

CLIMATE CHANGE 101

Business Solutions



The response of business leaders to the problem of climate change is undergoing a major transformation. Even ten years ago, the corporate sector was almost uniformly opposed to serious government action on the issue. But increasing certainty about the science of climate change—and an ever greater understanding of the risks and opportunities it presents for businesses and society—have contributed to a new willingness among corporate leaders to help shape solutions. In addition to acting on their own to reduce greenhouse gas emissions, a growing number of businesses are calling for government action to protect the climate.

ASSESSING THE RISKS

For corporate leaders responsible for paying attention to the full range of risks confronting their businesses, climate change has become a risk that can no longer be ignored. As the CEO of Marsh, the world's largest risk management services company, put it in a February 2006 conference call to which he invited the firm's 30,000 corporate clients worldwide: "Climate change is probably one of the best examples of where long-term risk planning is essential to mitigate some potentially irreversible long-term effects."¹

Insurance companies have played an important part in drawing attention to the risk of economic losses from climate change. According to the global insurance giant, Allianz, climate change is increasing the potential for property damage

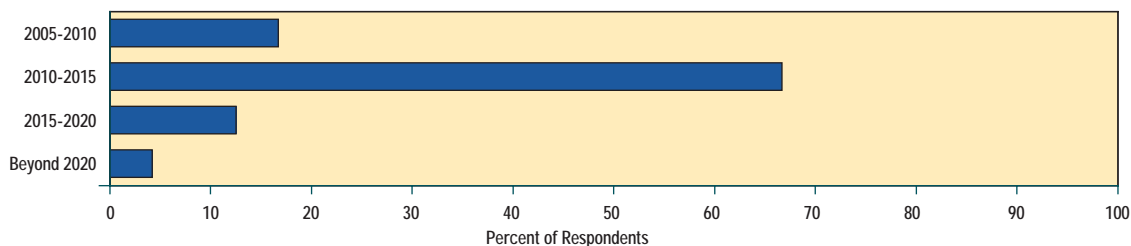
at a rate of between 2 and 4 percent every year. The U.S. insurance company AIG has warned, "Climate change is increasingly recognized as an ongoing, significant global environmental problem with potential risks to the global economy and ecology, and to human health and well-being."²

Regulation Viewed as Inevitable. One of the largest and most immediate risks businesses face from climate change is what experts refer to as "regulatory risk"—or the risk to companies posed by government limits on greenhouse gas (GHG) emissions. Nearly all business leaders surveyed for the Pew Center's recent report, *Getting Ahead of the Curve: Corporate Strategies That Address Climate Change*,³ view national greenhouse gas regulations as inevitable in the United States. Of these, 84 percent believe new standards will take effect before 2015; 17 percent say they believe regulation will take effect before 2010 (see Figure 1).

Figure 1

Anticipated Date of Federal Standards on Climate Change

[If you believe that federal standards on climate change are imminent] when do you believe these standards will take effect?



Source: *Getting Ahead of the Curve: Corporate Strategies That Address Climate Change*, Pew Center on Global Climate Change.



The effect of these limits on business operating costs and the value of company assets will be significant, especially for firms producing high levels of emissions. As a result, many companies are starting to reduce their emissions voluntarily now. Their motivations include gaining a head start over competitors in learning what climate strategies work, preparing to respond rapidly once regulations do take effect, and better managing the costs of reducing their emissions over time. In addition, many companies recognize that acting early to reduce emissions is an important way to gain credibility and influence among lawmakers as they consider what policies will work best.

Threats to Competitiveness. Government climate policies and growing customer awareness about the climate problem are combining with other forces to produce significant changes in the markets for products ranging from cars and trucks to electricity. For companies to remain competitive, they will need to position themselves to succeed in the face of two trends: a decline in the value of inefficient and greenhouse gas intensive technologies; and a corresponding increase in demand for climate-friendly technologies and services.

For example, electric utilities that invest in high-emission power plants today may be at a competitive disadvantage in later years when governments impose limits on carbon emissions. Car companies that produce mainly gas guzzlers already are losing market share to competitors that produce higher numbers of efficient hybrid and diesel models.

Yet, the lack of a coherent climate change policy (and related energy policies) means that U.S. companies don't have a clear sense of the competitive stakes or the true costs of continuing with business-as-usual.

Physical Risks to Business. Businesses also face risks from the projected impacts of climate change, including stronger hurricanes, increased drought, sea level rise, flooding and other natural catastrophes. The industries most likely to be affected directly by the physical risks of climate change include agriculture, forestry and paper products, tourism, real estate, offshore energy development, and insurance.⁴ For other industries, as well as companies located far away from regions facing direct climate impacts, the indirect effects can be substantial. As the United States saw following Hurricane

Businesses Face Growing Pressures for Climate Disclosure

An increasing number of investors are realizing that climate change could affect the value of their investments. As a result, they are pressing companies to disclose climate-related risks and corporate climate strategies. For example:

- During the 2006 proxy season, investors filed more than two dozen climate-related shareholder resolutions, many of them seeking greater analysis and disclosure of business impacts of climate change and future regulation of greenhouse gas emissions.⁵ Over the past two years, climate change has emerged as the leading focus of non-financial shareholder resolutions.⁶
- The Carbon Disclosure Project (CDP) was launched in 2003 to enable institutional investors to collectively sign a single global request to companies for disclosure of their greenhouse gas emissions and climate strategies. The latest CDP disclosure request issued in 2006 went out under the signatures of 225 institutional investors with combined assets of \$31.5 trillion; 3.3 billion tons of emissions were reported. This is a significant increase over 2003, when 1.8 billion tons of greenhouse gas emissions were reported by 35 participating investors with \$4.5 trillion under management.

Katrina, the loss of oil and gas platforms in the Gulf of Mexico not only pushed up gasoline prices but also hurt profits in other industries, including chemical companies and fertilizer manufacturers that use fossil fuels as ingredients in their own products. Damages to highways and port facilities in Louisiana and Mississippi slowed the shipment of goods to companies in a host of other industries hundreds of miles away.

Other Risks. Businesses face other risks from climate change. For example, some investors and analysts believe that the federal Sarbanes-Oxley law, by requiring disclosure of financially "material" risks, should force some industries to disclose whether (and how) climate change and carbon policy

will affect future earnings. If courts agree, company directors and officers could be held criminally liable for failures to disclose climate risks. There may also be considerable risk to a company's brand and reputation if customers, partners, investors and/or employees view the firm as irresponsible with regard to climate change.

CAPTURING THE OPPORTUNITIES

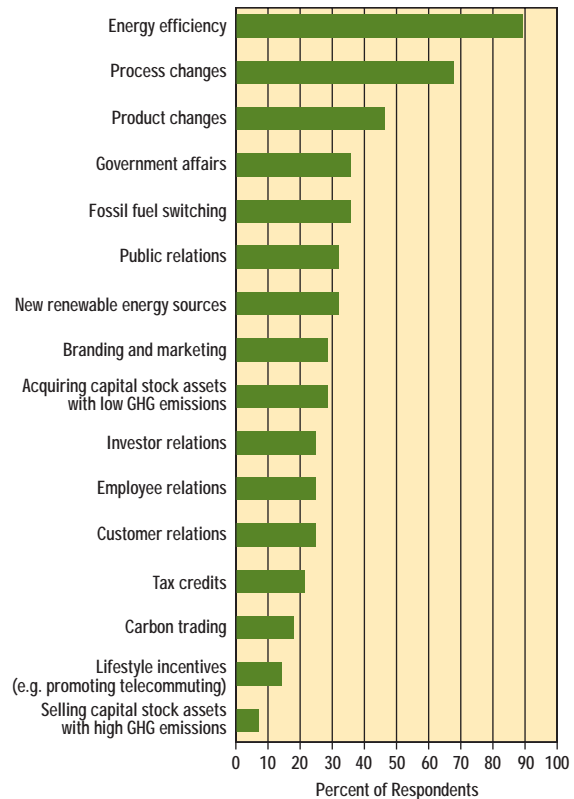
Although there will be significant costs associated with achieving the deep long-term emission reductions essential to protect the climate, the experience of companies that have led in reducing emissions ahead of regulatory requirements proves there are numerous options for reducing GHGs that decrease costs and increase profits. Figure 2 shows a ranking of programs that benefit the bottom line by major corporations the Pew Center on Global Climate Change polled in Fall 2005. Also, policies that give businesses the flexibility to respond innovatively will minimize costs.

Among the leading companies on climate issues, there is a major shift underway from corporate climate strategies that focus on risk management and emissions reductions toward strategies for developing and marketing new climate-friendly products and services. In a carbon-constrained future, the market will demand a wide range of low-GHG technologies, especially in the electricity, buildings and transportation sectors. Table 2 spotlights key areas of opportunity, including clean energy generation, energy-efficient equipment and materials, and low-emission vehicles. (These technologies and their contribution to global emissions reductions are discussed in *Climate Change 101: Technological Solutions*).

Each technology area represents enormous potential annual revenue for the companies and countries that succeed as major producers. According to an August 2006 *Business Week* article, even given modest assumptions about increasing demand for clean technologies, there is tremendous potential for new revenue growth.⁷ For example, if the United States increases the percentage of the nation's power delivered by renewables from 2.5% to 3.4% by 2010, clean power producers will see up to \$10 billion in new revenues. In the longer run, new technologies and new market drivers could increase cleantech revenues by orders of magnitude.⁸ Key suppliers of components for these new technologies—for

Figure 2

Ranking of Climate-Related Programs That Increase Companies' Profits



Source: Based on findings of survey in *Getting Ahead of the Curve: Corporate Strategies That Address Climate Change*, Pew Center on Global Climate Change, 2006

example, manufacturers such as Eaton and Parker-Hannifin whose hydraulics and electrical systems can enable hybrid vehicles and wind turbines—also stand to tap major new sales opportunities as well.

As investors focus on the risks of climate change, they also are taking note of opportunities to earn high returns from investments in climate-friendly businesses:

- Venture capital investing in so-called “cleantech” industries—which include firms developing environmentally friendly technologies in the energy, agriculture, information technology, transportation and other sectors—has surged in recent years. Within cleantech, climate-related

energy investments are by far the largest segment (see Figure 3). During 2005, cleantech investing totaled \$1.6 billion, a 43-percent jump from the previous year, and investment in the third quarter of 2006 topped \$900 million—an increase of almost 300 percent over the third quarter of 2004.

- In 2005, Goldman Sachs bought one of the largest wind power developers in the United States and led financing for a \$60 million fund for development of rooftop solar systems. Later that year, the firm committed up to \$1 billion more for renewable energy and energy efficiency projects.
- Public pension funds, required by law to safeguard the long-term value of government employees' retirement savings, are investing significant amounts in alternative energy businesses. For example, the California Public Employees Retirement System (CalPERS), the largest public pension fund in the United States, and the California State Teachers Retirement System (CalSTRS) together are dedicating more than \$500 million to seed alternative energy businesses through their Green Wave Initiative.
- A recent study by Ceres⁹ found that dozens of new insurance products are emerging to tackle climate change and resulting weather losses. For example, Firemen's Fund Insurance is launching a first-of-its-kind "green" cover-

age, including rate credits and other incentives, for commercial building owners who rebuild damaged properties using green and LEED-certified (Leadership in Energy and Environmental Design) building practices.

Businesses in energy, technology and other sectors also are making substantial new investments of capital and effort to expand their climate-friendly business. GE, for example, has committed to doubling its investment in environmental technologies to \$1.5 billion by 2010.¹⁰ Over the next 10 years, BP will invest \$8 billion in solar, wind, hydrogen and efficiency-enhancing "combined cycle" power generation.¹¹ ("Business Actions on Climate" on page 5 outlines other examples of leading companies transforming their businesses to succeed in a carbon-constrained world.) It is important to note that the absence of clear climate policy in the United States has meant that the scale of overall U.S. investment in climate-friendly technologies is not keeping up with the magnitude of the challenge or with investment in Europe. While private funding from investors and corporations can help the United States compete in some of these technology markets, the U.S. cannot compete in other areas without greater government support for research, development, and deployment. The solar power market provides a clear historical example. In 1996, U.S. manufacturers had 44% of market share worldwide, but that has slipped to 9% in 2005—lost mostly to

Table 1. Example Business Growth Opportunities for Climate Friendly Technologies

Technology Type	Illustrations of Size and Type of Market Opportunities
Efficient vehicles	Billions of new drive train components, millions of tons of lightweight body materials, advanced electronics, etc.
Efficient buildings	Billions of efficient appliances, millions of high efficiency heating and ventilation systems, advanced systems controls, etc.
Low-carbon coal power	Hundreds of new plants worldwide—each requiring thousands of specialty components, advanced materials, etc.
Geologic storage of CO ₂	Hundreds of underground reservoirs—drilling services, injection well equipment, monitoring equipment, etc.
Wind power	Millions of windmills—revenue for landowners, hundreds of tons of advanced materials, billions of bearing components, etc.
Solar power	Tens of millions of solar panels, tons of advanced materials, control systems, new revenue source for buildings, etc.
Biofuels	Billions of tons of crop yields, major markets for advanced seed stocks and crop inputs, revenue from millions of acres of now-marginal land, thousands of biofuel plants, millions of "flex-fuel" vehicles, etc.

Business Actions on Climate

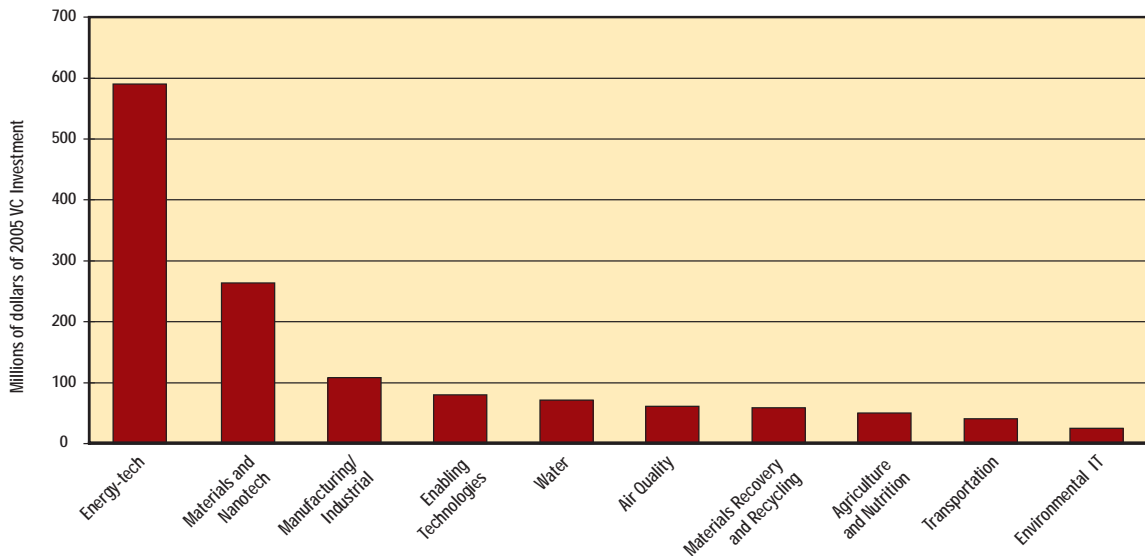
As of December 2006, 42 companies have joined the Pew Center's Business Environmental Leadership Council (BELC). These are mostly Fortune 500 companies with a combined stock market value of over \$2.4 trillion and 3 million employees. They represent most industrial sectors and many of the largest emitters of greenhouse gases, including coal-burning utilities, mining companies, aluminum producers, automobile manufacturers, pulp and paper manufacturers, chemical companies, oil and gas businesses, and the cement industry.

Thirty-two of these companies have set targets to reduce their emissions, many of them more stringent than those in the Kyoto Protocol under the U.N. Framework Convention on Climate Change. The following are some of the many actions that Council members have taken to reduce emissions, while also reducing costs below those of their competitors and building new climate-related sales growth opportunities:

- In June 2006, **Dupont** and **BP** announced a partnership to develop, market, and produce butanol, a new type of biofuel potentially superior to ethanol in terms of energy content, reduction in greenhouse gases, and ease of integration into existing fuel distribution infrastructure. Dupont projects that 60% of its business will stem from the use of biology to reduce fossil fuel use in the next few decades.¹²
- **BP** also is partnering with **GE** to build up to 15 hydrogen power plants that will generate electricity while using advanced technology to capture and store up to 90 percent of the carbon dioxide that would otherwise be emitted.
- **DTE Energy** operates 29 landfill gas recovery projects at sites across the United States. These projects recover methane, a greenhouse gas, and convert it into pipeline-quality gas for producing steam or electricity. DTE Energy landfill projects have captured an amount of methane with the same global warming potential as the annual emissions of four large coal-fired power plants.
- **Baxter's** corporate energy management group performs energy reviews of the company's manufacturing facilities, maintains energy use standards, and researches and communicates best practices in energy conservation. In 2002 alone, these efforts resulted in approximately \$4.3 million in reduced energy costs.
- From 1990 to 2002, **IBM's** energy conservation measures resulted in a savings of 12.8 billion kWh of electricity—avoiding approximately 7.8 million tons of carbon dioxide emissions and saving the company \$729 million in reduced energy costs.
- **Alcoa** has saved hundreds of millions of dollars by reducing the electricity required to produce a ton of aluminum by 7.5 percent over the last 20 years. The company also supplies strong lightweight materials to reduce energy use in the aviation and automobile sectors, and sales of these materials will grow significantly as pressure grows to reduce GHG emissions from transportation.
- **Toyota** has become a leader in developing and producing clean energy vehicles, including hybrid, electric, compressed natural gas and fuel-cell electric vehicles. The Toyota Prius, a gas-electric hybrid, became available in the United States in June 2000; as of April 2006, global sales of the Prius topped 500,000; U.S. sales reached 250,000 in May 2006.
- **United Technologies** is developing zero-emission, energy-efficient fuel cells for transportation applications. The company has deployed zero-emission fuel cell buses in Washington, DC, California, Madrid and Turin.
- Since 1990, customer energy efficiency programs at **PG&E Corporation** have cumulatively saved more than 138 million MWh of electricity, avoiding up to 80 million tons of carbon dioxide emissions. In addition, as part of the company's groundbreaking new Climate Protection Program, customers can choose to pay a small premium on their monthly bill to fund projects to reduce or offset carbon dioxide emissions.

Figure 3

U.S. Cleantech Venture Capital Investment by Segment, 2005



Source: Cleantech Venture Network

producers in Germany and other countries that have strong policies in place to accelerate solar deployment.¹³

BUSINESS SUPPORT FOR STRONGER POLICY

Scientists say that the world needs to reduce total greenhouse gas emissions by 50 to 80 percent (compared to a business-as-usual scenario) in order to stabilize atmospheric greenhouse gas concentrations and avoid “dangerous climatic change.”¹⁴ Despite the recent upsurge in private-sector involvement in the climate issue, voluntary action by selected companies and their investors is not achieving sufficient reductions to solve the problem. Goldman Sachs acknowledges this fact in its Environmental Policy Framework: “Voluntary action alone cannot solve the climate change problem.”¹⁵

Recognizing both that government action is inevitable and that policy decisions made on this issue will have substantial implications for future profits, business leaders increasingly are engaging with policymakers to help influence those decisions. Many of these business leaders favor approaches that level the playing field among companies and spread responsibility for reductions to all sectors of the economy. They favor market-based measures such as “cap-and-trade” policies that give businesses flexibility either to reduce their own

greenhouse gas emissions or to buy emissions credits from others who can reduce emissions at lower cost (thereby minimizing the overall cost of meeting national and international reduction goals).

An important reason why many corporations support a move to federal regulation is the proliferation of state policies and the prospect of complying with a patchwork of state regulations and programs. In the familiar pattern of how environmental regulation often develops in America, the states are taking the lead on the climate issue ahead of the federal government.¹⁶

Business leaders also are seeking greater certainty from the government to help guide their long-term planning. In the electricity sector, for example, companies are facing decisions about replacing existing plants and building new capacity to meet demand. Without an understanding of future regulatory requirements, it is impossible to know the bottom-line implications of building lower-cost, higher-emission plants vs. lower-emission alternatives. What is higher-cost today may be cost-effective tomorrow, once carbon emissions are constrained by national policy. The same need for certainty applies to other industries as well.

“Give us a date, tell us how much we need to cut, give us the flexibility to meet the goals, and we’ll get it done,” said Wayne H. Brunetti, CEO and Chairman of Xcel Energy, in *Business Week*.¹⁷ Jim Rogers, head of Duke Energy and chairman of the electric utilities’ main industry association, is a strong advocate of action to reduce carbon-dioxide emissions. He said the inevitability of climate regulations makes early action by companies all the more important. “I live with the vision we will live in a carbon-constrained world some day,” he said.¹⁸

Calls for changes in national policies are coming from a diverse array of companies—automobiles, chemicals, heavy and high-tech manufacturing, medical products, retail, information technology, and even major oil and gas companies. Recent examples of their public policy leadership on the issue include:

- In June 2005, 20 companies, including Ford, HP, Cisco, and Cinergy (now Duke Energy) called on the U.S. President and heads of the other G-8 countries to adopt market-based policies for limiting greenhouse gases.¹⁹
- The same month, five leading companies (Cinergy, DuPont, Baxter International Inc., United Technologies and Whirlpool) appeared before a House of Representatives Science Committee hearing on climate change and testified that they have been able to increase their profitability while reducing greenhouse gas emissions.
- Duke Energy, Exelon GE and Wal-Mart testified at the Senate Energy Committee’s climate conference in April 2006 in support of mandatory greenhouse gas regulations. Eight other companies, including BP, provided written testimony in support of mandatory controls.
- In July 2006, representatives of Baxter, BP, DuPont, Entergy, and GE briefed 60 staff members from both houses of Congress on the design of a cap-and-trade regulatory system.
- Major companies have even supported significant state actions on climate change, although they prefer uniform federal policies. This year, PG&E Corporation, Waste Management, HP, Interface and others backed the passage of California’s landmark law to reduce greenhouse gas emissions to 1990 levels by 2020. In addition, BP,

Entergy, Staples, Bank of America, and others supported the Regional Greenhouse Gas Initiative, an effort by seven northeastern and mid-Atlantic states to cap and trade carbon dioxide emissions from power plants.

Many of the businesses making the case for government action also see a pressing need for U.S. leadership in the international arena. Multinational firms in particular want to know that policies around the world will be as predictable, integrated and consistent as possible. They are operating in many countries that have signed the Kyoto Protocol and that will be requiring real reductions in emissions. For these companies, it makes sense to implement company-wide strategies for managing their emissions, rather than working under one set of rules in the United States or Australia, and another set of rules everywhere else. Companies also want to be sure that their competitors in developing countries, especially China and India, are soon subject to carbon constraints. Those with the most experience on the climate issue realize that the most important first step for getting China and India to move toward climate commitments is for the United States to adopt its own mandatory limits on emissions and to re-engage in the international effort to address climate change.

CONCLUSION

Businesses that are taking action to address climate change, both within their companies and in the policy arena, recognize two things: 1) regulation of greenhouse gas emissions is inevitable; and 2) mandatory climate policies, if properly designed, are consistent with sound business planning and good corporate governance. As more companies and more investors come to this realization, pressure will mount for other businesses to take a more responsible and proactive stance.

Long-term efforts to address climate change will not be cost-free—but early, voluntary action by companies such as those in the Pew Center’s Business Environmental Leadership Council proves that firms can achieve major reductions in ways that actually boost profits. The sooner that flexible, market-based regulations are put in place, the greater the likelihood of motivating climate action that achieves significant emissions reductions with minimal impact on the U.S. economy. With the right policies, the United States can become a global leader in producing the climate-friendly technologies that will dominate markets in the 21st century and beyond.

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More information on climate change solutions is available at www.pewclimate.org.

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