Harvard Business Review
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FORETHOUGHT SPECIAL REPORT

Climate Business | Business Climate

Reprint F0710A

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We don't know precisely how climate change will alter the planet, but two things are certain: Its complex environmental impact will directly affect business, society, and ecosystems; and governments will seek to mitigate its effects with far-reaching regulations. Until recently, companies have for the most part freely emitted carbon, but they will increasingly find that those emissions have a steep price, both monetary and social. As a result, businesses that continue to sit on the sidelines will be badly handicapped relative to those that are now devising strategies to reduce risk and find competitive advantage in a warming, carbon-constrained world.

In this month's Forethought, we've invited leading thinkers from business and academia to help our readers address climate issues by framing strategy, strengthening security, shaping policy, protecting reputation, and engaging customers, employees, and markets. This special section provides a hard-nosed look at a tough new environment. There will be winners and losers. Companies that get their strategy right will find vast opportunities to both profit and create social good on a global scale.

—The Editors

Grist: A Strategic Approach to Climate

by Michael E. Porter and Forest L. Reinhardt

Climate change is now a fact of political life and is playing a growing role in business competition. Greenhouse gas emissions will be increasingly scrutinized, regulated, and priced. While individual managers can disagree about how immediate and significant the impact of climate change will be, companies need to take action now.

Companies that persist in treating climate change solely as a corporate social responsibility issue, rather than a business problem, will risk the greatest consequences. Of course, a company's climate policies will be affected by stakeholder expectations and standards for social responsibility. But the effects of climate on companies' operations are now so tangible and

certain that the issue is best addressed with the tools of the strategist, not the philanthropist.

From Effectiveness to Strategy. There is no one-size-fits-all approach to climate change. Each company's approach will depend on its particular business and should mesh with its overall strategy. For every company, the approach must include initiatives to mitigate climate-related costs and risks in its value chain. Business leaders need to start treating carbon emissions as costly, because they are or soon will be, and companies need to assess and reduce their vulnerability to climate-related environmental and economic shocks. Every firm needs to get those basics right, as a matter of operational effectiveness.[1]

A firm that has more employees than it needs in its shipping department is operationally ineffective; its managers are wasting resources and creating a drag on performance. In the same way, a firm that produces excess emissions in its shipping operations is also operationally ineffective—it is wasting resources and incurring unnecessary costs that are certain to rise. Implementing best practices in managing climate-related costs is the minimum required to remain competitive.

In addition to understanding its emissions costs, every firm needs to evaluate its vulnerability to climate-related effects such as regional shifts in the availability of energy and water, the reliability of infrastructures and supply chains, and the prevalence of infectious diseases. The firm's leaders should systematically assess these risks and then decide which to reduce through redesigning operations, which to transfer to others through insurance or hedging contracts, and which to bear.

For some, but not all, companies, the approach to climate change can go beyond operational effectiveness and become strategic. Some firms, in the process of addressing climate change, will find opportunities to enhance or extend their competitive positioning by creating products (such as hybrid cars) that exploit climate-induced demand, by leading the restructuring of their industries to address climate issues more effectively, or by innovating in activities affected by climate change to produce a genuine competitive advantage. For example, an operational response to climate change in outbound logistics or after-sales service might involve more-efficient engines on delivery and service vehicles, or modified schedules to reduce traffic delays. By contrast, strategic approaches could involve reconfiguring the activity entirely: In outbound logistics, firms might replace physical books or manuals with electronic versions, and in after-sales service, they could supplant physical visits by service technicians with remote diagnostics and treatment programs.

Inside Out and Outside In. To set a firm's approach to climate change and assess the strategic opportunity, business leaders need to look "inside out" to understand the impact of the firm's activities on the climate and "outside in" at how changing climate (in both its physical and its regulatory manifestations) may affect the business environment in which the firm competes.[2]

To understand the inside-out impact, managers need to study the firm's value chain. Any value-chain activity—inbound logistics, operations, outbound logistics, marketing, sales, after-sales service—can generate emissions. The simple ratio of profits to total emissions in the value chain can be a very telling measure of potential climate impact. If new regulations put a price of, say, $10 a ton on emissions, would that put a significant dent in the profits or even swallow them altogether? "Carbon exposure" rises with the impact of carbon costs on profits. Like other risks, carbon exposure carries opportunities as well as challenges: Forestry companies, for example, may find that removing carbon dioxide from the air by planting trees may be as profitable as cutting them down and producing paper or plywood.

The emissions impact of activities in the value chain can be direct or indirect. Emissions can be generated by an activity under the firm's direct control or induced by the firm in the activities of suppliers, channels, and customers. A company needs to understand the emissions it causes its business partners to produce, as well as those it generates itself: Both types are important targets for reduction.

These changing inside-out impacts have potentially revolutionary implications. For example, modern supply chains, with their transportation-intensive, just-in-time inventory management systems, may no longer be optimal in a world with more costly emissions. Similarly, e-commerce, with its proliferation of small shipments, may face real limits. And in some cases offshoring, which drives up emissions by lengthening transportation hauls, may be supplanted by lower-

emissions onshoring to nearby clusters of suppliers.

High carbon exposure, as revealed by an inside-out analysis, does not by itself mean that climate is strategic for a firm. Once managers understand their firm's overall carbon exposure and the emissions impact of specific activities in the value chain, they can devise an action plan to address them. Emissions-intensive activities that add little value are candidates for elimination or outsourcing to more-efficient firms. Those that are important to value may become strategic if a company can reduce its exposure relative to competitors through improved performance.

Inside-out analysis helps shed light on the logic behind Wal-Mart's approach to climate. Wal-Mart's activities are logistics- and transportation-intensive, and the firm is actively seeking to reduce the resultant emissions. At first blush this approach looks purely operational: The firm is reducing energy use to mitigate the potential harmful effects of emissions on costs in its value chain. Wal-Mart's emissions-reduction programs will be strategic, however, if it can use its scale, scope, ability to invest heavily in technology, and reconfiguration of its value chain to reduce emissions in a way that is difficult for its smaller rivals to replicate. Wal-Mart seems to be making a strategic bet that it can reduce its carbon exposure more than competitors can and keep it lower.

In tandem with inside-out analysis, an outside-in look can reveal a new array of opportunities and threats. Climate change will affect a firm's business environment in two broad ways: through shifting temperature and weather patterns, and through regulations that increase the cost of emissions. Either can affect the availability of business inputs; the size, growth, and nature of demand; access to related and supporting industries; and the rules and incentives surrounding industry rivalry. Business leaders should evaluate how climate change may affect each part of this context for competition.

While property insurers' own carbon emissions may be low, for example, carbon exposure may be high for companies that insure or reinsure coastal real estate that is threatened by rising sea levels. Similarly, most of the carbon emissions associated with oil come not from oil companies but from their customers. Restrictions on emissions will constrain the demand for these companies' products. Or consider the multifaceted outside-in impact on a food company like Nestlé. Climate change will alter the relative productivity of various regions in which the firm buys agricultural commodities, affecting input costs. At the same time, the regulatory responses to climate change will raise the costs of energy used in keeping ice cream cold in retail outlets, which will affect demand conditions. And so on.

Firms can address outside-in effects strategically if they can manage them in ways that competitors cannot readily match. Nestlé eschews upstream vertical integration and instead outsources its raw material production. That makes its supply chain more flexible, which could provide valuable strategic advantage if the productivity of various regions shifts and Nestlé's competitors find themselves constrained by their more rigid supply structures. Likewise, drought-resistant crop strains and vaccines and treatments for insect-borne diseases will become increasingly valuable (as long as their innovators can protect their intellectual property).

Periodically, major new forces dramatically reshape the business world—as globalization and the information technology revolution have been doing for the past several decades. Climate change, in its complexity and potential impact, may rival them both. While many companies may still think of global warming as a corporate social responsibility issue, business leaders need to approach it in the same hard-headed manner as any other strategic threat or opportunity.

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1. For more on operational effectiveness and strategy, see "What Is Strategy?" by Michael E. Porter (HBR November–December 1996).
2. A full explication of inside-out/outside-in analysis is available in Michael E. Porter and Mark R. Kramer's article, "Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility" (HBR December 2006).

Risk: Investing in Global Security

by Peter Schwartz

Climate change may happen abruptly, and its effects could be devastating. How global companies respond today in the regions that may be hardest hit will affect the viability of the markets in those areas. Rather than retreat from them, however, companies need to improve their future resilience. This is as much a matter of strategy as of corporate social responsibility.

In the coming decades, we can expect to see sea levels rise and more extreme droughts, storms, and flooding. These events become security concerns for businesses when people are forced to flee, infrastructure is destroyed, ecosystems fail, agriculture is disrupted, economic volatility increases, and some regions become uninhabitable.

We know that climate extremes can destroy thriving business environments and even societies. The long, monstrous war in Darfur is properly understood as genocide caused by a struggle for resources that resulted from the kinds of events that will accompany climate change. Hurricane Katrina so severely damaged local infrastructure that many businesses still haven't recovered. Imagine what will happen when, with even a modest sea level rise, flood-prone Bangladesh experiences increasingly severe monsoons and is all but submerged: More than one hundred million people could be forced to seek refuge in neighboring India or China, causing dangerous social and economic strain. Or imagine a drought in southern China that radically reduces the flow of the Mekong River, which runs through six Asian countries. The conflicts that would arise around access to water—for irrigation, for households, for industry—could disrupt this region's fast-growing economies.

Companies need to anticipate the ways that climate change may directly affect their businesses, including supply-chain breakdowns, employee migrations, increases in disease, or even impact on reputation (multinational corporations may be blamed for climate-related environmental problems). But they also need to evaluate their risks more broadly, identifying whether the environments they operate in are susceptible to catastrophic, cascading climate-related disruption. To do so, they should systematically assess the vulnerability of these environments to floods, droughts, and storms, paying particular attention to areas that have a limited ability to anticipate and adapt to climate change. The most vulnerable will be places where, for example, the state has limited capacity to respond, the local ecosystem is fragile, urbanization is accelerating with few social services, and the water supply is already stretched. Haiti is perhaps the most extreme case, but India, the Philippines, and parts of Central America are all at risk. In such a stressed system, a severe, prolonged weather event could launch a crisis of interconnected events from which recovery might be impossible.

Companies can help vulnerable regions plan for climate change, reducing their own risks by making proactive investments and supporting policy initiatives that they might have resisted in the past, such as tougher local air and water quality standards. And, of course, firms can be prepared themselves to help with urgent relief efforts when some of the worst effects actually do come about.

In fact, the systems vulnerabilities created by climate change can turn into "systems opportunities" for businesses to develop novel partnerships with government, other players in the supply chain, and even traditional competitors, for example in preparing the infrastructure needed for disaster recovery. By taking a leadership role in helping regions anticipate climate change and mitigate risk, companies can advance their interests while building goodwill in the communities in which they do business. Coca-Cola's recently announced partnership with the World Wildlife Fund to help protect global water resources and improve the firm's own water management is a good example of a company's effort to address climate change both directly in its own operations and in the wider society it serves. Coke's actions are likely to help both the company and local communities, while enhancing the company's image around the world.

Multinational firms prepared to take the long view can avoid the worst consequences of climate change and perhaps help business build a stronger reputation as a powerful agent of societal well-being.

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Forecast: How Will a Warmer World Look?

During this century, climate change will cause extreme phenomena that will have significant repercussions for humanity, industry, and the environment. The timing and exact nature of the effects are uncertain, but scientists' best estimates, summarized in the table below, can help businesses think strategically about their response.

Projected changes this century	Expected impact		
	On industry, human settlements, and society	On agriculture, forestry, ecosystems, and water	On human health
More hot days[1], more frequent heat waves[1]	Higher energy demand for cooling Lower energy demand for heating Declining air quality in cities Fewer disruptions to transport from snow and ice Reduced winter tourism	Higher crop yields in colder environments Lower crop yields in warmer environments Increased water demand Increased insect infestation	Increase in heat-related deaths Decrease in deaths from cold
More frequent heavy precipitation[2], intense tropical cyclone activity[3]	Floods that disrupt settlements, commerce, transport, and societies Property loss Withdrawal of risk coverage by insurers More power outages that disrupt public water supplies	Crop, tree, and reef damage Soil erosion Waterlogging of soil, inhibiting cultivation	Increase in flood-related injuries and deaths Higher incidence of infectious, respiratory, and skin diseases
More areas affected by drought[3]	Shortages of water for industry and settlements Reduced hydropower Population migrations	Land degradation Livestock deaths Lower crop yields Wildfires	More food and water shortages Higher incidence of water- and food-borne disease
Rise in sea levels[3]	Movements of populations and infrastructure Property loss Withdrawal of risk coverage by insurers	Salinization of irrigation water, estuaries, and freshwater systems Shortages of freshwater	Increase in flood-related injuries and deaths More migration-related health problems

Adapted from "Climate Change 2007: Impacts, Adaptation and Vulnerability," Intergovernmental Panel on Climate Change, April 2007.

1: Virtually certain 2: Very likely 3: Likely

Transparency: What Stakeholders Demand

by Daniel C. Esty

As Apple sped toward the June 2007 launch of its innovative iPhone, the company hit an awkward bump in the road. An environmental group called Climate Counts released a scorecard ranking major corporations on their tracking, reporting, and reduction of greenhouse gases. Apple came in dead last in the electronics industry category, with a score of 2 out of 100. Accounts of Apple's abysmal performance spread instantly in the blogosphere and were reported by MSNBC, the *Wall Street Journal Online*, Reuters, and other mainstream media.

Should Steve Jobs be worried? Absolutely. Increasingly, customers, employees, and capital markets—as well as governments and NGOs—expect companies to release public reports on greenhouse gas emissions, make progress in improving energy efficiency, and hit targets for reducing emissions. Companies that fail to meet those expectations face potentially serious business consequences, for four broad reasons.

First, subpar environmental performance has become hard to hide and threatening to a company's reputation. The Climate Counts ranking of Apple was only the most recent in a series of damning evaluations of the company by such organizations as the Carbon Disclosure Project. Poor marks on reporting and managing climate impact are putting Apple's reputation for being cutting-edge and cool at risk.

That may seem far-fetched, given Apple's robust performance and passionate customers. But some environmental NGOs have begun raising consumer awareness about Apple's lack of environmental effort, the most notable being Greenpeace with its "Green myApple" campaign, which took the company to task for its "iWaste," and company executives, including Steve Jobs, have privately expressed concern about a backlash against the firm for its poor environmental ratings. In a May 2007 letter posted on Apple's website, Jobs acknowledged the criticism of the company's environmental performance and pledged to henceforth "openly [discuss] our plans to become a greener Apple."

Second, smart management of environmental issues has become a way to positively shape brand image and attract new customers. To date, the evidence on this front is anecdotal rather than rigorously statistical. But growing public interest in climate-friendly companies and products is driving many major firms to put a green stake in the ground.

Carbon reporting and emissions management has become a public relations battleground among supermarkets in the UK, for example. After Tesco pledged to invest £100 million in environmental technologies to reduce its energy consumption, Marks & Spencer announced that it would go "carbon neutral," coming out with a 100-point action plan on climate change and the environment. Conveying a dramatic sense of urgency, company CEO Stuart Rose observed, "We are calling this 'Plan A' because there is no 'Plan B.' "A few days later, Tesco responded by promising to label all 70,000 items it sells with data on each product's carbon footprint. Highly visible moves like these reveal a keen understanding of customers' shifting attitudes.

Third, reporting signals a company's seriousness about climate change and provides a gauge of its ability to track and manage emissions. That capability is seen by many observers, including Wall Street analysts, as a proxy for good environmental management, which studies show correlates with good general management and superior stock market performance over time. Reporting is similarly seen as a measure of corporate trustworthiness and good governance.

Fourth, financial markets are beginning to recognize that inattention to greenhouse gas emissions may soon have real cost and risk implications. Last spring more than 50 U.S. investors with a combined total of $4 trillion under management called on the U.S. Congress to enact legislation to curb carbon emissions. In a statement, the signatories, including investment funds for labor unions, state pensions, insurance companies, and major asset managers, wrote, "In the current unpredictable national climate policy environment, it is exceedingly difficult and risky for businesses to evaluate and justify the large-scale, long-term capital investments needed to seize existing and emerging opportunities…." Dozens of funds now screen companies for environmental and sustainability factors, including emissions reporting, and exclude poor performers. In July, for example, Citigroup downgraded coal stocks across the board, explaining in an equity research report that "[coal] company productivity/margins are likely to be structurally impaired by new regulatory mandates applied to a group perceived as landscape-disfiguring global warming bad-guys." Meanwhile, the number of environmental resolutions before shareholders in the 2007 U.S. proxy season set record highs, led by demands to address climate risks.

With the United States moving toward regulating emissions and Europe already imposing greenhouse gas limits, large companies that don't report are assumed to have high emissions. They're thus considered to be exposed to forthcoming carbon charges, as well as to current high energy costs, risks that could undermine their competitiveness. Meanwhile, companies that track greenhouse gases closely and report results appear better positioned to undertake serious emissions-control efforts and to minimize the consequences of new regulatory requirements.

Indeed, when buyout powerhouses KKR and Texas Pacific Group made a deal to acquire TXU, the big Dallas-based utility, they changed little except the company's plan to build 11 new coal-fired power plants, cutting that number to three. The private equity firms concluded that investing in coal today when carbon emissions were sure to be costly in the future made little sense. A broader trend here is worth noting: In 2006, TXU's stock price suffered after Environmental Defense activists launched a campaign opposing the coal plants, which made the company vulnerable. The prospect of takeover by

powerful private equity groups is likely to force a discipline on any company that fails to calculate its carbon exposure and adjust its strategy accordingly.

Beyond responding to stakeholder pressures, careful tracking and management of emissions prepares companies to manage climate change challenges systematically. Those who fail to monitor, report, and mitigate emissions face the prospect of mounting competitive disadvantage.

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Conversation: Alyson Slater, Global Reporting Initiative's director of strategy, on how disclosing emissions benefits companies

Carbon-emissions reporting is a laborious undertaking that publicly exposes potentially serious liabilities and risks facing your business—and it's voluntary. So why do it? We explored that question with Alyson Slater, the director of strategy at Global Reporting Initiative, an Amsterdam-based organization that has developed the most widely used framework of reporting principles, guidance, and standard disclosures on environmental, social, and economic performance.

Why should businesses care about voluntary reporting on carbon emissions?

It's the fiduciary duty of any company to ask, Is this issue important to our stakeholders? Today it is very difficult for a company to say that greenhouse gas emissions are not a subject of material interest to stakeholders. If you're a supplier to Wal-Mart, you have to answer yes. If you're in the oil and gas business, you have to answer yes. If you're a company looking for good access to capital markets, where more and more investment firms are considering climate change impact as part of a company's risk profile, you have to answer yes. Whatever sector or business you're in, disclosure is increasingly expected, and failure to disclose can put you at a strategic disadvantage.

How does the reporting process help a company address climate-related risks?

Companies quickly realize that reporting can't happen without strategy development. As firms start the process of putting a report together—talking to stakeholders, examining core businesses—they'll have to back up and ask, What is our strategy on climate change anyway? What is our approach to managing this risk? The discipline of sorting out which activities are material to report on and in what depth, and what data will be used to document progress, forces companies to formulate strategies. For companies that haven't been engaged in climate change and need to catch up with competitors that are disclosing, the reporting process is a stimulus for opening up a dialogue with stakeholders about the issue.

Just as important, the report serves as an accountability mechanism. It allows a company to make commitments and show through performance that it is doing what it said it would do. If you think about the "plan, do, check, act" cycle of corporate management, reporting provides the check: Here are our goals; here's the system we've put in place. Now let's see how we're progressing and where we need to readjust.

Aren't disclosures of potential trouble areas risky?

Companies' natural instinct, which we've seen across the board, is to avoid public disclosure on potential risks, whether it's greenhouse gas emissions or something else. But we've also seen how reporting creates a communications avenue through which companies can effectively and accurately position themselves with their stakeholders—investors, customers, regulators, and so on. You can't walk through an airport in Europe, for example, without seeing a BP poster for its "Beyond Petroleum" campaign. In this initiative, BP draws on hard facts from its reporting process as it works to shape the carbon-emissions debate and position itself as a leader in renewable energy sources. It's using report data—this is not greenwashing—to demonstrate its nimbleness as a company to adapt to emerging risks and be on the cutting edge of new opportunities.

From a governance standpoint, how much

weight should information from the reporting process carry?
It's a primary responsibility of the board and the CEO to determine the implications of their company's future climate risks and (a) report them and (b) mitigate them. Companies are adept at assessing their financial performance, but too many are afraid to look in the mirror and face potential risks that could damage their business. Directors want to know that a company will be as competitive over time as it is in the short run. That requires looking beyond the quarterly financial results. Financial reporting of course allows you to understand only a certain slice of a company's true market capitalization. Consider Coca-Cola: 20% of its market cap can be attributed to its book value, that is, its hard assets. Eighty percent of its value is attributed to intangibles—brand, R&D, risk management, ability to innovate in a globalizing and resource-constrained world—all things that are not captured in a financial statement. Sustainability reporting focuses squarely on those areas, which businesses traditionally have not done a good job of understanding and managing.

Interviewed by Christina Bortz.

Regulation: If You're Not at the Table, You're on the Menu

by Andrew J. Hoffman

When the companies of the United States Climate Action Partnership (USCAP)—businesses including GE, Alcoa, DuPont, and PG&E—announced their call for federal standards on greenhouse gas emissions in January 2007, the *Wall Street Journal* castigated these "jolly green giants" for acting in their own self-interest in promoting a regulatory program "designed to financially reward companies that reduce CO2 emissions, and punish those that don't." But seeking advantage is what companies do. Any company that can foresee business opportunities in influencing carbon-emissions regulation is practicing what is expected of business managers—capitalism.

Indeed, any company that sits on the sidelines as policy is formulated is recklessly playing the bystander to a significant shift in its market environment. Carbon-emissions regulation will burden certain companies, industries, and sectors more than others, and, likewise, will deliver advantage unevenly. Regulatory policy will set the rules of the game that affect how that burden will fall and how advantage will be delivered. It's time to plot how you'll respond.

At a minimum, all companies should know their carbon footprint—where their emissions are coming from and in what amounts (this may include understanding suppliers' footprints, too). At the next level, they can take steps to reduce emissions and calculate the costs per ton to make those reductions. The most advanced companies can parlay that experience into an advisory role with governments, gaining a seat at the table when regulations are designed. BP and Shell, for example, became savvy carbon-emissions traders in advance of any requirements, allowing them to become advisers to policy makers in the European Union.

Companies that hope to participate in policy making need to know the answers to two questions: First, what's on the table (what are the regulatory issues at stake)? And second, where is the table (where are standards being developed)?

What's on the table? To shape policy to your advantage, you must start by monitoring pending regulations and understanding how they may affect your business objectives. That requires being knowledgeable about the relevant language and issues. Here's a quiz:

__ Do you understand how cap-and-trade programs work or how carbon taxes might be applied? Do you know which of the possible programs under discussion would best serve your company's interests?

__ Do you have good intelligence on how carbon-emissions permits will be allocated, whether there will be economy-wide or sector-based standards, whether deeper reductions will be expected from upstream or from downstream industries, whether there will be a "safety valve" above which emission prices will not go, and what emissions will be counted (direct, indirect, or both)?

__ Do you know the difference between renewable energy credits, verified emission reductions, certified emission reductions, emission reduction units, and European Union allowances? Do you know how to make deals under the Clean Development Mechanism and the Joint Implementation?

If your company doesn't know the answers,

you're probably ill-prepared to participate in policy development and already missing out on the fast-growing carbon-trading market—one that roughly tripled from $11 billion globally in 2005 to $30 billion in 2006.

Where is the table? Climate-related standards are being set at the state, national, and international levels. Which will become the dominant standard? Answering that question tells you which table to sit at but requires making a calculated guess among an array of possibilities.

For example, a company in the New England region of the United States might focus on shaping local policy in the near term and become involved in the Regional Greenhouse Gas Initiative in the Northeast and Mid-Atlantic United States. On the West Coast, a company could lobby the California Air Resources Board as it develops mandatory emissions-reporting rules. Or a U.S. company could lobby in the 47 states that, according to a July 2007 report, had begun to inventory emissions, developed renewal portfolio standards and climate action plans, or committed to a cap-and-trade system. Thinking more broadly, the firm could lobby at the federal level on one of the more than 100 climate-related bills making their way toward a vote. On the international level, and thinking in the longer term, a company could engage with the United Nations Framework Convention on Climate Change as it debates what rules will be established after the Kyoto treaty expires in 2012.

Establishing a presence at each of these tables would require tremendous resources. An efficient alternative is to join one of the many industry or activist groups or trade associations that are weighing in on these myriad negotiations, such as the Chicago Climate Exchange, USCAP, the Pew Center's Business Environmental Leadership Council, the Global Roundtable on Climate Change, or the World Business Council for Sustainable Development. Participation in such organizations can keep you informed about policy development and give you the tools to help you shape it.

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How Do Renewable Energy Certificates Work?

When a wind turbine or solar panel generates a megawatt hour of electricity (a little more than an American home uses each month, on average), that clean, carbon-emission-free electricity flows into the utility grid, where it combines with "dirty" electricity produced by fossil-fuel power plants. The producer of that megawatt hour of clean electricity is allowed to print and sell one renewable energy certificate (REC), representing that quantity of clean electricity. People or organizations can buy that REC, regardless of where they get their electricity or how dirty it is, and claim that their purchase neutralizes some of the carbon emissions created by their electricity use. Of course, it has done no such thing. The problem is that most RECs are merely pieces of paper documenting the generation of electricity by wind farms or other green producers. Such cheap RECs don't cause clean electricity to be made; they're an afterthought printed up to bring in additional revenue. As such, most don't actually offset the buyer's carbon emissions or reduce the amount of carbon put into the air.

Reputation: When Being Green Backfires

by Auden Schendler

In the past two years, companies have battled to outdo one another in their high-profile purchases of certificates symbolizing "green" electricity produced by wind, solar power, and other carbon-free, climate-friendly means. The problem is that the buying spree, meant to burnish companies' green credentials, may end up tarnishing them.

Consider this: In January 2006, Whole Foods announced the purchase of renewable energy certificates (RECs) representing the production of 458,000 megawatt hours' (MWh) worth of green electricity but was soon trumped by Wells Fargo, which bought 550,000 worth. Then Pepsi surged ahead last April with an unprecedented 1.1 million MWh REC purchase. The companies trumpeted their purchases with claims that they "offset" or, in effect, neutralized some of their carbon emissions. I made similar claims when my own company purchased RECs.

Anytime there's a feeding frenzy, you have to ask, What's so tasty? Why are businesses falling over one another to buy these pieces of paper? Printed by producers of energy each time they generate clean electricity—and then sold to hungry buyers—the certificates merely sym-

bolize green energy. (For more, see the box "How Do Renewable Energy Certificates Work?")

Most businesses will say they're buying RECs because they care about the environment and climate change. Fair enough. But for many, buying RECs is a relatively inexpensive way to make a powerful brand-positioning statement. In one stroke, a business can don the environmental mantle, seemingly legitimately and at an affordable price, without having to directly and expensively do anything to reduce carbon emissions. Certainly, corporate reputations have been enhanced by large REC purchases.

The danger in buying RECs is that the mainstream press has begun to challenge claims about their environmental value. Articles have appeared in publications including *BusinessWeek* and the *Financial Times* pointing out that most RECs don't actually offset emissions, and the skepticism is spreading across the Internet. Indeed, most RECs don't result in the creation of clean electricity, which would have been generated anyway, whether or not an REC was printed. As consumers become increasingly savvy about evaluating companies' environmental claims, businesses that tout REC purchases may expose themselves to charges of greenwashing.

A report released in 2006 by an environmental organization called Clean Air–Cool Planet was among the first to rigorously examine the environmental impact of RECs. The report found that while most RECs don't lead to carbon-emissions reductions, a minority do, by directly helping to finance, say, the construction of a new wind farm. Companies that buy RECs and want to avoid charges of greenwashing should seek out these higher-quality and more costly certificates, whose purchase directly and demonstrably helps reduce carbon emissions.

RECs, supporters argue, create a market mechanism that spurs the development of new wind, solar, and other green-electricity plants. As demand for RECs grows, their prices will rise, encouraging developers to build more renewable power facilities that can generate income through increasingly profitable sales of the certificates. Unfortunately, because there has been such a surplus of cheap RECs—and no easy way to distinguish between high- and low-quality offerings—the market mechanism has remained stalled for the most part. If companies, mindful of their reputations, reject inferior RECs and begin demanding quality ones, that could jump-start the production of renewable electricity and actually reduce carbon emissions. Corporate scrutiny and activism might even foster the development of a badly needed tool that could clean up the entire REC industry in one masterstroke: a third-party gold standard for REC quality.

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Balance Sheet: Accounting for Climate Change: A Window on the Future

by Vicki Bakhshi and Alexis Krajeski

How will the prospect of climate change affect your business over the medium term?

To answer that question, we've dreamed up a 2010 consolidated balance sheet for a fictional company. We've also imagined that the statement's notes would detail the impact of climate change on the firm's fortunes.

The company, based in the southern United States, is a medium-size manufacturer (9,000 employees) that sells electrical components to businesses and, through retailers, lightbulbs and batteries to consumers—a company that in some ways is on the front lines of climate change. To highlight the possible effects of climate-related severe weather, we've imagined that the firm was directly affected by the devastating hurricane season of 2005 and is still dealing with the aftereffects.

To focus specifically on climate, we've had to leave a great deal out of the statement. We've concentrated on the three areas most likely to be affected: product portfolios, property assets, and long-term liabilities. Look for the impact on those areas in the explanatory notes.

Consolidated Balance Sheet (in $ millions)

As of December 31	2010	2009
Assets		
Cash and cash equivalents	166	113
Accounts receivable	343	290
Inventories	262	269
Property and equipment	195	252
Tax credits	4	2
Intangibles	161	102
Liabilities and shareholders' equity		
Accounts payable	162	141
Taxes	26	27
Accrued expenses	160	136
Pension liabilities	97	86
Commitments and contingencies	see notes	see notes
Shareholders' equity	686	638

Note: This is not a complete balance sheet.

Notes on the 2010 Consolidated Balance Sheet
The Company's new strategy, unveiled in 2007, capitalizes on the opportunities created by the sharp rise in energy costs and focuses on developing a full range of energy-efficient electrical products. A cornerstone of this strategy is the recently completed acquisition of Malcolm & Angus, an electrical engineering and design firm with an outstanding track record in this area. The acquisition brings new capabilities, forward-looking thinking, and valuable patents to the Company. In addition, the acquisition will help us attract capital from firms seeking green-oriented investments.

ASSETS

Cash and cash equivalents. In response to rising market demand for energy-saving components and lighting solutions, the Company has shifted to a high-efficiency product portfolio that in 2010 generated strong profit growth. Cash balances rose sharply as a consequence of strong demand from Wal-Mart and other large retail customers, in particular for our high-efficiency compact fluorescent lighting products. However, the rise in cash was tempered by a steep increase in insurance premiums in the wake of the claims we filed for severe damage to our Biloxi, Mississippi, facilities as a result of the 2005 hurricane season.

Accounts receivable. Our new energy-efficient product portfolio has enabled us to expand our retail distribution network, leading to a rise in accounts receivable from natural-foods supermarkets, where our solar rechargeable batteries are a top seller.

Property and equipment. Our Biloxi facility never fully recovered after the 2005 hurricane season, and it was finally closed in 2010, triggering a $38 million write-down to the property account. Our Corpus Christi, Texas, site has been upgraded to ensure greater wind and flood resistance. We also installed highly efficient HVAC and sensory lighting systems, which will reduce our energy costs, but had to retire our existing HVAC system early, triggering a write-down of $10 million.

In 2008, the Company designed its new Atlanta headquarters to meet the Leadership in Energy and Environmental Design (LEED) Platinum standard for environmentally sustainable buildings. Although the building had slightly higher up-front costs, the introduction of the U.S. cap-and-trade system for carbon emissions has, as expected, resulted in a sharp appreciation in the property's market value. This has enabled us to obtain a long-term loan to fund the acquisition of Malcolm & Angus that was collateralized by the property, thereby resulting in an increase to long-term assets. We have also announced the phased closure of our now-uneconomic operations in Nashville, Tennessee, and Pensacola, Florida, resulting in 370 job losses and a write-down in plant and equipment of $62 million. We recently purchased a facility in Mexico, where planned efficiency improvements will generate carbon savings that will earn Clean Development Mechanism credits under the new UN rules.

Tax credits. The 15 wind turbines the Company installed on part of its Corpus Christi site in 2007 are now fully operational and generated surplus electricity that was exported to

the grid, thereby earning a production tax credit.

Intangibles. In acquiring Malcolm & Angus, the Company paid five times book value, recording $59 million in goodwill.

LIABILITIES

Accounts payable. Accounts payable rose because of a generalized growth in trading volumes, as well as the more generous payment terms we have negotiated with our suppliers of incandescent lightbulbs. With the ban on sales of incandescent lightbulbs already in effect in Australia and going into effect in parts of Canada and elsewhere in coming years, the Company is phasing out in-house manufacture but will still supply incandescents to customers. Accordingly, outsourcing of incandescents lifted accounts payable by $5 million.

Pension liabilities. The Company's pension investments, which were heavily exposed to several coal-burning U.S. electric utilities, suffered serious losses because of the newly enacted cap-and-trade system. We dismissed our fund managers and replaced them with new managers who are signatories to the UN Principles for Responsible Investment and who actively consider climate change as part of the investment process. Actuarial projections indicate that the Company must contribute $21 million to the pension plan within the next three years. This has been deferred to allow the pension fund to record an immediate $11 million adjustment arising from the closure of the Biloxi plant.

Commitments and contingencies. In the aftermath of the U.S. Supreme Court's 2007 ruling that greenhouse gases can be considered pollutants under the Clean Air Act, our lawyers have advised us that it would be in shareholders' interest to negotiate a settlement with the Environmental Protection Agency to resolve any future liability for historical emissions pollution. The settlement is expected to reflect the significant investments the Company has already made to bring its operations in line with best practice, thereby reducing current emissions to a minimum.

Strategic change inevitably poses risks, and there may be unforeseen developments in the markets we are entering. Nevertheless, the Company's senior management team believes it has developed a strategic plan that manages those risks effectively and positions the Company to capture the growth opportunities that we expect will arise as it adjusts to the impact of climate change in its core market.

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Markets: Investors Hunger for Clean Energy

by Theodore Roosevelt IV and John Llewellyn

Demand is surging among investors, both professional and private, for business ideas that will take advantage of changing views and regulations on greenhouse gases. Because currently there are not enough good projects to jump into, however, it remains largely unmet.

Investors have been waking up to the opportunities of the new environmental era over the past several years. Institutions were among the first to put money into sustainable energy companies. Lately, hedge funds—some of which had already entered this space—have aggressively increased their pursuit of environmental investments. And there has been overwhelming demand from private equity investors and wealthy individuals.

Worldwide investments in sustainable energy (including wind, solar, and water power) more than doubled from 2004 to 2006, to $70.9 billion, according to a 2007 report by the United Nations Environment Programme and the firm New Energy Finance. Venture capital and private equity investments in sustainable energy increased by 69% in 2006, to $8.6 billion.

Virtually any firm in any sector can reap the benefits of investors' growing interest in climate change. Companies that make or sell energy technologies, hybrid cars, insulation products, or any of the thousands of other climate-related products and services have an obvious edge in attracting green capital. However, corporate operations almost always generate greenhouse gases, and investors assume that a price on those emissions is inevitable. If a company can show that it has diversified its energy sources to include those that produce little or no emissions and that it has shrunk its per-employee power use, the capital markets will respond favorably.

Another way to attract green investment money is to acquire or take a stake in companies that specialize in clean tech. Wall Street firms have taken this approach, investing in renewable energy companies.

Still, most investors have been unable to find suitable green initiatives. A recent survey showed that fewer than 20% of investors had alternative-energy-focused investments, despite strong interest in this space. To us, that indicates a lack of green investments that meet investors' requirements.

There are several reasons why the demand for green investments outstrips the supply. Many of the investors who are most intensely interested in climate change don't want to dilute their investments by putting money into diversified companies—they want their investments to go directly to green technologies or strategies. On the other hand, the diversified companies that have good green businesses, such as solar energy units, often do not want to spin them off because they want to experience all the potential gains they see in those businesses.

The desire for green investments is so intense, and the supply currently so limited, that if investors aren't disciplined, the excess demand could cause a bubble in the future. If such a bubble formed and then burst, the markets might conclude, erroneously, that investing in climate initiatives isn't a good idea. But so far that is not what we are seeing. Our interactions with fund managers indicate that the good hedge funds and private equity firms are doing what they've always done when approaching an investment—digging down into the details and performing their due diligence.

This is why companies have to go about attracting green capital the right way, because even in this new carbon-conscious era, serious investors are continuing to apply all the old rules: The firms they invest in must have good management, be able to execute initiatives well, and be able to make money.

The pricing of greenhouse gas emissions will create an economic transformation of the first order, with the potential to be even larger than globalization. Investors now recognize that the impact on the world and national economies will be enormous. The companies that will be the most successful in attracting green capital will be those that share investors' view of the importance of this change. Investors will not expect all companies to be experts in climatology, but they will expect every company to see and understand a trend of this magnitude and make sure the firm does not get left behind.

Theodore Roosevelt IV is a managing director at Lehman Brothers and the chairman of the firm's Council on Climate Change. He is based in New York. John Llewellyn is a managing director at Lehman Brothers and the firm's senior economic policy adviser. He is the author of the report "The Business of Climate Change: Issues Arising." He is based in London.

Business to Business: Leading Change in Latin America

by Maria Emilia Correa

While it may be tempting for companies in developing countries to focus on growth and profits before they even begin to address climate change, our organization is finding that sustainability actually confers competitive advantage. At Masisa, the $886 million forestry and wood-manufacturing company in Chile where I oversee social and environmental responsibility, a key part of our strategy is to engage business-to-business customers in our efforts to become greener. Because the forestry industry faces growing criticism in Latin America and worldwide regarding its impact on the environment, it makes strategic sense for Masisa to differentiate itself in the marketplace not only by reducing its carbon footprint but also by helping others to reduce theirs. So we're conducting an experiment with our B2B customers: We're telling them what we're doing to address climate change and advising them on their efforts, with the double goal of positioning Masisa as a leader in carbon reduction and capitalizing on our enhanced reputation.

According to our market research, our products' final consumers—people who are remodeling their kitchens or buying new furniture—consider a company's impact on the environment to be their second priority, right behind product design and durability, when they make purchases. (Three years ago they didn't even include it among their top ten concerns.) So it stands to reason that the businesses directly serving those customers would want to forge—and publicize—strong relationships with the suppliers that have set the most aggressive carbon-reduction targets. To show how serious we are about reducing emissions, we have joined

the Chicago Climate Exchange, which requires us to commit to a 6% decrease by 2010 (measured from a baseline established from 1998 to 2001). The steps we are taking to reach that goal include planting rapid-growth trees such as pine and eucalyptus in our forests to capture carbon from the atmosphere, burning biomass (sawdust and wood chips left over from sawing and manufacturing) to generate two-thirds of our energy, using combustion gases from thermal plants and boilers as fuel, and optimizing distances between equipment and work areas to decrease overall energy consumption.

Masisa sells its wood boards through Placacentros franchise stores, where carpenters buy what they need to build furniture and to do more extensive work on homes and commercial buildings. There are some 300 Placacentros stores in Latin America, and Masisa is inviting its business partners, the franchisees, to help improve the carbon footprint of its value chain. We start by providing them with basic education, mainly workshops that cover the fundamentals of climate change. Then we suggest ways to identify emission sources and offer ideas for tracking and reduction. Additionally, we demonstrate that certain improvements—such as skylights and energy-efficient equipment—will lower costs. We are also planning to give the Placacentros marketing materials to share with their customers; these will describe the benefits of using wood instead of cement and steel, for instance, which require more energy to produce and are nonrenewable.

Although it is still too early to say how much of an impact our experiment with B2B customers is making directly on revenues, we see signs that it is deepening customer loyalty. This year, as we have renegotiated our franchise agreements, many of our partners have granted us preferred supplier status. They're telling us it's because they value the support that Masisa gives them in carbon reduction and other areas where they may be struggling, and because they want to be associated with a brand that is recognized for environmental responsibility as well as product quality and design.

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Leadership: Walking the Talk at Swiss Re

by Mark Way and Britta Rendlen

Internal programs to coax employees to reduce their carbon footprints are getting to be commonplace among consumer-facing companies: Clif Bar, Patagonia, Timberland, Google, and Bank of America, to name a few. But is there a business reason why such an initiative might benefit a company that *can't* derive consumer-loyalty dividends from it?

Swiss Re, an insurer of insurers that is largely unknown to the public, has put its money and muscle behind an incentive program to persuade employees to do such things as drive hybrid cars, use energy-efficient appliances, and install solar panels. The strategic reasons: The company believes that the potentially catastrophic effects of climate change pose a major risk to its industry and its customers, and is committed to combating it. The employee initiative reinforces the firm's essential message to stakeholders, aligns employees' actions with company priorities, and shows, to put it simply, that Swiss Re walks the talk.

The COYou2 Reduce and Gain program, which also includes educational initiatives such as Lunch & Learn sessions for employees, is an outgrowth of Swiss Re's almost two-decade-long focus on the risks of climate change. The company's four-part climate strategy consists of understanding the risks, developing new products and services to address them, raising risk awareness, and reducing Swiss Re's own carbon footprint. The latter point has as much relevance as the others: The company would hardly be perceived as a leader in the climate change debate if it did not keep its own house in order. Fostering the company's credibility is crucial because of the central role that trust plays in its business model.

Back in 2003, Swiss Re became the first major financial services provider to pledge to become greenhouse neutral. Swiss Re plans to meet that goal by 2013 through reducing the company's emissions by 15% per employee and offsetting the remainder with investments in the World Bank's Community Development Carbon Fund. COYou2 furthers that commitment by encouraging employees to do their part.

The program, launched by CEO Jacques Aigrain in early 2007 and scheduled to run through 2011, is available to employees in 25

countries who have been with the company for at least two years. The company reimburses employees up to 50% for a range of investments made for their personal use. The minimum reimbursement amount is CHF 500, and the cap is CHF 5,000 per employee. (The amounts in other currencies are similar but are adjusted to the local cost of living.) As of June 2007, more than 2.5% of all eligible Swiss Re employees had participated.

Mark Way, based in Armonk, New York, is the head of Sustainability Issue Management & Reporting at Swiss Re and part of the company's Sustainability & Emerging Risk Management unit. Britta Rendlen, based in Zurich, is a senior sustainability adviser with that unit and the project manager of COYou2 Reduce and Gain.

Opinion: Place Your Bets on the Future You Want

by Forest L. Reinhardt

Which firms will gain and which will lose as governments and businesses begin to take climate change seriously? Corporate balance sheets provide a few clues: As greenhouse gas emissions get costlier, the relative value of such assets as natural gas, which produces less carbon dioxide than coal when burned, will increase. Other clues can be found in firms' current efforts to reduce emissions: A company's ability to analyze the trade-offs inherent in initiatives such as cutting overall transportation distances will become highly valuable in a world where the right to emit greenhouse gases is limited.

Ultimately, though, success in a carbon-constrained world will be determined not by short-term balance sheet effects or efficiency initiatives but by innovation, management acumen, and leadership. The companies that have seized the big opportunities in changing economic landscapes have been those with bold visions of the future, not necessarily those whose hard assets seemed to position them best for success. Think of Toyota and Wal-Mart. No one could have guessed merely by looking at Toyota's balance sheet in the 1940s or Wal-Mart's in the 1960s that those firms would so successfully capitalize on globalization.

The firms that come out ahead when emissions cost money will be those that make bold moves now, refocusing strategy and operations to take advantage of the opportunities and skirt the dangers raised by the prospect of climate change. Taking bold steps doesn't just mean chasing after what are sometimes touted as "win-win" solutions, such as quick-payback investments in energy efficiency. Moves like that are obviously necessary, but they aren't enough by themselves. Companies need to get past the win-win rhetoric and move on to the tough trade-offs.

Many of the climate-related investments a company might make won't pay for themselves until some other firm is making complementary investments. Alternative-fuel cars need a refueling infrastructure. Specialized facilities that liquefy natural gas for transoceanic shipment are valuable only if there are terminals for off-loading the cargo and turning it back into gas at the other end. And many carbon-reducing investments won't deliver shareholder value until governments act to make emissions expensive.

For centuries, the North Atlantic cod fishery fed millions of people, but there were no property rights controlling access to fish in the sea, so fishermen didn't treat the resource as scarce. In the early 1990s, the fishery collapsed. Governments have since established sensible systems of tradable catch permits that seem likely to prevent the collapse of other species, but it was apparently too late to resurrect the cod fishery. The atmosphere's ability to absorb emissions is now similarly limited, precisely because we thought that could never happen. A system in which we pretend that carbon emissions cost nothing subsidizes, at our children's expense, every producer and consumer of energy today. To be efficient, we need to eliminate those subsidies. That means pricing carbon.

Business leaders must be courageous in betting on the long-term future that will benefit their companies the most—that is, on a future where governments constrain, in transparent and reasonable ways, the human impact on the climate. Firms can invest now and participate in voluntary interfirm trading systems to develop expertise in them and show governments, regulators, and the business community how robust such systems can be. Companies can also lobby for governments to implement sensible systems that tax carbon emissions or that cap them and encourage the trading of carbon credits. By betting on the future they

want, corporations will make that future all the more likely. Prudent businesspeople may balk at the idea that they should stick their necks out and, in some cases, act unilaterally on climate change. But their necks are already exposed. The status quo will not persist. Inertia and incrementalism amount to big (and risky) bets too—bets that the future won't be much different from the present.

After World War II, the Americans advised Japanese companies to concentrate on labor-intensive, low-value products in which Japan was said to have an advantage. Instead, the Japanese invested in producing capital-intensive, income-elastic goods such as automobiles and electronic equipment, believing that a critical mass of consumers would eventually get rich enough to buy those products. Had the firms bet wrong, the strategy would have failed. But had they not taken bold steps toward the future they wanted, Japan would have remained poor no matter how the world economy evolved.

Companies that might derive short-term benefits from subsidies—for corn-based ethanol, for example, or wind-powered electricity—will be tempted to lobby for them, and the government will undoubtedly find it politically easier to pile subsidy on subsidy rather than tax emissions or establish a coherent cap-and-trade system. But subsidies won't fix the climate problem, and any business in which subsidies drive profits is not healthy or sustainable. Strong business leaders should want a transparent system that prices the right to generate carbon emissions as though it were any other scarce resource and lets firms get on with the business of competing.

Forest L. Reinhardt is the John D. Black Professor of Business Administration at Harvard Business School in Boston.

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