know program and measures chemical use efficiency and waste and pollution reduction in factories and facilities across the country.

Between 1988 and 2006, the most recent year for which data are available, disposal and releases of the chemicals under the original TRI program decreased by 1.77 billion pounds, or 59 percent. In 2006, the 22,880 U.S. facilities required to report TRI emissions released 4.25 billion pounds of chemicals into the air, land, and water, roughly 2 percent less than in 2005. Emissions also declined slightly when calculated as a percentage of gross domestic product.

The mining sector, with 1.22 billion pounds of toxic chemical disposal or releases, represented the largest slice of the TRI pie in 2006, and was responsible for the largest increase from 2005, at 47 million additional pounds. The electric utility sector had the second largest disposals or releases in 2006, 1.02 billion pounds, a 6 percent decline from the year before.

Changes in reporting made by the Bush administration will likely skew the numbers lower in coming years. In 2006, the EPA implemented new rules that increased the threshold at which facilities must submit detailed reporting for certain chemicals. Previously, facilities had to report detailed information when releasing or managing more than 500 pounds of non-persistent bioaccumulative toxic (non-PBT) chemicals as waste. The new rules raised the threshold to 5,000 pounds, as long as direct environmental releases are less than 2,000 pounds.

Moreover, facilities previously had to provide detailed information for any

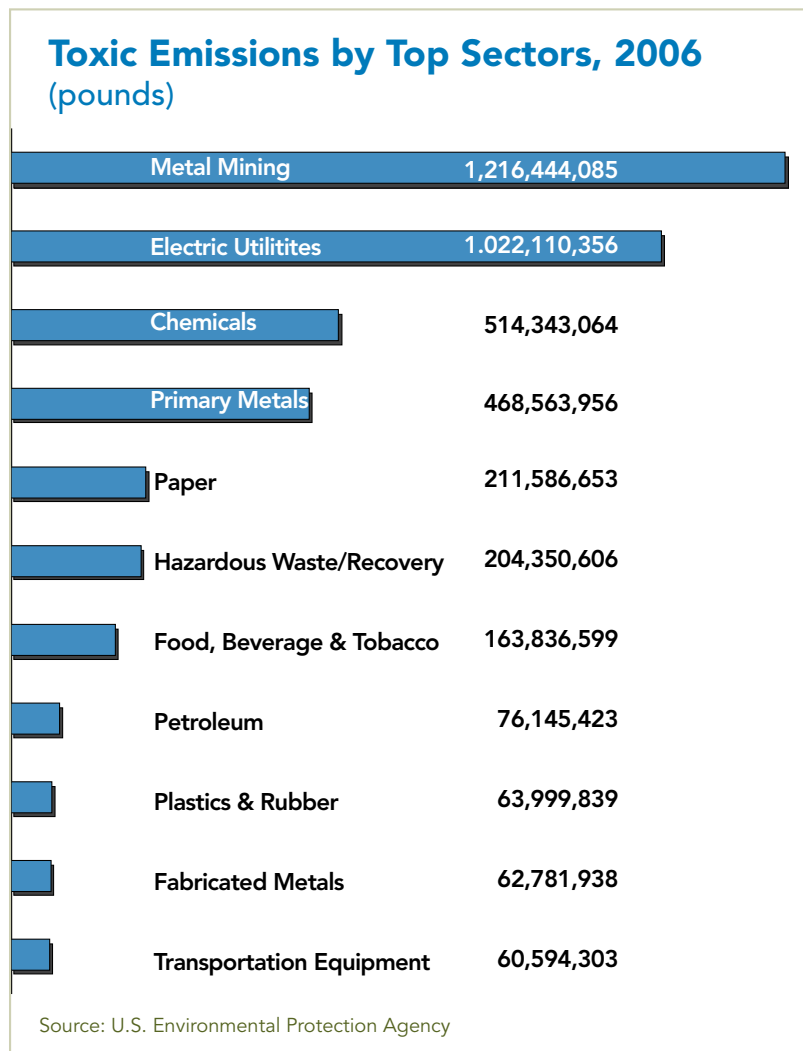
reportable levels of PBT chemicals. Less detailed reporting is now allowed if a facility handles less than 500 pounds as waste, as long as there are no PBT emissions. The new rules went into effect for the second half of 2006 TRI data.

The result of all these changes: Fewer facilities will have to report their emissions to the government, and many others will report them in a less-specific way.

The EPA went forward with the new rules to ease the burden on reporting facilities despite overwhelming opposition from the public, including 12 attorneys general, who filed a lawsuit to reverse the rules in an action that is still unresolved. The EPA estimates the new rules will impact less than 1 percent of all toxic waste tracked by the TRI, but a report from the U.S. Government Accountability Office found this national estimate obscured a “disproportionately” large impact on individual communities. The GAO also estimated as many as 3,500 facilities may no longer be required to report toxic emissions, which means more than 22,000 of the nearly 90,000 TRI reports might no longer be available to communities, diminishing the usefulness of the TRI.

As always, the push and pull of government regulation continues, leaving the future of TRI reporting up in the air: California passed a law requiring facilities in the state to adhere to the previous reporting requirements, and environmental groups are hoping Congress and President Obama will reverse the rules.

Changes in reporting requirements made by the Bush administration will lead to fewer facilities reporting their toxic emissions.



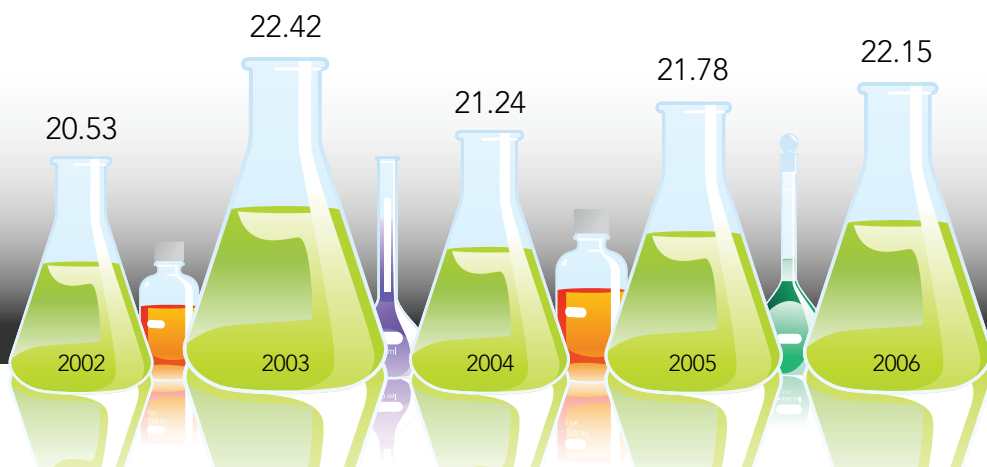
Toxics in Manufacturing

A Murky Picture, but Some Success



Toxics in Manufacturing

Tons of selected toxic chemicals used per billion dollars of GDP



Source: U.S. Environmental Protection Agency

Trying to gauge the progress being made in reducing toxic chemical use is as close to a hopeless task as we encountered this year. While there is plenty of anecdotal information suggesting industries of all types are making products using ingredients less harmful to the health of people and the planet, the data are too far-flung to capture simply but still meaningfully.

Consider that there are some 85,000 synthetic chemicals approved for commercial use in the U.S., and in one industry alone — cosmetics and personal care — there are an estimated 12,000 chemicals in use. So any attempt to gather a reasonable list of chemicals to track is challenging at best. Couple that with long lead times and slow progress on regulations and reporting at the federal level, and a snapshot of harmful chemicals in use is a tall order.

But just because a topic is difficult to study doesn't mean it's not important, and the hidden hazards in everyday products are spending increasing time in the spotlight. Last year alone saw notable public scares for items ranging from lead in candy to melamine in milk products to bisphenol A in plastic bottles and other common products and toys.

Barring a complete chemical set to look at, and limited data-gathering tools publicly available, we settled on the EPA's list of 20 persistent, bioaccumulative and toxic chemicals, or PBTs. These chemicals fall in a range of categories — including pesticides, plastic softeners, and byproducts of manufacturing — known to be highly toxic and long-lasting, and can build up in the environment and in our bodies over time, leading to enduring health and pollution issues.

Launched in 1998, the government's PBT program began by monitoring 12 chemicals, including several categories of compounds of lead, mercury, and dioxins. The program is working with industry partners to reduce or eliminate the use of these chemicals, and has been seeking out new harmful chemicals to add to the list, which now totals 20 chemicals or compounds.

As the data show, the news isn't entirely good. Although there is no upward trending in the use of these chemicals, there clearly isn't any wholesale reduction in their use, either. And a look at the PBT program's progress reports further echoes the bad news: The most recent report online is dated 2001-2002.

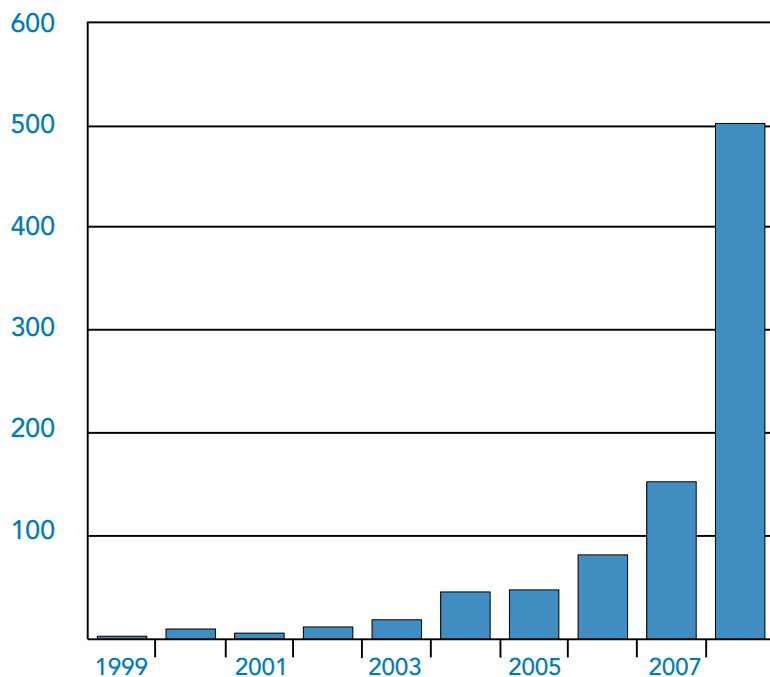
That's not to say there's no progress; it's just that leadership is coming from the private sector and activists rather than the federal government. Industry groups, sector leaders and nonprofits are tackling the use of toxics from all corners, with some notable successes. Among the many examples we've seen recently are the adoption of new green design standards in computer hardware and the reformulation of everything from cleaning products to printer inks.

We're also seeing the growth of partnerships aimed at tapping industry expertise for the greater good: The Cleangredients partnership spearheaded by the green design nonprofit GreenBlue, and the Business-NGO Working Group for Safer Chemicals and Sustainable Materials are both examples of how companies are engaged in making products that do no harm, or at least less. And one of the oldest green chemical certifications — the EPA's Design for Environment program — is showing encouraging and sustained growth.

While the data we found this year are both inconclusive and mildly discouraging, the anecdotal evidence suggests that progress is happening behind the scenes. As the U.S. catches up with Europe legislatively (the E.U.'s REACH legislation has banned more than 11,000 chemicals from use), companies that are ahead of the curve on cutting down toxics will find themselves ahead of the pack.

Industry groups, sector leaders and nonprofits are tackling the use of toxics from all corners, with some notable successes.

Design for Environment Certified Products 1999-2008



Source: U.S. Environmental Protection Agency

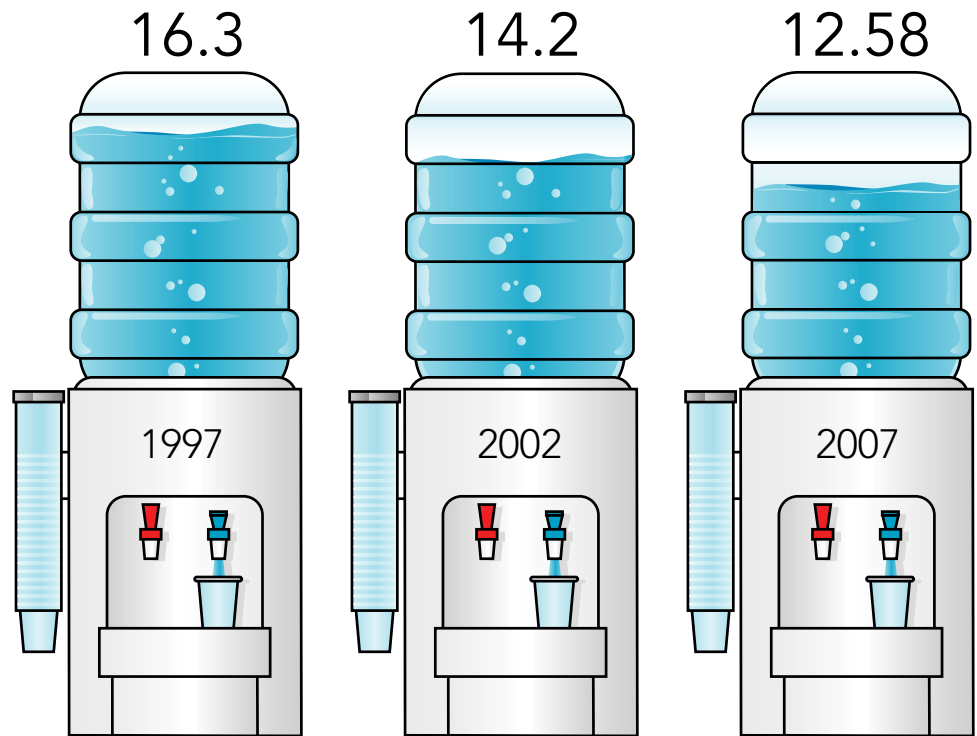
Water Intensity

Progress Is
More Than a
Drop in the
Bucket



Water Use

Gallons consumed per dollar of GDP



Source: The Freedonia Group

Water, as you may have heard, is the next carbon. Our unquenchable need for it, its limited nature, and the increasing pressures on water supplies are conspiring to make this substance one of the bigger and more pressing issues on companies' financial and environmental radars in coming years.

Judging from the graphic above, based on data collected by the Freedonia Group, efforts to do more with less water have met with some success. In the past 10 years alone, the water intensity of the U.S. economy has dropped by nearly 25 percent — that is, it takes almost one-fourth less water to provide the same level of economic activity. If we were to look back into the 1980s and even before, we'd see that the overall water intensity of the economy has improved much more significantly, as industry has started to recognize not just the relatively high cost of wasting water, but also the financial savings that flow from using it more efficiently.

Breaking down the results by some industries can help illustrate the scale of the improvements. Utilities are notable examples: between 1997 and 2007 the

Internet Age drove up electricity use for just about every business and most individuals while the U.S. population grew by 12 percent — more than 34 million people — but the water used to generate power trickled up less than 5 percent.

This type of significant improvement in smart water use highlights how companies across industries are incorporating more efficient water-use methods, especially closed-loop water systems that can recycle water with almost no loss. But it's not just utilities: Whether you look at the amount of water needed to manufacture a ton of paper or a ton of steel, industries are getting more efficient as time passes.

The improvements can be attributed both to cost-savings goals, as water gets more expensive to use and treat, but also to reputational issues around extracting water unsustainably from local aquifers and reservoirs or polluting local water supplies. Perhaps the best cases in point come from companies in the water-intensive food and beverage industries: In 2008, Coca-Cola, Anheuser-Busch and Nestle Waters North America all announced goals to cut the water intensity of their product lines in the coming years.

Municipal activity is rising with the tide as well. Denver's water agency was honored for its efforts in conservation, while city and state governments across the U.S. implemented plans to capture rainwater before it goes back to groundwater supplies. And municipal water usage, which is dependent on literally 300 million individual factors — that is, the country's residents — is seeing steady improvement as usage drops even while the population climbs, in part by encouraging smarter choices and making water conservation the easy option. For example, if every American household switched out a top-loading washing machine for a state-of-the-art front-loading machine, which use 60 percent less water, they'd collectively save \$3 billion annually in water bills, according to General Electric.

Although overall water use is still a difficult indicator to gauge on a year-over-year basis, the progress we've seen in the past 10 years amounts to more than a drop in the bucket, and all signs point to a coming high tide of water efficiency through increased awareness and technological innovation.

The improvements can be attributed both to cost-savings goals, as water gets more expensive to use and treat, but also to reputational issues around extracting water unsustainably.

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