

# Our Transition

The Center for Climate and Energy Solutions (C2ES) is an independent nonprofit organization working to promote practical, effective policies and actions to address the twin challenges of energy and climate change. Launched in 2011, C2ES is the successor to the Pew Center on Global Climate Change. This report was originally published by the Pew Center on Global Climate Change. For more information, please visit [WWW.C2ES.ORG](http://WWW.C2ES.ORG)

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# CLIMATE CHANGE 101

## Business Solutions



The response of business leaders to the problem of climate change is undergoing a major transformation. Just over a decade 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 willingness among corporate leaders to help shape solutions. In addition to acting on their own to reduce greenhouse gas emissions and explore new, low-carbon market opportunities, a growing number of businesses are calling on the government to provide investment certainty through clear climate policy.

### ASSESSING THE RISKS

For corporate leaders responsible for paying attention to the full range of risks confronting their businesses, climate change has become an issue that can no longer be ignored. As Marsh, one of the world's leading risk and insurance services firm has stated, "Climate change is a clear example of a risk where long-term planning is essential to mitigate some potentially irreversible long-term effects."<sup>1</sup>

Insurance companies have played an important part in drawing attention to the risk of economic losses from climate change. According to reinsurance company Swiss Re, economic losses from climate-related disasters are already substantial and rising: insured losses have jumped from an annual \$5 billion to \$27 billion over the last 40 years and without further investments in adaptation, climate risks could cost some countries up to 19 percent of annual GDP by 2030.<sup>2</sup> Swiss Re has also said that "it's not possible to predict precisely what the climate will be like in the future. And yet, there is growing consensus that the consequences of unabated climate change are likely to be very serious... After all, this much is certain: inaction would be far more expensive than taking action."<sup>3</sup>

**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 mandatory limits on greenhouse gas (GHG) emissions. Nearly all business leaders surveyed for the Pew Center's report, *Getting Ahead of the Curve: Corporate Strategies That Address Climate Change*,<sup>4</sup> viewed national GHG regulations as inevitable in the United States. More recently, a survey released in 2008 by McKinsey & Company of more than 2,000 global executives found that more than 80 percent of those polled expected some form of climate change regulation in their companies' home country in the next five years.<sup>5</sup>

A major reason why businesses view national climate regulations as inevitable is because a number of U.S. states and regions have already put in place mandatory policies to reduce GHG emissions.<sup>6</sup> Power generators in 10 northeastern states already have to comply with the Regional Greenhouse Gas Initiative (RGGI), a limited cap-and-trade program for the power sector; California has been designing climate regulations (including emissions trading) in response to the landmark AB 32 bill passed in 2006; and a broader emissions trading system could also soon get underway between California, several Canadian provinces, and possibly other western states. Additionally, for the past several years, some U.S. businesses with operations in Europe have had to comply with the European Union's (EU) GHG emission trading system.<sup>7</sup> Finally, the Environmental Protection Agency (EPA) is also moving forward with GHG regulations in several sectors.



The effect of regulations on businesses could be significant, especially for firms with large carbon footprints—though climate policy would provide both risk and opportunity. As a result, many companies have begun taking action to reduce their emissions even without regulation. For example, EPA’s voluntary Climate Leaders program, which enlisted companies to measure GHG emissions and set long-term reduction targets, grew from its initial 11 partners in 2002 to more than 200 in 2010.<sup>8</sup>

Companies set voluntary goals for a number of different reasons, including getting a head start over competitors in learning what climate strategies work, preparing to respond rapidly once regulations take effect, better managing the costs of reducing their emissions over time, reducing costs in the short term by improving energy efficiency, and responding to consumer and shareholder demands for climate action. In addition, many companies recognize that acting early to reduce emissions is an important way to gain both credibility and influence with policymakers.

**Threats to Competitiveness.** Government climate policies and growing customer awareness about climate change 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 related trends: a decline in the value of inefficient and GHG-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 GHG emissions. Under this scenario, investors may also be exposed to significant risk. This is one of the reasons several major banks, including Citi, JPMorgan Chase, and Morgan Stanley, came together in 2007 to unveil the “Carbon Principles,” which lay out a process lenders can use to scrutinize more closely the potential regulatory risks associated with coal-based power plant investments.<sup>9</sup> In the transportation sector, car companies that produce mainly gas guzzlers already are losing market share to competitors that produce higher numbers of efficient hybrid and diesel models. Market dynamics appear to be shifting as record high gasoline prices in 2008 and new domestic fuel economy regulations in 2009 are driving major U.S. automakers to shift some production to smaller, more fuel-efficient vehicles.<sup>10</sup>

## Businesses Face Growing Pressures to Disclose Climate Risks and Strategies

An increasing number of investors realize 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 2010 proxy season, investors filed a record 101 climate and energy-related shareholder resolutions with 88 companies—nearly 50 percent higher than the number filed two years ago—many of them seeking greater analysis and disclosure of business impacts of climate change and future regulation of GHG emissions.<sup>11</sup>
- 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 GHG emissions and climate strategies. The 2010 CDP disclosure request was sent to 4,700 companies under the signatures of 534 institutional investors with combined assets of \$64 trillion—up over fourteen fold from \$4.5 trillion in 2003. In 2009, 2,456 companies responded to the questionnaire. This was a significant increase over 2003, when only 235 companies responded.<sup>12</sup>
- In February 2010, the Securities and Exchange Commission (SEC) issued guidance for public companies on the disclosure of both actual and potential consequences of climate change-related regulations, business trends, and physical effects of climate change. While only guidance, the document clearly demonstrates that the SEC also recognizes that many firms are coming under increased scrutiny for the risks and opportunities that climate change presents.<sup>13</sup>

**Physical Risks to Business.** Businesses also face risks from the projected impacts of climate change, including stronger hurricanes, increased drought, sea level rise, and flooding. The industries most likely to be affected directly by these physical risks include agriculture, forestry and paper products, tourism, real estate, offshore energy development, and insurance.<sup>14</sup>

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 experienced following Hurricane Katrina in 2005, the loss of oil and gas platforms in the Gulf of Mexico not only increased 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.

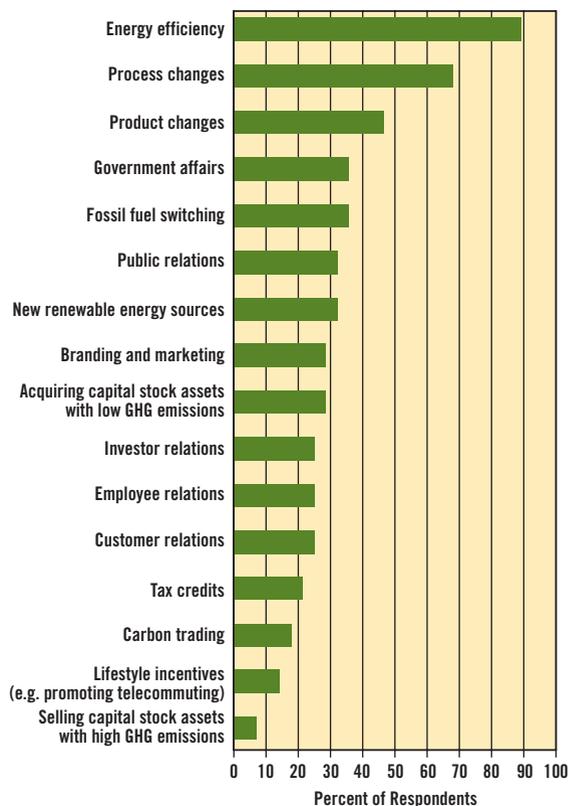
Some companies have begun taking steps to address the physical risks of climate change. Entergy, the New Orleans-based electric utility, began relocating important business operations to areas less vulnerable to severe weather events after suffering \$2 billion in losses from Hurricanes Katrina and Rita. Mining giant Rio Tinto has also taken steps to buffer its business against physical risks, including using high-resolution climate modeling to conduct detailed site assessments and gauge risks to high-priority assets.<sup>15</sup> More examples along these lines can be found in the Pew Center brief: *Adapting to Climate Change: A Business Approach*.

**Reputational & Litigation Risks.** In addition to regulatory and physical risks, businesses face additional climate risks, both in terms of their reputation and from litigation. For example, companies complying with EPA’s mandatory reporting rule face the prospect that their GHG emissions will be publicly reported in the spring of 2011, which could have a “naming and shaming” impact on some companies, though many of these companies already report emissions through other venues.

With regard to litigation, the number of climate-related nuisance lawsuits continues to increase. One of the most famous of these is from Alaska, where the City and Native Village of Kivalina has sued 23 energy companies. Plaintiffs claim that defendants’ GHG emissions result in increased temperatures that allegedly have melted sea ice near the village, exposing it to storms and eroding the land on which it sits. The plaintiffs seek monetary damages for the cost of relocation, which they estimate to be between \$95 million and \$400 million. In *Comer vs. Murphy Oil*, Mississippi residents claim defendants’ GHG emissions contributed to global climate change, intensified Hurricane Katrina, and resulted in hurricane-related damages to plaintiffs. While this case was thrown

**Figure 1**

**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

out in 2007, as of November 2010, that decision is under appeal. A third such case is Connecticut vs. American Electric Power, in which eight states and three land trusts filed lawsuits against five utilities alleging that the utilities’ carbon dioxide (CO<sub>2</sub>) emissions contribute to the “nuisance” of global climate change. This case is still active and similar ones seem likely in the coming years.

**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 already begun to reduce their GHG emissions demonstrates there are numerous options that can both decrease costs and increase profits. Figure 1 shows a ranking of programs that

benefit the bottom line based on a 2006 Pew Center poll of 33 major corporations. Also, climate policy can be designed so that businesses can respond with innovative solutions that will minimize costs.

As described in the Pew Center brief *Clean Energy Markets: Jobs and Opportunities*, among the companies that have leading climate strategies, there is a major shift underway from a focus on risk management and emission reductions toward 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. (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 emerge as major producers. In fact, low-carbon technologies are already experiencing explosive growth in the market place. CleanEdge, a clean technology market research firm, reported that revenue from solar photovoltaics, wind, and biofuels grew from \$55 billion in 2006 to \$144.5 billion in 2009, a nearly three-fold increase. CleanEdge estimates that global revenues from these clean energy technologies could surpass \$343 billion within a decade.<sup>16</sup> Key suppliers of components for these new

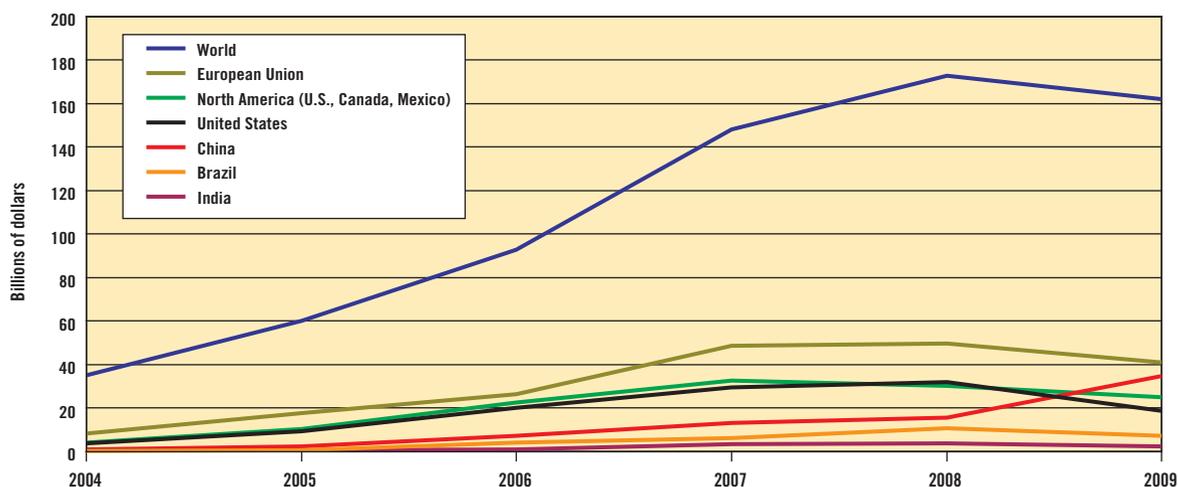
technologies—for example, manufacturers such as Eaton, Parker-Hannifin, and Johnson Controls, whose hydraulics and electrical systems can enable hybrid vehicles and wind turbines—also may have considerable new sales opportunities.

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:

- Between 2004 and 2009, global investments in clean energy technology (including renewables, efficiency technologies, biofuels, carbon capture and sequestration (CCS), nuclear power, and other low-carbon technologies) grew at an average compound annual growth rate of 39 percent, reaching a peak of \$173 billion in 2008. Despite the recession, investment only fell 6.6 percent to \$162 billion in 2009.<sup>17</sup>
- Venture capital (VC) 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. While overall cleantech VC investment was down in 2009 due to the recession, as a percent of total VC investments, cleantech grew from 11.4 percent in 2008 to 12.5 percent in 2009, which represented the largest share in the history of the clean energy asset class.<sup>18</sup>

**Figure 2**

**Global New Investment in Clean Energy Technologies, 2004–2009**



Source: Pew Center on Global Climate Change, 2010. [http://www.pewclimate.org/docUploads/Clean\\_Energy\\_Update\\_Final.pdf](http://www.pewclimate.org/docUploads/Clean_Energy_Update_Final.pdf)

## Business Action on Climate

As of December 2010, 46 companies are members of the Pew Center's Business Environmental Leadership Council (BELC). These companies have combined revenues of over \$2.5 trillion, and together they employ nearly 4.5 million people.<sup>19</sup> They represent most industrial sectors and many of the largest GHG emitters, including utilities, mining companies, aluminum producers, automobile manufacturers, pulp and paper manufacturers, chemical companies, oil and gas businesses, and the cement industry.

Of the 46 companies, 35 have set targets to reduce their GHG emissions; in fact, many have already met initial targets and subsequently set new, more ambitious targets. The following are some of the many actions that BELC members have taken to reduce emissions while also reducing costs below those of their competitors and building new climate-related sales growth opportunities:

- In November 2010, **Air Products** set a new goal to reduce its global GHG emissions by 7 percent per production index by 2015. The company's production-intensity based emission reduction goal aligns with its 2015 intensity-based energy efficiency goals for large air separation units and hydrogen, carbon monoxide, and synthesis gas facilities. These plants represent approximately 80 percent of the company's total global energy requirements. Air Products intends to meet its GHG emissions reduction goal, investing in efficiency improvements at existing plants and new, high efficiency production facilities. The company expects to achieve a minimum energy reduction of 875 million kilowatt hours/year and 12 million MMBtu of natural gas at 2007 operating rates.<sup>20</sup>
- **Johnson Controls** is retrofitting the 80-year-old Empire State Building with the aim of reducing its energy use by 38 percent per year, placing it in the top 10 percent of all U.S. office buildings in terms of energy efficiency.<sup>21</sup>
- **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 past 20 years.<sup>22</sup> Indirectly, the company also helps other sectors and

companies reduce their energy use by supplying strong lightweight material that can substitute for heavier material—for example, in packaging where aluminum has significant transport benefits over heavier materials like glass. The search for light-weight materials will no doubt continue to grow as pressure for GHG reductions from transportation increases.

- As of September 2010, **Toyota** has sold nearly 2.8 million hybrids worldwide since the first Prius was introduced 13 years ago. In calendar year 2009, Toyota sold a combined 195,545 Toyota and Lexus gas-electric hybrids in the U.S. alone. In December 2009, Toyota launched the 2010 Prius Plug-in Hybrid Vehicle (PHV) demonstration program, which in North America will involve more than 150 PHVs placed in regional clusters with select partners for market/consumer analysis and technical demonstration.<sup>23</sup>
- Shipping giant **Maersk** announced in November 2010 that it is the first shipping company to receive independent verification of its CO<sub>2</sub> emissions data, vessel by vessel. The shipping line says it will now add the CO<sub>2</sub> data, verified by Lloyd's Register, as one of eight performance measures in score cards provided to its customers. This is expected to give Maersk's customers more transparency into the carbon footprint of their supply chains.<sup>24</sup>
- By the end of 2009, **Abbott Industries** had reduced CO<sub>2</sub> equivalent emissions from manufacturing by 36 percent compared with 2006 levels, normalized by sales, thereby exceeding its target of a 30 percent reduction by 2011. The company is achieving these reductions primarily by improving energy efficiency and switching to low carbon fuels and renewable energy. It generates electricity through co-generation at five of its manufacturing sites. In 2009, it also achieved a 32 percent reduction in electricity purchased, exceeding its 2011 target of a 12 percent reduction (on a 2006 baseline, indexed to sales).<sup>25</sup>

- In 2007, Citi and Bank of America announced separate environmental initiatives that include commitments to invest billions of dollars in alternative energy and clean technologies over the next decade.<sup>26</sup> Spurred by its 2005 commitment to environmental finance, by the end of 2009 Wells Fargo had made more than \$6 billion in loans and investments to environmentally beneficial initiatives which included wind farms and solar installations.<sup>27</sup> From 2003 to 2009, JP Morgan has provided financing of \$2.7 billion in renewable energy projects (primarily through tax equity financing) and raised another \$3.8 billion from other institutions for investment.<sup>28</sup>
- Investments in German-made renewable electricity-generating systems could be in the range of \$18 billion to over \$27 billion a year by 2020, with about \$15 billion coming from exports, and German companies could capture 15–20 percent of several global markets, particularly in component manufacturing for solar energy systems, wind turbines, and hydropower and biomass plants.<sup>35</sup>

While private funding from investors and corporations can help the United States compete in some of these technology markets, the United States cannot compete in other areas without greater government support for research, development, and deployment.

Businesses in energy, technology, and other sectors also are making substantial new investments of capital and effort to expand their climate-friendly products. General Electric (GE), for example, has doubled its annual investment in clean tech research and development to \$1.5 billion, resulting in a total investment of \$5 billion as of 2010.<sup>29</sup> (*Business Actions on Climate* on page 5 outlines other examples of leading companies transforming their businesses to succeed in a carbon-constrained world.)

### BUSINESS SUPPORT FOR STRONGER POLICY

The growing body of scientific evidence has clarified that climate change is already underway and that avoiding severe impacts in the future requires large reductions in human-induced CO<sub>2</sub> emissions in the coming decades.<sup>36</sup> Despite the 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.

While the figures above are significant, the absence of clear mandatory 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 and, increasingly, China.

Recognizing both that government action is inevitable and policy decisions made on this issue could have substantial implications for future profits, business leaders have increasingly engaged with policymakers to help influence those decisions. Many businesses 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 emissions trading, that give businesses flexibility either to reduce their own GHG 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).

- Europe invested more than \$41 billion in clean energy technologies in 2009, followed by China with \$34.6 billion and the United States as a distant third with \$18.6 billion.<sup>30</sup>
- U.S. firms face serious competition in the wind and solar power sectors. In 2008, while GE had an 18 percent share of the global installed wind turbine market and 43 percent of the domestic market, it was the only U.S. company among the top five global wind turbine manufacturers.<sup>31</sup> The story is similar in other industries; only one of the top 10 solar panel manufacturers is American, as are only two of the top 10 advanced battery manufacturers.<sup>32</sup>
- China is now home to the world's largest solar panel manufacturing industry—which exports about 95 percent of its production to countries including the United States.<sup>33</sup> China also manufactures more wind turbines than any other country.<sup>34</sup>

The emergence of the U.S. Climate Action Partnership (USCAP), a coalition of major corporations and non-governmental organizations—including the Pew Center on Global Climate Change—which called for the prompt establishment of a binding domestic cap on emissions, was perhaps the most dramatic example of positive business engagement on the climate issue in recent years. The coalition publicly unveiled its “Call for Action” in January of 2007 and followed up with its more detailed “Blueprint for Legislative Action” in January 2009, which urged the adoption of a market-driven,

economy-wide approach to reducing GHG emissions 80 percent below 2005 levels by 2050.<sup>37</sup>

An important reason why many corporations support a move to federal regulation is the specter of complying with a growing patchwork of state and regional climate 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.<sup>38</sup>

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

Calls for changes in national policies are coming from a diverse array of businesses—automobiles, chemicals, heavy and high-tech manufacturing, medical products, retail, information technology, and major oil and gas companies. In addition to USCAP, recent examples of businesses advocating for mandatory climate policy include:

- In June of 2009, more than 40 large companies, including Alcoa, American Electric Power, Dow, Duke Energy, GE, John Deere, HP, NRG, National Grid, PSEG, PG&E, Rio Tinto aligned with environmental, labor, and religious organizations to publicly support the passage of the Waxman-Markey American Climate and Energy Security Act, a bill that would have established a mandatory domestic GHG reduction program.
- In early 2010, more than 70 companies with over \$2.5 trillion in revenue, including all of USCAP and others such as Google and Nike, as well as 25 labor unions and NGOs joined together in an ad campaign supporting bi-partisan, comprehensive energy and climate legislation. The ad ([www.climatead.org](http://www.climatead.org)) ran under the banner “A Question of American Leadership” and in *The Washington Post*, *The Wall Street Journal*, *POLITICO*, and a number of state newspapers.

- American Businesses for Clean Energy (ABCE) gathered together the names of 5,200 small- and medium-sized businesses that support Congressional enactment of clean energy and climate legislation that will significantly reduce GHG emissions.
- Business for Innovative Climate & Energy Policy (BICEP) is a group of 18 mostly consumer products and retail companies, including Best Buy, Nike, Starbucks and Target, that has called for climate and energy legislation that reduces GHG emissions 25 percent by 2020 and 80 percent by 2050.

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 are seeking coordinated global policies that will be as predictable, integrated, and consistent as possible. Many corporations operate in countries that have committed to emissions reductions under the Kyoto Protocol, and for these companies, it makes sense to implement company-wide climate change strategies, rather than operate with varying requirements across the globe. Firms 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 to encourage China and India to move toward climate commitments is for the United States to adopt its own mandatory emissions limits and 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 GHG 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.

While business action on climate has grown over the last several years, some concerns have been raised that the recent economic turmoil may dampen business and government support for addressing climate change. Pessimists fear that

tighter credit markets could slow financing for renewable energy projects, cash-strapped consumers may pull back from paying premiums on “greener” goods, and deteriorating macroeconomic conditions could distract policymakers from putting in place new regulations designed to limit emissions of GHGs, for example.

Despite these concerns, there are encouraging signs the climate issue will stay near the top of corporate and government agendas through this period of global economic anxiety. Governments are continuing efforts at the state, federal and international levels aimed at reducing GHG emissions, and companies continue to announce new, ambitious voluntary GHG reduction targets.<sup>39</sup> Increasingly, leading companies recognize that environmental protection and economic prosperity are not competing ideals but are in fact dependent on one another. And many analysts have noted the potential for government and private sector investment in clean energy to serve as a powerful economic stimulus tool for the U.S. and other countries around the world.

The 95 companies and other organizations that came together in the first half of 2010 on the “American Leadership Ad” understood this message, as they said: “We believe it’s time for Democrats and Republicans to unite behind bi-partisan, national energy and climate legislation that increases our security and limits emissions, as it preserves and creates jobs. It’s a question of American leadership.”

Still, long-term efforts to address climate change will not be cost free—but voluntary action by companies, such as those in the Pew Center’s BELC, proves 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 that significant emissions reductions with minimal impact on the U.S. economy can be achieved. 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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