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About This Issue

Sea Gate Land Ventures LLC

An example of the greening of U.S. corporations, Sea Gate Plaza is designed to be the first green commercial building in Fort Lauderdale, Florida.

This issue of *eJournal USA* delves into what those familiar with the history of the environmental movement in the United States might see as a surprising trend — the way U.S. corporations in recent years have embraced environmentally friendly ways of doing business. What prompts a corporation to "go green"?

"We looked across our company and recognized that a focus on environmental technology could be a big business initiative for the company," said Jeffrey Immelt, the chief executive of General Electric, a leader in this field. "The concept we worked on at the time was this notion that green is green." So the environment has become a business opportunity, a chance to increase profits, the core of any business enterprise.

But the story of converting corporations to green policies is more complex than that. Nongovernmental organizations (NGOs), consumers, investors, new technologies, and government policy have all played a role. NGOs and businesses are finding ways to work together to protect the environment, particularly though developing standards and green certification programs. Some corporations are responding to the desires of consumers to buy products with less impact on the environment — in their creation, packaging, marketing, use, and disposal. Many investors, too, are choosing to put their money into green businesses — sometimes for idealistic reasons; sometimes because they see that sustainable practices are actually more profitable in the long term. Recent developments in technology have made it easier to protect the environment, and many businesses have learned that a sustainable supply chain is a valuable asset. Government policies have certainly played a role, but that is not the primary focus of this journal.

Jeffrey Immelt explains the movement best when he elaborates on his company's thinking: "This is no longer a fringe topic. It's no longer a niche topic. This is now a mainstream topic that is being driven across the broad economy. Second, the technology and the service solutions are real. Some may take time to put into place, like coal gasification, sequestration, or hybrid technologies, but they are technologies that can be commercialized over the next 5 or 10 years. Finally, this interest has accelerated — sometimes driven by public policy — things like renewable performance standards. But a lot is driven by businesses that finally said, 'Let's get ahead of this theme. Let's get ahead of the trend. Let's invest before we have to because we see it coming.' "

— The Editors

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U.S. Companies Embrace Green Technology

Paul Nastu

For as long as companies have manufactured goods, they have looked for ways to reduce costs. Corporations are beginning to realize that developments in technology are making it easier for green choices to lead to increased profits.

Paul Nastu is publisher and managing editor of Environmental Leader, *an online publication that describes itself as the "executive's daily green briefing"* [www.environmentalleader.com].

Energy efficiency was about increasing profits before it was about saving the planet. Today, it takes less than half the energy to produce a dollar of economic output as it did in 1970, according to recent research from the American Council for an Energy-Efficient Economy. Over the past 20 years, steel manufacturing has seen an energy-efficiency improvement of 167 percent. The energy efficiency of computer systems has improved an incredible 2.8 million percent.

In other words, for as long as companies have manufactured goods, they have looked for ways to lower costs.

Of course, times have changed. There is new impetus for U.S. companies to make energy-efficient, or green, choices. The global scientific community has declared that global warming is very likely man-made and that the Earth's climate and ecosystems are already being affected by greenhouse gases.

What's more, public opinion seems to have turned, and people are calling for corporations to make changes. Some consumers have stated that they're even willing to pay more for corporations to produce greener products. According to Forrester Research, 12 percent of U.S. adults — some 25 million Americans — are willing to pay extra for consumer electronics that use less energy or come from a company that is environmentally friendly.

© AP Images/Mark Lennihan

Citigroup has adopted power-saving measures that are designed to save nearly $100 million annually.

Green Building

Companies are taking green building — and the subsequent savings in energy, natural resources, and money — seriously. New technologies and the increasing importance of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification program, as well as new efficiency codes, are helping to drive corporate adoption.

The savings to companies can be large. Financial conglomerate Citigroup, with a real estate portfolio equaling 8.5 million square meters worldwide, has adopted such power-saving measures as turning off escalators in the lobbies of buildings and redesigning bank branches to include more natural lighting and recycled materials. The company says it can save as much as $1 per 0.09 square meter a year, or nearly $100 million annually, by making its offices use less energy.

That kind of potential savings is driving retailers such as Wal-Mart, Target, Starbucks, Best Buy, Lowe's, and REI to build prototype green-building stores. Best Buy claims that in the future, it will build only eco-friendly stores, certified by the USGBC through LEED.

Office equipment retailer Office Depot says that it has reached a 10 percent absolute reduction in carbon dioxide emissions from natural gas and electricity consumed in its North American retail stores, warehouses, and offices by installing more energy-efficient technology.

The Frito-Lay plant in Modesto, California, uses these solar panels to provide the energy to bake an estimated 145,000 bags of SunChips per day.

© AP Images/Rich Pedroncelli (2)

parking areas of its research campus in Sunnyvale, California. Once completed in 2008, Applied Materials' system will generate more than 2,330 megawatt-hours annually — enough to power 1,400 homes.

West Virginia Alloys, the largest silicon producer in the United States, has contracted with Recycled Energy Development to build an electricity-generation system that captures hot gases coming from silicon furnaces to make steam and run generators.

Green Energy

Technology advances are also leading U.S. corporations to increase the amount of alternative energy they use. And government incentives are making alternative energy, such as solar and wind power, economically feasible.

Google expects to invest hundreds of millions of dollars in renewable energy projects. The goal of the Internet search giant's RE<C (for Renewable Energy Cheaper Than Coal) initiative is to develop electricity from renewable energy sources that will be cheaper than electricity produced from coal. Google will focus initially on advanced solar thermal power, wind power, enhanced geothermal systems, and other potential breakthrough technologies.

Companies are also finding less expensive ways to incorporate green energy. Potato chip and snack-food maker Kettle Foods has installed 18 wind turbines on the roof of its new Beloit, Wisconsin, manufacturing facility. The turbines are projected to generate approximately 28,000 kilowatt-hours of power each year — enough to produce 56,000 bags of potato chips.

The nano-manufacturing technology firm Applied Materials is installing more than 1.9 megawatts of solar power generation capability on the open roof space and

And at its plant in Casa Grande, Arizona, snack-food producer Frito-Lay will use methane gas to run the plant's boiler. In addition, the company will build at least 20 hectares of solar concentrators and a biomass generator.

Green Operations

To understand just how serious businesses are about reducing the amount of energy they use to run their operations, you need look no further than General Electric Company. GE has pledged to invest $1.5 billion annually on ecomagination research and development by 2010. One of four GE ecomagination commitments originally made in 2005, R&D investment has reached more than $2.5 billion since the program's inception. In May 2007, GE announced that it had doubled sales from environmentally friendly products to $12 billion over the previous two years.

© AP Images/Mike Groll

Danielle Merfeld, seen here amid solar panels in Niskayuna, New York, leads GE Global Research's solar research efforts. General Electric is one of a group of corporations working under a federal program to make solar energy cost competitive by 2015.

Wal-Mart is measuring the amount of energy used to create products throughout its supply chain, including the procurement, manufacturing, and distribution process. The retailer is initiating a pilot with a group of suppliers to look for new ways to make its entire supply chain more energy efficient.

SC Johnson, a leading cleaning products manufacturer, recently completed a transportation-logistics project that eliminated 1,882 tons of greenhouse gases over a 12-month period, used 2,098 fewer trucks, reduced fuel usage by 168,000 gallons, and saved approximately $1.6 million.

What's Ahead

Corporations are beginning to realize that green choices can mean increased profits. Some industry insiders believe that a sudden decrease in energy costs will not necessarily mean the end of the adoption of green technology, as was the case in the 1970s when U.S. companies dabbled in green. What's more, as the United States moves closer to some form of cap and trade (a system that provides economic incentives for pollution reduction), the adoption of green technologies by corporations is bound to increase. ■

The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

Corporate Executives on Going Green

© AP Images/Mark Lennihan

The headquarters of Apple Inc. are located in Cupertino, California.

Rick Wagoner, GM (General Motors Corporation) chairman and chief executive officer (CEO)

"The key as we see it at GM is energy diversity — being able to offer our customers vehicles that can be powered with many different sources of energy. We must — as a business necessity — develop alternative sources of propulsion, based on alternative sources of energy, in order to meet the world's growing demand for our cars and trucks." (2007, Geneva Motor Show) *[http://www.autobloggreen.com/2007/03/06/geneva-motor-show-rick-wagoner-affirms-commitment-to-energy-div/]*

H. Lee Scott, Wal-Mart president and CEO

On the motivation behind the corporation's setting long-term sustainability goals: "I think two things happened. One, as we [looked] at our responsibility as one of the world's largest companies, it just became obvious that sustainability was an issue that was going to be more important than it was, let's say, last year and the years before. I had embraced this idea that the world's climate is changing and that man played a part in that, and that Wal-Mart can play a part in reducing man's impact. We recognized that Wal-Mart had such a footprint in this world, and that we had a corresponding part to play in sustainability." (2006, MSNBC interview) *[http://www.msnbc.msn.com/id/1231672 5/]*

Chad Holliday, DuPont chairman and CEO

"DuPont is committed to creating innovative materials that help builders and architects produce sustainable 'green' buildings that cost less to operate, are easier to maintain, and provide better comfort year round. At

DuPont

DuPont scientist Max Li develops new biofuels in the state-of-the-art fermentation laboratory at the DuPont Experimental Station in Wilmington, Delaware.

DuPont we are proud of a decade of reducing our environmental footprint. We have come a long way, certainly in reductions of waste and emissions, but also in recognizing the impact of our operations on global issues such as climate change. We define this direction as sustainable growth — the creation of shareholder and societal value while decreasing our environmental footprint along the value chains in which we operate." (DuPont Web site) *[http://www2.dupont.com/Tyvek_Construction/en_US/products/residential/products/greendesign_resi.html]*

Steve Ballmer, Microsoft CEO

Explaining that PCs and other technology still consume far too much electricity, Ballmer said: "The lowering of energy consumption is as important for us as new uses of software and IT for the environment." (2008, CeBit Technology Show in Hannover, Germany) *[http://www.news.com/Ballmer-Microsoft-is-thinking-green/2100-1 1392_3-6233152.html?tag=item]*

Steve Jobs, Apple CEO

"It is generally not Apple's policy to trumpet our plans for the future; we tend to talk about the things we have just accomplished. Unfortunately this policy has left our customers, shareholders, employees, and the industry in the dark about Apple's desires and plans to become greener. Our stakeholders deserve and expect more from us, and they're right to do so. They want us to be a leader in this area, just as we are in the other areas of our business. So today we're changing our policy." (Apple Web site) *[http://www.apple.com/hotnews/agreenerapple/]*

Jeffrey Immelt, GE (General Electric) chairman and CEO

"We looked across our company and recognized that a focus on environmental technology could be a big business initiative for the company. The concept we worked on at the time was this notion that green is green. In other words, the time had come that, through technology, we felt like we could create a good business initiative to focus on conservation and greenhouse gas emission reduction and do good business at the same time." (2007, interview with VerdeXchange News) *[http://www.verdexchange.org/node/82]*

Alan Mulally, Ford Motor Company president and CEO

"Ford Motor Company is committed to producing a full range of fuel-efficient vehicles that emit fewer greenhouse gases, without compromising customers' choices for interior room, performance, or safety. We are focusing on sustainable technology solutions that can be used not for hundreds or thousands of cars — but for millions of cars, because that's how we can truly make a difference." (2007, Los Angeles Auto Show) *[http://www.ford.com/about-ford/news-announcements/featured-stories/featured-stories-detail/ford-mulally-la]*

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The Rise of Corporate Stakeholders

Vasanthakumar N. Bhat

© AP Images/Al Goldis

This General Motors HydroGen3 minivan, shown outside the state capitol building in Lansing, Michigan, has a top speed of 160 kilometers per hour. It is powered by a hydrogen fuel cell and emits only pure water.

In recent years, U.S. corporations have reduced environmental emissions and — in response to pressures from governments, investors, environmental groups, customers, and employees — are developing "cradle-to-grave" pollution prevention strategies. Increasingly, corporate leaders see that managing environmental issues effectively can be a significant source of competitive advantage and sustainable growth.

Vasanthakumar N. Bhat is an associate professor at the Lubin School of Business, Pace University, New York. He is the author of The Green Corporation*:* The Next Competitive Advantage *and* Total Quality Environmental Management: An ISO 14000 Approach*, as well as several articles on environmental management.*

Why do American companies choose to "go green" — that is, institute a set of corporate policies that favor environmental concerns? This is a complex story that requires some understanding of how the environmental movement arose in the United States, the long debate between advocates of regulatory approaches and voluntary compliance, and the current influence of corporate stakeholders such as customers, investors, employees, environmental groups, and government officials. The bottom line is that most American corporations now believe they can create a significant source of competitive advantage and sustainable growth by having effective environmental management. Being "green," in short, is seen as good business.

© AP Images/University of Florida/IFAS, Eric Zamora

These 24 solar panels provide enough electricity to completely power the house in the background, including air conditioning, heat, lights, and computers. Such sources of energy are helping pave the way for dealing with the limits of a carbon-constrained world.

The Debate Over Environmental Policy

Traditionally, from the perspective of policy makers, the environment represents what economists call "a public good" — a shared benefit like national defense from which no member of society can be excluded. Because market systems do not easily produce public goods, many in the U.S.environmental movement have believed that government intervention is necessary to motivate corporations to minimize the environmental impacts of their activities. In recent years, many have also come to believe that market-based approaches, by encouraging investment and technological innovation, are likely to reap greater environmental benefits in the end. The debate over the merits of these two approaches has continued from the inception of the U.S. Environmental Protection Agency (EPA) in 1970 right to the present.

When the environmental movement started in the United States in the 1960s and 1970s, the focus was on compliance with laws and regulations. Consequently, the traditional foundation for U.S. environmental policy has been "command and control" regulations. These regulations aim to prevent environmental problems by spelling out how a company will deal with its pollution. They are implemented using enforcement, compliance, and financial incentives. Since the regulations are mandatory, command and control regimes have been very effective. They have also increased awareness among companies about the environmental impacts of their activities.

These regulations have not been without costs, however. One negative outcome has been to encourage "end-of-pipeline" solutions that reduce pollutants after they have been produced, rather than eliminate them in the first place. In addition, the regulatory approach has led to extensive litigation.

In recent years, policy makers in the United States have increasingly emphasized economic analysis to decide what type of policy instrument to choose. Flexible policy instruments allow companies to choose the most efficient alternatives to achieve policy goals. They have been used to reduce compliance costs and to achieve superior performance at a faster pace. Market-based measures such as emissions trading — a system in which government sets a total limit on a pollutant and then allows market forces to determine how individual companies will meet their share of the limit — have been introduced in the United States for emissions of sulfur dioxides and nitrous oxides, the pollution that causes acid rain. However, these measures are still based on a single media — air, water, groundwater, or land.

More than any other country, the United States uses economic analysis to fine-tune environmental policies, and it has used this analysis to require reduced emissions by several pollution sources, including power plants and diesel engines. The United States does subsidize some aspects of waste minimization, even though, in general, a polluter-pays principle — requiring industry to bear the cost of protecting the environment — is the norm.

New Strategies

From the early days of environmental concern, then, U.S. companies pursued compliance using end-of-pipe abatement-reducing pollution by cleaning up the waste produced. As cleanup became more expensive, companies started working toward pollution prevention — using

materials, processes, and equipment to eliminate the production of waste.

However, pollution prevention by itself did not improve financial performance. The total quality environmental management (TQEM) approach was needed to reap the financial benefits of improved environmental performance. As part of the TQEM approach, companies implemented the environmental management system (EMS), which provides a framework to manage environmental impacts and incorporate environmental concerns into decision making throughout an organization.

More than one in five facilities have implemented EMS, according to a recent survey. In addition, 5,585 facilities have received ISO 14000 certifications that vouch for their compliance with good management practices identified by the International Organization for Standardization (ISO). And some companies are using a range of environmental tools, including environmental auditing and life-cycle analysis. By transferring their environmental expertise to their foreign affiliates and exporting environmentally beneficial technologies, companies are also reducing the global impacts of pollution.

In 2004, the United States consumed energy equivalent totaling about 17 billion barrels of oil, or 60 barrels per capita. About 86 percent of the nation's energy came from oil, coal, and natural gas. Only 14 percent came from nuclear and renewable energy. Rising oil prices and dependence on foreign sources for almost for 65 percent of crude oil have intensified the need for energy conservation and efficiency and for new sources of energy. In addition, burning fossil fuel generates carbon dioxide and other greenhouse gases. So it is imperative for U.S. companies to prepare for a carbon-constrained world.

Currently, the United States generates more than 50 percent of its electricity from coal-fired power plants and has a plentiful supply of coal. American Electric Power is pursuing innovative methods to burn coal cleanly and to sequester carbon dioxide. This will help the industry increase power production with less damage to the environment. Florida Power and Light reduced the need for 10 new power plants by increasing energy efficiency and investing in 42 wind facilities. General Motors is working on developing hydrogen-powered cars that do not produce carbon dioxide. And IBM is working on plans to conserve energy, reduce perflurocompound (PFC) emissions, use renewable energy, encourage alternate employee commuting choices, and improve the efficiency of the company's supply chain.

Market Wire

IBM Vice President Lisa Su shows a Cell microprocessor wafer. A 2007 National Medal of Technology winner, IBM is one of the corporations working to reduce its environmental footprint.

The Power of Stakeholders

The key to modern corporate motivation is a company's concern for building rapport with its stakeholders. Government policy makers, customers, environmental groups, investors, and employees constitute major stakeholders and exert pressures on shaping a firm's environmental strategy. To reach out to these groups, companies use public disclosure and consultations about their activities and their impacts on the environment.

Government: Government regulation is a major driver of environmental policy. Exponential growth in environmental laws forces companies to anticipate and make investments to meet new requirements even before the laws are passed. Most major companies have Washington lobbyists and other staff who maintain access to high-level policy making in order to reduce the likelihood of the U.S. Congress enacting harsh regulations or the environmental agencies enforcing them stringently. Studies show that the facilities that perceive environmental regulations as being stringent tend to have a higher environmental performance. In addition, such facilities are likely to opt for pollution prevention rather than end-of-pipe solutions, and to invest in environmental research and development.

But since flexible programs tend to produce superior environmental results, the EPA has also introduced a number of programs such as p2 *[http://www.epa.gov/p2/]* and partnership programs *[http://www.epa.gov/p2/pubs/partnerships.htm]*. These programs encourage businesses to go beyond minimal compliance with regulations voluntarily in return for reduced costs and public recognition as environmental leaders by the EPA.

Customers: Customers, both as voters and as buyers of products and services, have a significant impact on environmental policy. According to a *USA Today*/Gallup Poll conducted in March 2007, more than 8 in 10 Americans consider that a company's environmental record should be an important factor in deciding whether to buy its products. Corporate buyers such as IBM and Baxter International, as well as government organizations, use the environmental performance of products to make their procurement decisions.

Environmental Groups: More than one in five Americans consider themselves active participants in the environmental movement. Environmental organizations are using their clout to develop tough regulations and also to extend the areas regulated. In addition to lobbying, these organizations can take other actions that encourage companies to be green.

Many of the U.S. environmental statutes incorporate a "citizen's suit" provision that allows a private citizen to sue a corporation for violating a statute or the Environmental Protection Agency for not doing its duty under environmental laws. Any citizen can go to the federal court to prevent a company from violating relevant federal laws or permit terms and to force the company's compliance with these laws. The citizen's suit has significantly increased the clout of green organizations and has attracted many more members in view of these organizations' ability to get results.

Investors: Poor environmental performance can increase costs, because companies that produce large quantities of waste tend to have a higher number of spills and hazardous waste sites, and serious compliance problems. Investors can hold corporations accountable for environmental performance by speaking directly with corporate management, filing shareholder resolutions, and voting against the management. If they are still not satisfied, they can withdraw their investment by selling their stocks.

A number of organizations have developed environmental guidelines for companies to follow. Ceres Principles *[http://www.ceres.org]*, the Equator Principles *[www.equator-principles.com]* for project financing, and the Environment and the OECD Guidelines for Multinational Enterprises *[http://www.oecd.org/dataoecd/12/1/34992954.pdf]* are examples of such guidelines.

In addition, large institutional investors such as pension funds are joining forces to consider the environmental performance of companies before they invest. For example, according to a survey by the Principles for Responsible Investment *[http://www.unpri.org]*, 88 percent of their signatories and 82 percent of asset owners consider environment-related issues before making an investment decision.

In recent years, shareholders have been successful in convincing major banks to consider the environmental risks of projects they consider financing, persuading computer manufacturers to increase the number of computers they recycle, and encouraging public utilities to invest in renewable energy.

© AP Images/Al Behrman

Procter & Gamble, headquartered in Cincinnati, Ohio, defines sustainability as "ensuring a better quality of life for everyone, now and for generations to come."

Employees: Employees bear most of the impact of poor environmental practices. Attracting employees to work in unsafe surroundings is expensive, and workers and their unions often pressure companies to reduce pollution. If employees are ignored, they often respond by changing jobs or by mobilizing public support through whistle-blowing. Costs can also rise because of higher employee turnover. Companies respond by providing employee training on environmental health and safety and on environmental management systems.

Moving Toward Sustainability

While there has been significant growth in the U.S. economy in recent decades, environmental performance is mixed, as reported in the Environmental Protection Agency's *2007 Report on the Environment: Highlights of National Trends*.

One area of improvement is release of toxic chemicals. According to the EPA's *2005 Toxics Release Inventory (TRI): Public Data Release*, U.S. industries discharged 4.34 billion pounds of about 650 toxic chemicals in 2005. Two industries, metal mining and electric utilities, accounted for more than half of these releases. Total chemical releases in 2005 by manufacturing facilities fell by 58 percent from those of 1988, even though the number of facilities decreased by only 16 percent and the real value of shipments increased by about 13 percent. In addition, almost half of the production-related waste was either recycled or converted into energy in 2005.

Other signs of improvement: U.S manufacturers spent $14.6 billion on pollution abatement capital and operating expenditures in 1999, representing 0.4 percent of the value of shipments and about 10 percent of new capital expenditures. American companies are beginning to see green technologies as a source of profits, exporting more than $30.4 billion in environmental technologies in 2006.

For centuries, environmental degradation has gone hand-in-hand with industrialization. As a result, over time

© AP Images

These wind turbines are located on the Oregon-Washington border and are part of the Stateline Wind Project that produces enough power to light 70,000 homes. The turbines belong to Florida Power and Light (FPL), a leading clean-energy provider that operates natural gas, wind, solar, hydroelectric, and nuclear power plants in 25 states.

corporate policy makers have come to the realization that environmental issues are an integral part of a company's economic well-being. Many corporate executives now feel that environmental protection is essential to sustainable development and to creating a better world. Sustainability — ensuring a better quality of life for everyone, now and for generations to come, as defined by manufacturing giant Procter & Gamble — is being seen as both a business responsibility and a business opportunity in most corporate boardrooms across America.

Even though companies have focused on pollution treatment and pollution prevention in the last decades, attention has now shifted to carbon dioxide emissions and alternate energy, and this trend is likely to continue in the future. The rising price of crude oil and dependence on a significantly high percent of imported crude oil are accelerating the need for quicker solutions to these problems.

The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

NGOs and Business — Shared Goals, Mutual Trust

Brad Kenney

© AP Images/Joel Page

The National Resources Defense Council, a major environmental NGO, has praised Willard Beach in South Portland, Maine, for the city's water-quality monitoring program.

Although their friendship is relatively new, nongovernmental organizations and the business community are working together these days to forge partnerships that last.

Brad Kenney is technology/environmental editor with Industry Week *magazine.*

The past two decades have brought an increase in public consciousness in the United States concerning the rising threats of global issues such as climate change and resource conservation. This same time period has also seen a flowering of the relationship between the global business community and nongovernmental organizations (NGOs), especially those whose mission is to engage the business world in order to save the planet.

What Is an NGO?

Nongovernmental organizations are loosely defined as nonprofit organizations that exist outside the control of any government, business, political party, or armed group. They can range from highly structured global organizations to loosely knit groups of local activists. Many of the best-known NGOs focus on environmental issues, while others — such as Doctors Without Borders and Amnesty International — focus on other issues of concern to the world community, such as providing

© AP Images/Elizabeth Dalziel

In June 2007 in Beijing, China, Coca-Cola Chief Executive Officer E. Neville Isdell announced that Coke is funding a $20-million project to conserve seven major rivers worldwide and also revamping its bottling practices to reduce pollution and water use. This project is coordinated with the World Wildlife Fund (WWF).

medical assistance to or championing the human rights of people in need. Their funding often comes from membership dues or grants from international institutions or governments. Most observers agree that as globalization has turned the world into one interconnected network, NGOs have been effective in filling in the spaces between where government ends and business begins.

NGOs and the Business Community

The business world has not always been very receptive to the pressures being put on it by outside agencies, including environmentally oriented NGOs. In fact, for most of the last century, an atmosphere of distrust and mutual suspicion existed in both camps, which often stood in the way of much progress by either group. However, as global environmental issues have risen in prominence, a growing level of alarm over the increasing effects of climate change (and the potential for even more dramatic effects to come) has brought about a new era of communication and cooperation between the business and the NGO communities worldwide — and especially in the United States.

The fruits of these budding partnerships are bountiful for both sides. For instance, while the global business community presently accounts for a large environmental impact, it also has the capital resources and working efficiency to make great strides in improving operations and lessening its footprint. Unfortunately, this potential for environmental benefits can be mitigated by the very nature of the business environment. Because businesses specialize in maximizing shareholder profits in the short term, they simply may not possess the knowledge and expertise necessary to make their operations more sustainable in the long term.

NGOs, on the other hand, may not have the resources to fund large-scale improvement projects themselves. But they are staffed by subject-matter experts who can work within their organizations, as well as with the broader business community, to develop policy positions and best practices for companies and governments to follow.

Suzanne Apple, World Wildlife Fund's (WWF) vice president and managing director for business and industry, says that in recent years her organization has begun to see greater potential in working with business, rather than against it. "I think one of the things we realized is the power of the marketplace," Apple observes. "For example, if we can get the buyer community to agree to follow responsible purchasing guidelines for forestry products, we can have a greater impact than if we were out in the forests trying to stop illegal logging."

Additionally, Apple sees increased pressure from government regulations driving businesses to step up their efforts in conservation and impact reduction — issues that NGOs are in a unique position to assist them with. "With the advent of Sarbanes-Oxley and other corporate transparency regulations, businesses are looking to third parties to assist them in auditing their operations in a credible manner," Apple says.

Shared Goals

One good example of the beneficial nature of the NGO-business partnership comes from the work that the Washington, D.C.-based nonprofit Environmental Defense is doing with the world's largest retailer, Wal-Mart Inc. The shared initiative focuses on five areas: global warming, fish farming, reducing packaging waste, alternative fuel usage, and global factory operations.

Because it is necessary for human existence, water conservation is another issue that is high on the NGO agenda. In 2007, WWF signed an agreement with global beverage giant Coca-Cola Company to launch a worldwide initiative to conserve water resources and replace the water used in the production of its drinks.

And as global trade continues to grow, the NGO community is taking steps to ensure that trade is free and fair, as well as practiced sustainably, among the nations

of the world. The U.S. Business Council for Sustainable Development (USBCSD — a regional arm of the World Business Council for Sustainable Development) — has in the past few years undertaken a number of outreach opportunities designed to strengthen the environmental protection aspects of global trade, particularly the growing trade between the United States and China. Whether bringing Chinese cement industry representatives to tour state-of-the-art U.S. factories, or working to develop a U.S.-China Sustainability Center for improving information exchange and collaboration between the two trading partners, the USBCSD has updated its focus to reflect the changing priorities of our changing times.

Shared Opportunities

By engaging in strategic partnerships such as this with heavyweights in the U.S. business community, these and other NGOs are advancing a multifaceted environmental agenda with an impact that stretches far beyond the influence they and their members could hope to have.

In return, U.S. companies that participate in and help develop these partnerships are getting invaluable assistance in implementing comprehensive environmental impact reduction programs, and they are doing so in a way that often allows them to measure and report their improvements to their suppliers, to the government, and, ultimately, to U.S. consumers — an increasing number of whom are demanding such progress from the companies whose products they purchase.

© AP Images/Donna McWilliam

The NGO Environmental Defense has been working with Wal-Mart, which built this experimental environmentally friendly supercenter in McKinney, Texas.

This ability to adapt to the changing needs of both business and the environment truly demonstrates the type of flexibility that only a strong partnership, built on mutual goals and shared trust, can provide. ■

The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

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The rainwater that drains into this holding pond through pervious pavement at the Wal-Mart supercenter in McKinney, Texas, is used to nourish the landscape.

Consumers Demand Green

Traci Purdum

© AP Images

The first Earth Day in New York City, April 20, 1970.

Many consumers are recognizing that their consumption affects the environment, and they are pressuring corporations to reduce the negative effects of their operations.

Traci Purdum is the editor-in-chief of HVACR Business*, a monthly business-management magazine geared toward heating, ventilation, air conditioning, and refrigeration contractors.*

As an American business journalist, I am required by my job to be aware of consumer trends. No matter what industry I am writing for, it is the end customer that makes or breaks the free market.

Unfortunately, some consumers are fickle. The must-have widget of today will turn into tomorrow's trash — either through the natural course of fading fads or the oftentimes maddening phenomenon of instant obsolescence.

But, increasingly, consumers seem to be recognizing what their consumption does to the environment. These consumers are smart, and they want the companies with which they do business to be smart as well. That means not only creating products that help consumers organize their lives, achieve personal and business success, look their best, feel their best, and make them the envy of the neighborhood, but also that help them lower their carbon footprint.

This year marks the 38th anniversary of Earth Day, which was the brainchild of a U.S. senator who aimed to bring environmental concerns to mainstream America.

As reported on the Earth Day Network's Web site, at the time of the first Earth Day "Americans were slurping leaded gas through massive V-8 sedans. Industry belched out smoke and sludge with little fear of legal consequences or bad press. Air pollution was commonly accepted as the smell of prosperity. Environment was a word that

© AP Images/Lenny Ignelz (2)

This green home uses a solar electric power system with photovoltaic cells on the roof. Its environmentally conscious construction also features Lyptus wood floors made from trees that will regenerate in 20 years.

appeared more often in spelling bees than on the evening news."

While the message was slow to make an impact back in the 1970s, in today's world it is difficult not to be aware of — or at least curious about — the impact we are having on our limited resources. And it is that concern that has companies catering to consumers' desires to be less offensive to the environment.

Building Green

Indeed, "green" is the new buzzword making its way into the mainstream via commercials, television shows, company dossiers, and conferences.

To be sure, at the end of 2007 I attended the U.S. Green Building Council's Greenbuild International Conference and Expo held in Chicago. The event attracted more than 20,000 environmentally conscious builders, architects, students, and media — all there to witness the sea change of the building industry.

To kick off the conference, former President Bill Clinton announced to a global audience several new partnerships to improve the energy efficiency of hundreds of millions of square meters of public and private real estate throughout the United States.

The environmental initiative has made its way to an industry infamous for depleting forests and gobbling up green spaces. Why? Because consumers demand it.

Manufacturing Green

And what consumers want, consumers get. Indeed, manufacturers are designing for the environment in order to capture consumers' dollars.

General Electric Company, for example, has undertaken an ecomagination campaign to highlight the company's focus on a cleaner environment. And Nike Inc. has launched the Nike Environmental Action Team to focus on recycling, education, and innovative programs such as Reuse-A-Shoe, which recycles shoes and turns them into new products. These companies understand the power of green and what it means for their bottom lines. Being last to market with concern for resources is irresponsible at best.

But it isn't merely being environmentally friendly that matters. Companies know that the power of marketing green products is worth more to the bottom line than lowering their carbon footprints.

Touting a "greener Apple," Steve Jobs, Apple Inc.'s chief executive officer, recently penned a letter to customers noting that his company "has been criticized by some environmental organizations for not being a leader in removing toxic chemicals from its new products, and for not aggressively or properly recycling its old products. Upon investigating Apple's current practices and progress toward these goals, I was surprised to learn that in many cases, Apple is ahead of, or will soon be ahead of, most of its competitors in these areas. Whatever other improvements we need to make, it is certainly clear that we have failed to communicate the things that we are doing well."

Some pundits in the electronics industry note that the most Earth-friendly thing a company can do is increase the length of time between new hardware purchases. In the future, consumers are going to enjoy the fruits of a battle among electronics makers who are vying for their dollars via upgrades rather than whole new — and expensive — purchases.

Traveling Green

Interestingly, consumers' concerns aren't just focused on products. How they travel and where they stay for business and holidays also may be determined by environmental impact.

Green travel and green hotel sites are popping up all over the world and are attracting more than tree-hugging globetrotters. Even casual travelers have been introduced to green initiatives in subtle ways. From the hotel room placards that urge guests to reuse bath towels and resist having housekeeping change bedsheets daily in order to conserve water, to paperless checkouts, the travel and tourism industry is cashing in on being environmentally sound. Consumers are able to feel good about their stay at a green hotel, and hotels are able to slow down their water and electric meters and enjoy smaller utility bills.

But what about air travel? Aircraft pollution in the form of ozone-depleting nitrogen and carbon dioxide has many consumers thinking twice about their mode of transportation. How do they tread lightly upon the Earth and still enjoy the convenience of airplanes?

A recent trend is carbon-offset programs. These programs are aimed at guilt-laden consumers wanting to erase their environmental sins.

For example, Continental Airlines recently launched a carbon-offsetting program, developed in partnership with nonprofit Sustainable Travel International. The voluntary program allows customers worldwide to view the carbon footprint of their booked itinerary, which Sustainable Travel International calculates from the fuel consumption of Continental's aircraft. Travelers then can make a contribution to Sustainable Travel International via one of four project portfolios:

- Gold Standard emission reduction projects managed by MyClimate, which are renewable energy and energy-efficiency projects validated, registered, and verified following Clean Development Mechanism principles under the Kyoto Protocol
- International reforestation projects that preserve and create critical forests and that are designed using the standards set forth by the Climate, Community, and Biodiversity Alliance
- U.S. Green-e certified renewable energy projects, such as wind farms
- Or a combination of these projects.

The Green Bottom Line

What started as our ancestors' dreams to fly like birds, erect buildings that touch the sky, and pave trails across the globe grew into massive industries that in their infancy disregarded their effect on the environment — all in the name of progress. Now, like the phoenix rising from the ashes of its past lifecycle, industry is taking its cue from the environment and is attempting a rebirth — all in the name of consumer demand. ■

The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

The 2008 Earth Day poster, created for the U.S. Department of State by Cheryl Griesbach.

GREEN BUILDINGS

© AP Images/Matthew S. Gunby

The Chesapeake Bay Foundation's Phillip Merrill Environmental Center in Annapolis, Maryland, has won national recognition for its pioneering conservation efforts and has drawn visitors from around the world looking for ideas they can take home.

© AP Images/Alden Pellett

NRG Systems, a leader in wind measurement technology, included features such as solar panels and a cooling pond in its energy-efficient headquarters in Hinesburg, Vermont.

Albanese Organization

The Visionaire, shown here in an artist's rendering, is a luxury green condominium tower in New York City.

© AP Images/Keith Srakocic

The design of PNC Bank's branch in Tarentum, Pennsylvania, uses natural light and recycled materials as part of a green building prototype the company is using to build new branch offices.

© AP Images/Stan Gilliland

This skylight, one of many green improvements to the 1920 Brown & Jones Architects' building in Raleigh, North Carolina, tracks the sun and moves reflectors accordingly to direct light into the offices below. It is surrounded by sedum plants, which help hold rainwater on the roof for cooling.

Foto/Las Vegas Springs Preserve

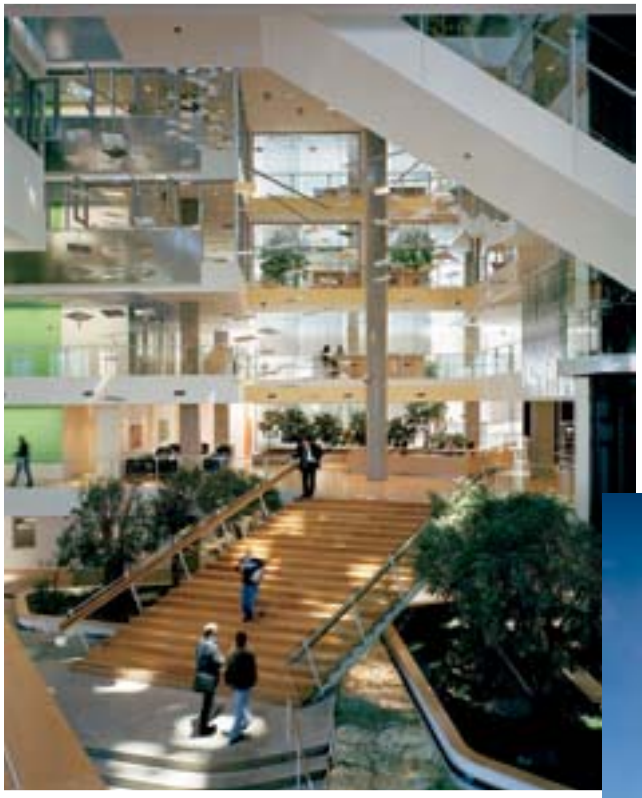
The Las Vegas Springs Preserve is a 72-hectare national historic site with seven green buildings that meet platinum LEED (Leadership in Energy and Environmental Design) certification, the best rating from the U.S. Green Building Council.

Michelle Kaufmann Designs, MBR Studio

In this affordable, prefabricated small-lot home, the mkSolaire™ by Michelle Kaufmann Designs, the roofs and windows sculpt natural light and fresh air into the center of the home. The nontoxic, recyclable, and renewable materials require less energy to build and to maintain.

© AP Images/Gene J. Puskar

The David L. Lawrence Convention Center in Pittsburgh, Pennsylvania, has a sloping roof designed to pull cool air from the Allegheny River into the building and to allow hot air to rise and leave through roof vents.



The Genzyme Center, world headquarters for the biotechnology firm Genzyme Corporation, is one of the largest buildings to receive the platinum rating from the U.S. Green Building Council. The building's extensive use of natural light helped produce a 42 percent reduction in annual electricity costs.

Genzyme Corporation (2)

© AP Images/Nam Y. Huh (2)

These students and their teacher at Tarkington Elementary School in Chicago, Illinois, will enjoy the benefits of this living, green roof atop the school's gymnasium. Its soil and vegetation provide insulation that keeps the building warm in winter and cool in summer.

Business, Investors, and the Environment

Matthew Patsky and Elizabeth Levy

© AP Images/Richard Drew

Assistant Secretary for Energy Efficiency and Renewable Energy Andy Karsner (second from the right) joins corporate executives in the opening bell ceremonies of the New York Stock Exchange for the initial public offering of Global Alternative Energy Exchange-Traded Fund in May 2007.

Green investing, or investing with the environment in mind, is an evolving practice with a rich history. It has grown to include evaluating a company's environmental profile. Many investors use their investments to promote a green agenda.

Matthew Patsky is partner and portfolio manager, and Elizabeth Levy is senior environmental analyst, with Winslow Management Company, a firm that specializes in green investing.

Investors play an important role in advancing the environmental activities of the companies in which they invest. Green investing, or investing with the environment in mind, is an evolving practice with a rich history. No longer just referring to avoiding companies with historical environmental liabilities, environmental investing has grown to include evaluating a company's environmental profile to aid in research on topics including projecting future growth, analyzing preparation for upcoming regulations, and assessing risk preparedness. And many green investors are not shy about using their investments to promote a green agenda.

Risk-focused Attention

During the first wave of environmental investing in the 1980s and early 1990s, environmental investors were concerned primarily with evaluating environmental activities from a risk perspective. The massive losses from asbestos-related claims — estimated to be more than $250 billion in the United States alone, as reported in *The Economist* in 2005 — prompted some investors to include environmental liabilities in their financial analysis, such as responsibility and provision for remediation of sites contaminated with hazardous waste that are deemed Superfund sites by the federal government. Investors began incorporating other environmental data points into their thinking, such as use and emissions of toxic and hazardous chemicals. Research organizations such as KLD and the Investor Responsibility Research Center (now

part of RiskMetrics Group) provided investors with data on environmental regulatory compliance and violations, emissions of toxic chemicals, and environmental management programs.

Today, environmental investors consider not only retrospective risk from past activities and emissions, but also future environmental risks, particularly related to climate change. For many environmental investors, as well as many environmentalists, climate change has emerged as an overarching concern that encompasses others, such as fresh water use and shortage, destruction of animal habitats, and air pollution.

For the companies that investors analyze, climate change presents a series of challenges for both current business and future planning. For example, according to the weather-risk management consultancy Storm

The Superfund

In 1980, 10 years after the first Earth Day, the U.S. Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which authorized the "Superfund," the federal government's program to clean up the nation's uncontrolled hazardous waste sites. It has allowed the federal government to help cities and states clean up the nation's most dangerous toxic waste sites.

To do this, the Environmental Protection Agency (EPA) works closely with communities, potentially responsible parties (polluters), scientists, researchers, contractors, and state, local, tribal, and other federal authorities. Working with these groups, EPA identifies hazardous waste sites, tests the conditions of the sites, formulates cleanup plans, and begins cleaning up identified sites.

New sites are added each year; some sites deleted from the list have been put back on the list for further cleanup. Controversies exist about its funding mechanism, its definition of "cleanup," and other issues. Still, Superfund is the first program in the world to tackle a country's 150-year industrial legacy and to make those responsible for the waste pay to clean it up.

Before Superfund

Love Canal is a neighborhood in Niagara Falls, New York. In the 1970s, the neighborhood had a high rate of cancer cases and birth defects. Local schoolchildren constantly were ill. The residents eventually discovered that a nearby canal was a toxic chemical dumping site. By 1978, Love Canal had drawn national media attention, and newspaper articles were calling the neighborhood "a public health time bomb."

The same year — because there was no other legal way for the federal government to help the state of New York with an environmental problem — then-President Jimmy Carter declared a federal emergency at Love Canal.

Eventually, the government relocated more than 800 families and reimbursed them for their homes. The polluter's parent corporation, Occidental Petroleum, spent more than $200 million to clean up the site, and Congress passed the law establishing Superfund in 1980.

Superfund Today

According to Katherine Probst, senior fellow and director of Risk, Resource, and Environmental Management at Resources for the Future (an environmental policy research group in Washington, D.C.), "Most of corporate America is much more aware of the costs of not managing hazardous substances well, and Superfund liability [for polluters] has had a huge deterrent effect." Seventy percent of cleanups, she added, are paid for directly by responsible parties.

Superfund liability, Probst said, "does provide a very clear and very real incentive to manage hazardous substances properly. And that is really the purpose of a liability system, so in that sense it has been hugely effective."

— *Cheryl Pellerin is a staff writer with www.america.gov.*

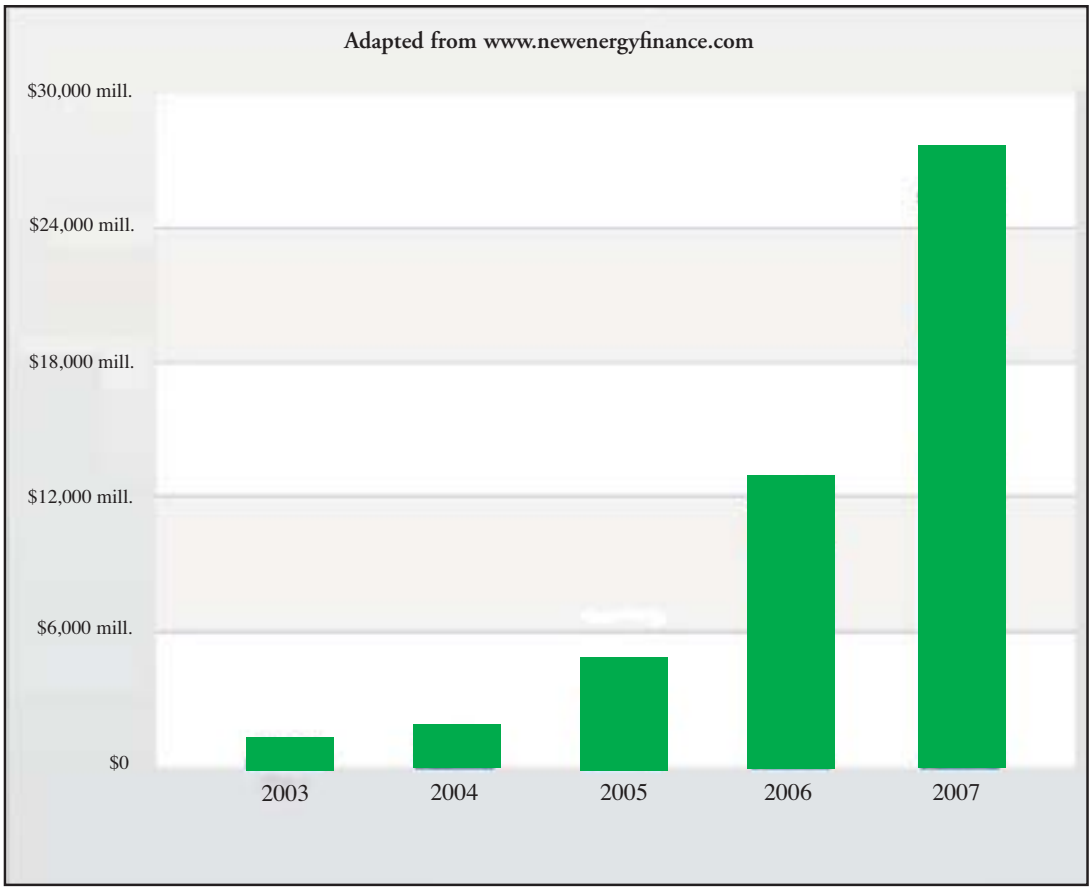
Exchange, a two-degree rise in average temperature during autumn can result in a 1 percent drop in same-store sales, a key measure that financial analysts use to judge retailers. In September 2007, the temperature was on average two degrees warmer than normal, and October 2007 had the slowest October retail sales growth in 12 years, according to the International Council of Shopping Centers.

Climate and environmental concerns are also affecting the thinking of the private equity investors that buy and sell companies. In January 2007, the Texas energy company TXU Corp. was purchased by Goldman Sachs and private equity firms Texas Pacific Group and Kohlberg Kravis Roberts. Notably, the buyers announced that they had consulted with leading environmental groups Environmental Defense and Natural Resources Defense Council, and they had agreed to cut back a controversial plan to build 11 new coal-fired power plants to a more acceptable plan for three new plants as part of the purchase agreement. With plans for new coal-fired plants having been rejected by governments in Kansas, Oklahoma, Florida, and Washington State by the end of 2007, TXU's investors' agreement seems almost prescient.

New Opportunities

But instead of just looking to environmental information to help analyze risks, a new wave of environmental investors are looking at environmental protection as an opportunity, and they are investing in market sectors that barely existed even a few years ago. For example, direct investment in alternative energy-related publicly traded companies, such as through initial public offerings (IPOs) or secondary public offerings, totaled less than $1 billion globally in 2004, according to research firm New Energy Finance (NEF). In 2007, that amount soared to almost $25 billion (see chart). In 2007 alone, this flow of investment dollars directly to companies allowed the expansion of solar cell factories, the

Direct Investment in Alternative Energy-Related Publicly Traded Companies



© AP Images/Bill Sikes

This 1994 sign on the fence of the Love Canal dump in Niagara Falls, New York, warned visitors to keep out because of danger from hazardous waste.

© AP Images/David Duprey

In 2004, a Niagara Falls resident walks along a street near the Love Canal site, which had recently been removed from the Superfund list.

development of wind farms, the purchase of run-of-river hydroelectric projects, the planting of fuel crops, research into fuel cell commercialization, and the development of geothermal power plants, among others.

The flow of capital to these firms working to improve the environment has had a few interesting consequences for environmental investors. The first is that there are now many more companies in which environmental investors can invest. According to New Energy Finance, between 1992 and 2002, there were 30 IPOs of alternative energy-related companies raising $2 billion; in 2003-2004, 29 IPOs raised $7 billion; in 2005-2006, 92 IPOs raised $13 billion; and in 2007 alone, 61 IPOs raised $17 billion.

As the universe of companies providing environmental solutions has swelled, so has the universe of investors investing in them. A variety of funds are now investing in alternative energy, including exchange-traded funds (ETFs) that invest in alternative energy indices, actively managed mutual funds, and a myriad of private equity funds, many launched in the past two years.

Even more remarkable, it is now possible for investors to make money by investing in these new technologies, which historically has not always been true. For example, the New Alternatives Fund has been focused on investing in alternative energy since 1996, longer than any of the widely tracked alternative energy indices. Between 1996 and 2004, the fund's performance was essentially flat; between 2005 and 2007, the fund's shares approximately doubled in value. Many of the indices and other funds investing in alternative energy have shown similar strong performance since 2005.

Using Their Power

Many environmental investors are not shy about letting the companies in which they invest know what is on their minds. The main tool that all investors use to analyze potential investments is disclosure of information by companies. While financial information disclosure is carefully monitored by national and international regulatory bodies, disclosure of environmental information is still largely voluntary.

Groups of like-minded investors frequently join together in requests for this type of information. For example, the Carbon Disclosure Project, representing a group of investors managing $41 trillion, annually asks global corporate leaders to present their greenhouse gas emissions in a standard, comparable format. And in the United States, the Social Investment Research

Analyst Network has published a statement representing firms managing $435 billion, including Winslow Management Company, calling on corporations to publish environmental and social sustainability data according to a standard set of reporting guidelines from the Global Reporting Initiative, the producer of the most widely recognized framework for sustainability reporting.

In addition to asking companies to do things, investors can also tell them to do things by filing proxy resolutions to be voted on at companies' annual meetings. Although the results of these proxy votes are nonbinding, meaning company management can ignore them, large votes can send a powerful signal to management. The Interfaith Center on Corporate Responsibility reports that as of January 2008, it had collected data on resolutions filed with more than 60 companies traded on U.S. stock exchanges for their 2008 annual meetings. The most common requests in these resolutions called for preparation of a sustainability report, reduction of greenhouse gas emissions, and the use of sustainably grown and harvested wood and paper products.

The Demand for Green Investing

Gone are the days when environmental issues were the concerns of only students and activists. It is no longer unusual to hear the terms "emission reductions" or "pollution prevention" from investment committees or the boards of companies in which they invest.

Led by environmentally mission-oriented investors, now even mainstream investors are beginning to recognize the value of environmental information and protection. At ExxonMobil's 2007 annual meeting, for example, a shareholder-sponsored proxy resolution calling for specific greenhouse gas reduction targets garnered more than 30 percent of the votes, demonstrating the broad array of investors that are now concerned with this issue.

As the world's governments begin to negotiate a climate treaty for 2012 and beyond, the need and demand for both environmental responsibility and protection from companies will only continue to grow, and so will investor attention. ■

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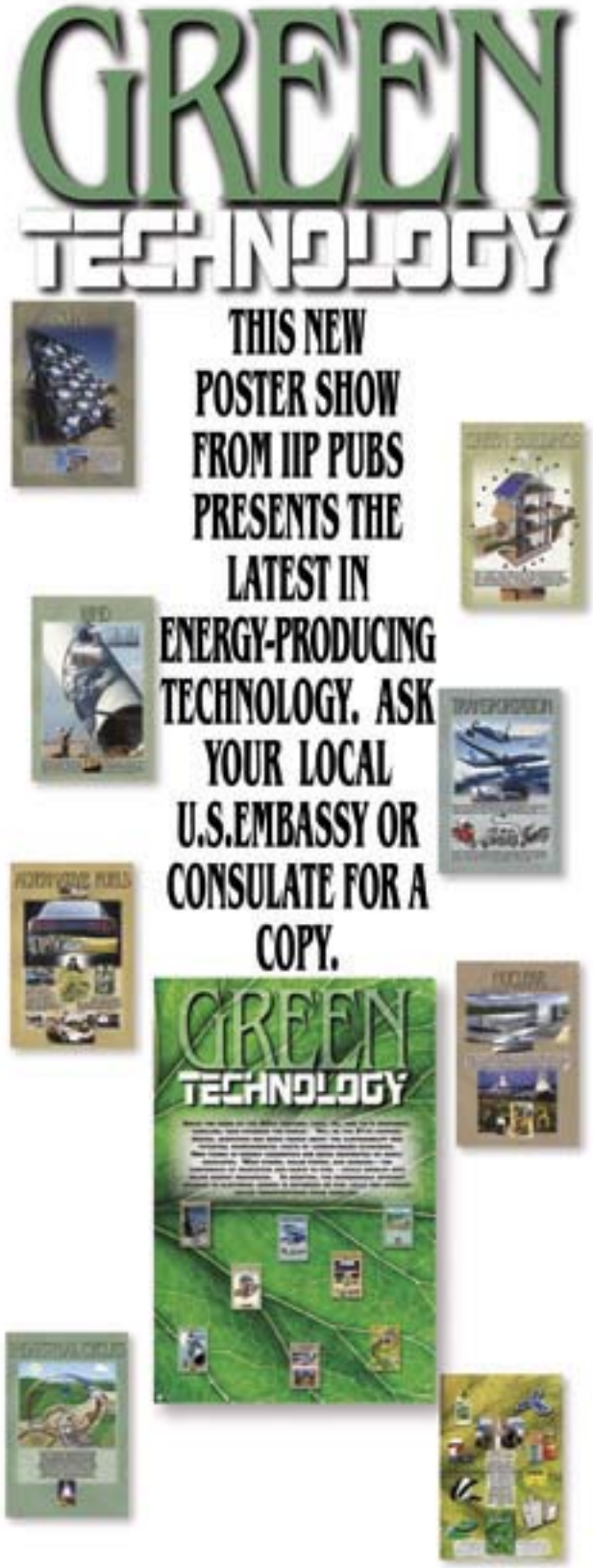


Sustainability Within the Supply Chain

Patrick C. Penfield

The focus for most companies today is the development of a sustainable supply chain — one that is robust enough to support itself and actually improve the environment.

Patrick C. Penfield is assistant professor of supply chain practice at the Whitman School of Management at Syracuse University in Syracuse, New York.

We are living in a dynamic time period and one of unprecedented growth throughout the world. Commerce between countries is increasing at exponential rates. At the same time, the world's resources are being depleted and used faster than ever before, and raw materials are becoming costlier and scarcer. Many companies are struggling with expenses while trying to increase profits.

The focus for most companies today is developing a "sustainable" supply chain — one that is robust enough to support itself and actually improve the environment.

Every company in the world has a supply chain. A supply chain is simply:

One example of a supply chain would be a car manufacturer that takes steel and other components (inputs), assembles them with labor and machines (transformation), and produces a car (output). An example of a supply chain within a service environment would be a package delivery service that takes in packages (input), stores and puts the packages en route for delivery (transformation), and then delivers the packages to the recipients (output).

The supply chain generally costs a company money, and this is why companies are so focused on sustainability. The truth is, with the increasing costs of raw material and energy, it now makes sense for companies to embrace sustainability. The return on investment is now feasible for companies so that they can employ processes that use less energy and material.

Reducing Costs and Eliminating Waste

Over the past year, I have been developing a model called the Sustainable Green Supply Chain. Many companies are moving in this direction, and supply chains will evolve in this area. Ideally, the goal of the supply chain model is to be environmentally friendly with the material and processes being used and to eliminate any waste within the supply chain in order to become as sustainable as possible.

By moving toward a sustainable green supply chain, companies will uncover new opportunities to reduce costs.

Another focus for many companies will be "entire" system thinking versus "component-level" thinking. Component-level thinking — a mindset that many companies are still employing — is the concept of getting the lowest price on a component and disregarding the costs to the system generated by this component. Many times, component-level thinking is employed because it's a goal or objective determined by a company or organization. If you look at the overall costs being produced by a component, however, it may become obvious that it would have made sense to spend more money up front on a more expensive component that reduces the entire system cost.

As Paul Hawken, Amory Lovins, and L. Hunter Lovins tell us in their book *Natural Capitalism*: "Single components are usually considered in isolation. Designing a window without the building, a light without the room, or a motor without the machine it drives works as badly as designing a pelican without the fish. Optimizing components in isolation tends to pessimize the whole system and hence the bottom line." Many companies struggle with this issue because they do not effectively measure the cost of each component within the entire system.

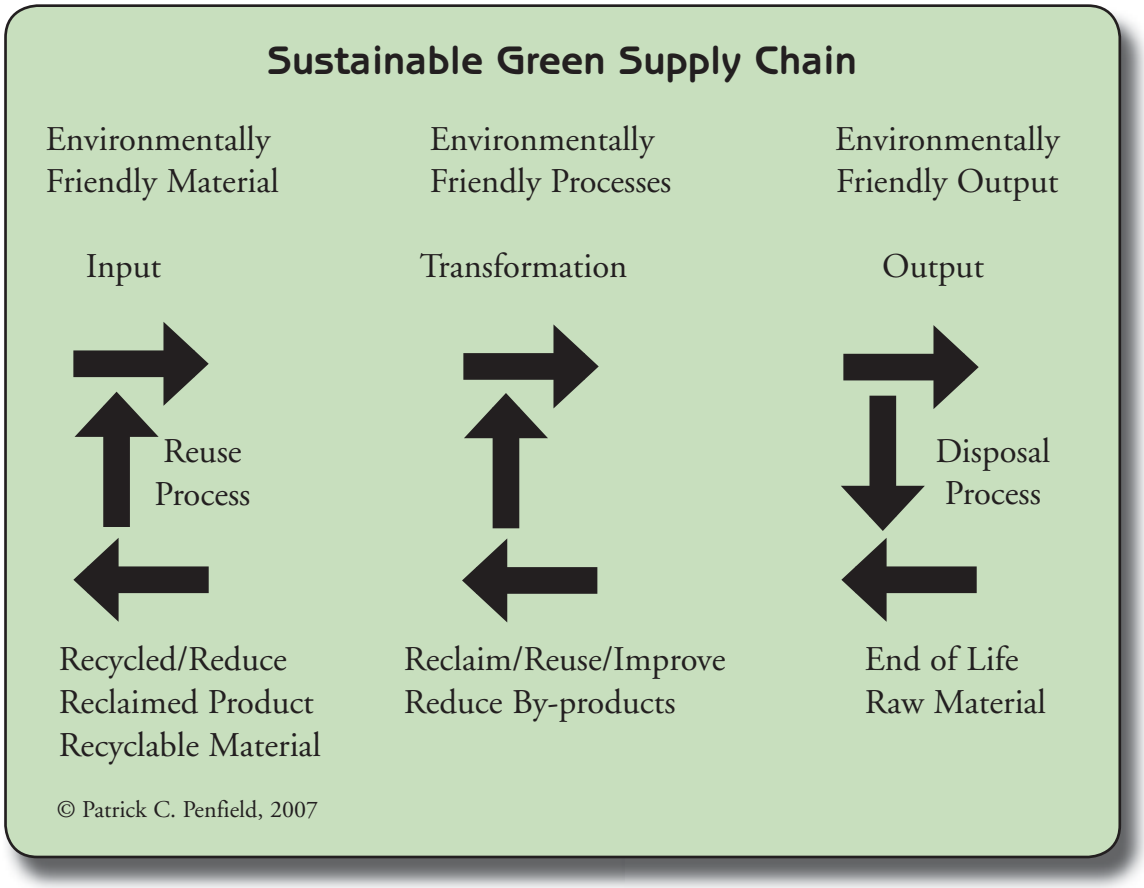
Some companies are employing a two-pronged approach to "green" their processes. One aspect is to move existing processes to the sustainable green supply chain model, and the other is to take new processes and design them for sustainability. The U.S. global conglomerate 3M has a program called Pollution Prevention Pays (3P). The company's policy, as described by Daniel Esty and Andrew Winston in their book *Green to Gold*, is that "anything not in a product is considered a cost. As 3M execs see it, everything coming out of a plant is either product, by-product (which can be reused or sold), or waste. Why, they ask, should there be any waste?" This is a policy that every company needs to start emulating.

Energy Costs and Conservation

The major focus for many companies regarding the supply chain these days is energy. With oil trading at more than $100 per barrel, companies are having difficulties absorbing this cost. The emphasis for most companies is figuring out how to use less energy or coming up with an alternative energy option to offset the increased expense. In the United States, ethanol, biomass, fuel cells, wind, solar, nuclear, and other various energy options are being evaluated by companies.

The other big energy initiative is conservation. Retail giant Wal-Mart has become a major sustainability player. This company has dedicated space on its Web site *[http://walmartstores.com/]* showcasing what it is doing to help the environment. The focus has been on reducing the amount of fuel used by their trucks and stores by using alternative energy and conservation.

As stated on the Wal-Mart Web site: "We have a goal to be supplied by 100 percent renewable energy, to create zero waste, and to sell products that sustain our resources and environment." Wal-Mart is using compact fluorescent bulbs in many of its stores, employing hydrogen fuel cells for its lift trucks, placing doors on refrigeration units, replacing fluorescent lighting with LED (light-emitting diode) lighting, and conserving the power used when trucks in its fleet are idling. Wal-Mart's expectation is that the company will save millions of dollars by being sustainable.



© AP Images/Paul Sakuma

AMD has modified a wet processing tool to use fewer chemicals and less water to clean silicon wafers.

Other companies also have focused on sustainability and reduced their costs. According to Esty and Winston, chipmaker AMD modified a "wet processing" tool to use fewer chemicals and, ironically, less water to clean silicon wafers. The process, which once used 18 gallons of water per minute, now uses fewer than six. Shoe manufacturer Timberland redesigned its shoe boxes to eliminate 15 percent of the material used in them — a dramatic savings when you ship more than 25 million pairs of shoes per year.

A Look to the Future

The big advantages for companies in becoming sustainable are reducing costs and helping the environment. In the United States, there are many pieces of environmental legislation in Congress waiting to be approved. In the meantime, companies are being proactive and focusing on sustainability. Many citizens throughout the world are demanding environmentally friendly products.

In the coming years, we can expect to see more stringent environmental standards for all companies. The future of sustainability looks green! ■

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Point/Counterpoint: The Role of Government

As the other articles in this issue make clear, U.S. corporations are venturing into more environmentally sustainable ways of doing business for a variety of reasons. Traditionally, however, in many countries, government regulations have been a driving force in environmental cleanup. What is the appropriate role for government in encouraging business to go green?

We asked two experts for their views on this issue. Margo Thorning is senior vice president and chief economist with the American Council for Capital Formation in Washington, D.C. She has a Ph.D. in economics from the University of Georgia, and has served with the U.S. Department of Energy, the U.S. Department of Commerce, and the Federal Trade Commission. The council's mission is to promote economic growth through sound tax, trade, regulatory, and environmental policies.

Bob Willard is an expert on the business value of corporate sustainability strategies. The author of The Sustainability Advantage *and* The Next Sustainability Wave, *he has a Ph.D. from the University of Toronto. Willard applies business and leadership development experience from his 34-year career at IBM Canada to engage the business community in avoiding the risks and capturing the opportunities associated with sustainability issues.*

Much of their discussion focuses on the problem of reducing greenhouse gas emissions. We welcome comments on this topic from our readers for future publication online. Please send your comments on this topic to eJournalUSA@state.gov. The limit is 200 words in English. Please identify your country in signing your comment.

Government Leadership in the Quest for Sustainability

Bob Willard

The 2007 Intergovernmental Panel on Climate Change report says that we have only a few years in which to stabilize our greenhouse gases before we experience irreversible and precipitous climate change. The Millennium Ecosystem Assessment says that 60 percent of the 24 ecosystems on which we depend are being degraded or used unsustainably, and the rest are in jeopardy. According to the Global Footprint Network, humanity's ecological footprint is already 23 percent larger than what the planet can sustain, and the overshoot is growing. The United Nations Environment Program Global Environment Outlook (GEO-4) says that major persistent threats to the planet — such as climate change, the rate of

Greening Business Investment: How About a Carrot?

Margo Thorning

Reducing the growth of U.S. greenhouse gas emissions, a central environmental issue, while promoting economic growth are important goals for policy makers all over the world. The U.S. business sector is, for the most part, on board with the idea that companies should do their share to slow the growth of U.S. greenhouse gas emissions (GHGs). In 2002, the Bush administration committed the United States to reducing GHG intensity (the amount of energy needed to produce a dollar of GDP) by 18 percent between 2002 and 2012, and the United States is on track to exceed that target.

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These students are participating in a nationwide simultaneous tree-planting program on a 3,000-kilometer stretch of the Pan Philippine Highway. The program was sponsored by the Philippine government's Environment and Natural Resources Department.

extinction of species, and the challenge of feeding a growing population — remain unresolved, and all of them put humanity at risk.

Sustainability problems teeter on the edge of tipping points. We are in a race to see if humanity can save the world that nurtures us. Happily, solutions are known and are within our capabilities. We do not have a deficiency of solutions.

But we do have a deficiency of sustained political will. We need to stop the unsustainable practices that are precipitating this planetary emergency. We need to declare a War for Sustainability to galvanize our collective resolve. We need to bring the same level of urgency and resources to the climate, energy, and ecological crises as we have to the War on Terror. Governments need to take the lead to future-proof society.

Accelerating the rate of GHG reduction will, none the less, require stronger efforts by industry, electric utilities, households, and government. Implementing a strategy that reduces the cost of capital for clean energy investments, for research and development (R&D), and for demand side management could pay high dividends in terms of stronger U.S. economic growth and reduced energy intensity — without slowing economic growth and increasing unemployment.

Impact of Mandatory Programs for GHG Reduction

Many current legislative proposals rely on a "cap and trade" approach to reducing emissions, while a few proposals call for a tax on carbon emissions. These proposals, if enacted, are likely to slow the growth of GDP and employment in the United States. As noted in a 2007 Congressional Budget Office report, *Issues in Climate Change*: "Obtaining allowances — or taking steps to cut emissions to avoid the need for such allowances — would become a cost of doing business for firms that were subject to the CO_2 cap. However, those firms would not ultimately bear most of the costs of the allowances. Instead, they would pass along most such costs to their customers (and their customers' customers) in the form of higher prices."

Many pundits think the U.S. economy is near (or possibly already in) a recession. As policy makers attempt to rally the U.S. economy during this difficult period, it may be wise to consider some "carrots" to help companies make the kind of green investments in plant and equipment and R&D that will not only reduce the growth in GHGs but also raise productivity and economic growth.

The Role of Economic Growth and Technology in GHG Reduction

Many policy makers overlook the positive impact that economic growth can have on GHG emission reductions. For example, in 2006, while the U.S. economy grew at 3.3 percent, CO_2 emissions fell by 1.3 percent. Overall, energy use declined by only 0.9 percent, indicating the U.S. economy is becoming less carbon intensive even

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Michael Mobbs, a consultant on eco-friendly housing developments and office projects, shown here outside his self-sufficient house in Sydney, Australia, says that government regulations are a major hurdle to encouraging more green construction.

Here are seven bold actions that address the monumental environmental and social challenges we face.

1. Integrate Education for Sustainable Development throughout the formal, non-formal, and informal education systems: Governments at all levels must implement a whole-system approach to education policies, teacher training, facilities operations, and curriculum. The goal of the United Nations Decade of Education for Sustainable Development, 2005-2014, is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning throughout the world.

Such education improves the mindsets of

without mandatory emission caps.

Technology development and deployment offer the most efficient way to reduce GHG emissions, and a strong economy tends to pull through capital investment faster. There are only two ways to reduce CO_2 emissions from fossil fuel use: use less fossil fuel or develop technologies to use energy more efficiently to capture emissions or to substitute for fossil energy. There is an abundance of economic literature demonstrating the relationship between energy use and economic growth, as well as the negative impacts of curtailing energy use. Over the long term, new technologies offer the most promise for affecting GHG emission rates and atmospheric concentration levels.

Providing better tax treatment for R&D in the United States would be a positive step; for example, making the R&D tax credit permanent would encourage sustained longer-term programs that could lead to technological breakthroughs.

The Role of International Partnerships

Research by David Montgomery and Sugandha Tuladhar of CRA International makes the case that agreements such as the Asia-Pacific Partnership on Clean Development and Climate (AP6), an agreement signed in 2005 by India, China, South Korea, Japan, Australia, and the United States, offers an approach to climate change policy that can reconcile the objectives of economic growth and environmental improvement for developing countries. Together, the AP6 partners have 45 percent of the world's population and emit 50 percent of man-made CO_2 emissions. The projections of very strong growth in greenhouse gases in developing countries over the next 20 years mean that there is enormous potential for reducing emissions through market-based mechanisms for technology transfer.

Montgomery and Tuladhar note that there are several critical factors for ensuring the success of an international agreement that relies strongly on private-sector investment for success. Their research shows that institutional reform is a critical issue for the AP6, because the lack of a market-oriented investment climate is a principal obstacle to

children and adults about the personal relevance of sustainability, the dangers of climate change and other social and environmental crises, and the urgent need for action. An informed population gives governments their mandates for change.

2. Replace the GDP with the GPI: The Genuine Progress Indicator (GPI) integrates health care, safety, a clean environment, and other indicators of well-being with the gross domestic product's (GDP) financial and economic metrics to form a more holistic assessment of national progress. Government endorsement of this annual report on the genuine wealth of a country would legitimize value other than money. Having such an assessment of the national carbon or ecological footprint would awaken people to the need for urgent action on climate change.

3. Implement ecological tax shifting: Much of our tax system is upside down: We are taxing "goods" and incenting "bads." Instead, we should tax pollution, carbon, and waste. We should incent employment, renewables, capital stock retrofits, responsible consumption, and energy efficiency. Revenue-neutral shifting of the tax burden from things we don't want to things we do want will send strong behavioral change signals.

4. Eliminate "perverse subsidies": Today, alternative energy options are discouraged by perverse subsidies to the nuclear and fossil fuel industries. Industrial countries annually subsidize the fossil fuel industry with more than $200 billion. In 2005, between $29 billion and $46 billion of that went to the U.S. fossil fuel industry alone. These are perverse subsidies because they underwrite environmentally destructive behavior. Citizens are billed twice for them — once when their taxes pay for the subsidies, and again when they bear the direct and indirect costs of environmental restoration and health care.

As with ecological tax shifting, subsidies should be shifted from the fossil fuel and nuclear industries to clean-technology industries.

5. Impose carbon caps/carbon taxes: An effective carbon-price signal could realize significant climate change mitigation potential in all sectors. Most assessments suggest that high carbon prices reducing greenhouse gas emissions in China, India, and other Asian economies. China and India have both started the process of creating market-based economic systems, with clear benefits in the form of increased rates of economic growth. But the reform process has been slow and halting, leaving in place substantial institutional barriers to technological change, productivity growth, and improvements in emissions. The World Bank and other institutions have carried out extensive investigations about the role of specific institutions in creating a positive investment climate. These include minimizing corruption and regulatory burdens, establishing an effective rule of law, recognizing intellectual property rights, reducing the role of government in the economy, removing energy price distortions, and providing an adequate infrastructure and an educated and motivated labor force.

The Importance of Technology Transfer for Emission Reductions

As described above, technology is critically important because emissions per dollar of income are far larger in developing countries than in the United States and other industrial countries. This is both a challenge and an opportunity. It is a challenge because it is the high emissions intensity — and relatively slow or nonexistent improvement in emissions intensity — that is behind the high rate of growth in developing country emissions.

Opportunities exist because the technology of energy use in developing countries embodies far higher emissions per dollar of output than does technology used in the United States; this is true of new investment in countries such as China and India, as well as their installed base. The technology embodied in the installed base of capital equipment in China, for example, produces emissions at about four times the rate of technology in use in the United States. China's emissions intensity is improving rapidly, but even so its new investment embodies technology with twice the emissions intensity of new investment in the United States.

(20 to 50 US$/t$CO_2$-eq), sustained or increased over decades, could lead to a power generation sector with low-GHG (greenhouse gas) emissions by 2050 and make many mitigation options in the end-use sectors economically attractive. Therefore, governments should cap carbon emissions by company, with auctioned permits, and/or impose a carbon tax.

The Earth Atmospheric Trust proposes that governments cap global emissions, auction the pollution permits, and return dividends equally to every citizen on Earth to help reduce poverty. Another report, Option 13, also proposes a global carbon tax. Both are good ideas.

Further, governments should place a moratorium on new coal-fired plants and oils sands expansion until carbon capture and storage technologies are proven.

6. Lead by example: We need public sector leadership through government purchasing to expand demand for "green" products from "green" suppliers. Governments must lead by example by purchasing only appliances meeting rigorous energy-efficiency standards, advanced electric and hybrid vehicles with more powerful and reliable batteries, eco-friendly cleaning products, Forest Stewardship Council-certified paper with 100 percent post-consumer recycled fiber, and similar green products and services. All government buildings should be LEED (Leadership in Energy and Environmental Design) gold equivalent or higher, earning governments the right to change building codes and to demand the same standard for residential, commercial, and industrial buildings.

7. Work to alleviate poverty: Since many sustainability challenges stem from the desperate efforts by the poor in developed and developing countries who are trying to survive or improve their situation, concerted action by governments around the world to improve their living conditions could contribute to improving the environment.

Strategies for Promoting Institutional Change

Although it is clear that there is a relationship between institutions, economic growth, and greenhouse gas emissions, there is no general formula that can be applied to identify the specific institutional failures responsible for high emissions per unit of output in a specific country. If there is to be progress on institutional reform, at a minimum the key actors or stakeholders — concerned businesses; other groups with influence on opinion and policy in China, India, and other developing countries (including local and regional governments); and national governments — must agree on the nature and scope of the problems and on reforms required to address the problems and identify concrete actions that each government will take to bring about institutional reforms.

For example, making progress on implementing the AP6 can be accelerated if the governments of Australia, Japan, and the United States would fund research on topics such as the investment climate; the level of technology embodied in new investment; the role of foreign direct investment and potential energy savings from technology transfer; and the nature and impacts of pricing distortions on energy supply, demand, and greenhouse gas emissions in China and India. Government support for research to make clear the direct consequences of proposed reforms for energy efficiency and the benefits of a market-based investment climate for the overall process of economic growth would also be helpful.

Broadening the International Partnership to Include all Major Emitters

At the G-8 Summit in Germany last year, policy makers agreed to take a series of steps toward GHG reductions. Recognizing that 85 percent of all emissions come from about 15 countries, G-8 leaders agreed to convene the major energy-consuming countries to agree on a new international framework by the end of 2008. The leaders agreed to work toward a long-term global goal for reducing GHGs and to accelerate the development and deployment of clean-energy

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The U.S. Environmental Protection Agency (EPA) encourages green building by its certification of energy-efficient construction. This house in Monroe, Michigan, is an EPA-certified five-star energy home.

A Summing Up

These seven bold strokes are guided by a compelling government vision of a better quality of life for all citizens. Rather than just preventing pollution, progress toward sustainability requires the systemic integration of environmental, social, and economic considerations in decision making at all levels in society.

Governments need to deploy a much more comprehensive set of policies to bolster efficiencies and productivity, reduce resource use, prevent pollution, and mobilize citizens. Governments have an important leadership role to ensure that market forces send signals that encourage sustainable corporate, institutional, and individual behavior, and punish the opposites.

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technologies. They also agreed to work toward the reduction and/or elimination of tariff and nontariff barriers to environmental goods and services through the WTO Doha negotiations. Other points of agreement included developing and implementing national energy-efficiency programs and advancing international energy-efficiency cooperation, as well as pursuing joint efforts in key sectors such as sustainable forestry, power generation, transportation, industry, and buildings. Finally, they agreed to enhance cooperation with developing countries to adapt to climate change.

In Conclusion

To be effective, policies to reduce global GHG emission growth must include both developed and developing countries. Polices that enhance technology development and transfer are likely to be more widely accepted than those that require sharp, near-term reductions in per capita energy use. Extending the framework of the Asia-Pacific Partnership on Clean Development and Climate to other major emitters will allow developed countries to focus their efforts where they will get the largest return, in terms of emission reductions, for the least cost.

Finally, if the United States does adopt a mandatory greenhouse gas emissions reduction program, serious consideration should be given to implementing a carbon tax rather than an EU-style cap and trade system. A key component of any mandatory U.S. program should be allowing emissions to increase as both economic growth and U.S. population increase.

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Internet Resources

Online sources for information about green corporations

American Council for an Energy-Efficient Economy
A nonprofit organization dedicated to advancing energy efficiency as a means of promoting economic prosperity and environmental protection.
http://www.aceee.org/

Clean Edge
Helps companies, investors, and governments understand and profit from clean technologies.
http://www.cleanedge.com/

CFO.com — Corporations and the Environment
A special issue of the online journal *CFO.com* with articles on sustainability and green buildings.
http://www.cfo.com/guides/guide.cfm/3214842?f=insidecfo

Eco-Patent Commons
An initiative of the World Business Council for Sustainable Development to create a collection of patents on technology that protects the environment.
http://www.wbcsd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=MTQ3NQ&doOpen=1&ClickMenu=LeftMenu

GreenBiz.com
An information clearinghouse on sustainable business practices.
http://www.greenbiz.com/

GreenBiz.com — State of Green Business 2008
A report on the quest of corporations and businesses to become greener and more environmentally responsible. The GreenBiz Index, a set of 20 indicators of progress, tracks the resource use, emissions, and business practices of U.S. companies.
http://www.stateofgreenbusiness.com/

GreenBiz Leaders
Provides examples of how companies of all sizes and sectors align environmental responsibility with business success.
http://www.greenbizleaders.com/

Green Energy
News stories from the *San Jose Mercury News* about companies that are exploring new green technologies.
http://www.mercurynews.com/greenenergy

Green Power Partnership
A program of the U.S. Environmental Protection Agency that provides information to companies about consuming energy from green sources to help reduce the environmental impacts of electricity use and support the development of renewable-generation capacity.
http://www.epa.gov/greenpower/toplists/fortune500.htm

MSNBC — Going Green
A collection of online articles about green technologies and their use.
http://www.msnbc.msn.com/id/17950339/

The Source for Renewable Energy
An online buyer's guide and business directory to more than 12,000 renewable energy businesses and organizations worldwide.
http://energy.sourceguides.com/index.shtml.

U.S. Business Council for Sustainable Development
A nonprofit association of businesses whose purpose is to deliver collaborative projects that help its members and partners demonstrate leadership in the United States on sustainable development and realize business value.
http://www.usbcsd.org/

U.S. Green Building Council
A nonprofit corporation dedicated to sustainable building design and construction.
http://www.usgbc.org/

World Business Council for Sustainable Development
A CEO-led global association of some 200 companies dealing with business and sustainable development.
http://www.wbcsd.org/

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Report on a poll that found overwhelming acceptance by businesses of responsibility for more than making profits.
www.mckinseyquarterly.com/article_page.aspx?L2=39&L3=29&ar=1741&pagenum=1

National Public Radio — How Environmentalists Shaped TXU Deal
An interview with Fred Krupp, president of Environmental Defense, about winning environmental commitments from suitors of a Texas electric utility.
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A biennial report that surveys investors who care about more than the bottom line.
www.socialinvest.org/pdf/research/Trends/2005%20Trends%20Report.pdf

U.S. Climate Action Partnership — A Call for Action
Recommendations from the U.S. Climate Action Partnership, a coalition of major corporations and environmental groups working for national legislation in the United States to slow, stop, and reverse the growth of greenhouse gas.
http://www.us-cap.org/ClimateReport.pdf

Filmography

Green: The New Red, White and Blue
http://www.imdb.com/title/tt1024204/
Director: David Hickman
Running time: 90 minutes
Synopsis: *New York Times* columnist Thomas L. Friedman looks at various "green" technologies being adopted by American businesses to reduce the output of the greenhouse gas carbon dioxide and ultimately to reduce global warming and ensure political stability throughout the world.

Green Is the Color of Money
http://www.imdb.com/title/tt1054598/
Director: Ben Shedd
Running time: 33 minutes
Synopsis: Widescreen documentary about designing and building one of the world's most energy-efficient, high-performance buildings, the Banner Bank Building in Boise, Idaho. Built for standard costs using standard parts put together in an integrated way, this 11-story building shows that building green is good business and good for the environment.

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