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## *The Economic Case for Climate Action*

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### ***OVERVIEW<sup>1</sup>***

This paper describes how investing in climate protection is good for business. It describes ways that intelligent uses of market mechanisms can solve the climate crisis not at a cost but as an investment in a far better future for all of the world's people. The paper describes how this future is rapidly emerging despite restrictions at every turn.

## **Introduction**

*Climate change represents a unique challenge for economics: it is the greatest and widest-ranging market failure ever seen – Sir Nicholas Stern<sup>2</sup>*

*Creating the low-carbon economy will lead to the greatest economic boom in the U.S. since we mobilized for World War II – Former President Bill Clinton<sup>3</sup>*

Sir Nicholas Stern and Bill Clinton both have it right. Global climate change has been our greatest market failure. Now it is our greatest market opportunity. There is a strong business case for solving climate change.

Mitigating greenhouse gas emissions worldwide will require a crash program to use energy more efficiently, and to switch to renewable energy sources. Sir Nicholas Stern, less than a year after releasing his report, stated that climate change is happening faster than had previously been thought, and that emissions need to be reduced sharply and rapidly.<sup>4</sup> The good news is that more efficient use of energy and renewable energy is growing rapidly, and that transforming our economy to reduce carbon emissions in line with what scientists say is needed,<sup>5</sup> will cut costs, drive competitiveness, create jobs and stimulate prosperity.

## ***The Opportunity of the New Energy Economy***

As economic conditions drive companies to cut costs, smart managers are realizing that energy efficiency is one of the best places to start. Historically, energy costs were believed to be small, fixed expenses. One client company instituted a simple policy: across their 26 facilities, employees were asked to shut off their 7,000 computers and monitors when the equipment was not in use. That one measure saved \$683,000 the first year. No one had asked just how much energy the devices were using. The 2009 PC Energy report found that shutting off unused American PCs would save \$2.8 billion a year.<sup>6</sup> Such measures have no capital cost. The savings can then be banked to capitalize progressively more ambitious efficiency measures. Not only can investments in energy savings deliver some of the highest rates of return in the entire economy, but this stream of savings can be leveraged to achieve ongoing savings.

- Twenty U.S. states, over two thirds of the United States economy and population, are implementing comprehensive, multi- sector greenhouse gas reduction plans. Such programs will expand employment, income and investment, contribute to national economic recovery, while achieving net savings of at least \$85 billion in 2020; and from 2009 to 2020 cumulative savings of \$535.5 billion. The programs will also deliver such co-benefits as energy independence, enhanced health and environmental protection.<sup>7</sup>
- Renewable energy and energy efficiency industries currently generate about 8.5 million green collar jobs and almost \$1 trillion in revenue. The number could increase to 40 million jobs and \$4.5 trillion in revenues “with the appropriate public policy, including a renewable portfolio standard, renewable energy incentives, public education and research and development.”<sup>8</sup> In the week that these numbers were released, General Electric Power Generation announced it would invest \$39 million and hire 500 workers for a renewable energy division expansion in upstate New York.<sup>9</sup> In 2008, renewable energy and energy efficiency (RE&EE) industries generated \$10.3 billion in sales and over 91,000 jobs in Colorado.<sup>10</sup>
- In 2008 over a seven-month period, the City of San Francisco created 180 new jobs by enabling 640 residents and enterprises to install 2 MW in small rooftop solar electric systems. Workforce trainees filled 83% of the jobs. The City’s SF Energy Watch helped 1,500 businesses and multifamily properties save over \$5.7 million in energy bills, delivering 6 megawatts of energy efficiency savings.<sup>11</sup>
- The opportunity is even larger in developing countries. More than \$300 billion will be needed worldwide over the next 20 years to provide low-carbon electric power and equipment to the 1 billion people who now do not yet have access to electricity.<sup>12</sup> The World Bank estimates that an investment of up to \$40 billion annually will be needed worldwide to adapt to climate change. Meeting those needs with renewable energy and energy efficiency will create ten times more jobs than building fossil fuel power plants.<sup>13</sup> Doing this will also better enhance national economies and strengthen poverty alleviation efforts.<sup>14</sup>
- Renewables are the fastest growing energy supply worldwide, and are, in many cases, even cheaper than conventional supply. Solar thermal is leading the charge, outpacing all conventional energy supply technologies. Modern wind machines come second, delivering over 8 gigawatts of new power to the U.S. in 2008,<sup>15</sup> or more new power than nuclear added

worldwide each year at its peak in the 1970's. Estimates by the U.S. Secretary of Interior show that offshore wind potential could more than meet all U.S. demands for electricity.<sup>16</sup> The third fast growing technology is solar electric, adding almost six gigawatts of new capacity in 2008 worldwide.<sup>17</sup>

- Clean technology investments set another record in 2008, despite the economic collapse. In North America, Europe, China and India lean technology venture investments totaled a record \$8.4 billion, up 38% from \$6.1 billion in 2007, the seventh consecutive year of growth in venture investing.<sup>18</sup> A 2007 survey of 19 venture capitalists investing in 57 European clean tech firms showed average annual returns since 1999 of almost 87%.<sup>19</sup> Returns dropped precipitously in the 2008 crash, but are expected to rebound as financing becomes available. Calling climate change “one of the most pressing global challenges,” venture capitalist John Doerr predicted that the resulting demand for innovation would create the “mother of all markets.”<sup>20</sup> Investment in renewable energy projects market could reach \$50 billion by 2011, with double-digit annual growth rates.<sup>21</sup> The United Nations described “A gold rush of new investment into renewable power,” concluding that clean energy could provide almost a quarter of the world's electricity by 2030.<sup>22</sup> The European Renewable Energy Council (EREC) was even more optimistic, claiming that 50% of the world's energy supply can come from renewable energy sources by 2040.<sup>23</sup>
- In 2007, the U.S renewable energy and energy efficiency industries generated over a trillion dollars in sales and created over 9 million jobs, representing substantially more than the combined 2007 sales of the three largest U.S. corporations—Wal-Mart, ExxonMobil, and GM (\$905 billion). If the federal stimulus policies are implemented, these industries could generate over 37 million jobs per year in the U.S. by 2030.<sup>24</sup>
- Investing in new transit infrastructure to help Americans achieve the access that they seek without having to rely on private automobiles by will cut carbon emissions, create jobs, and foster urban revitalization. There were 700 million “light duty vehicles” worldwide in 2000, expected to increase to 1.3 billion in 2030 and more than 2 billion by 2050.<sup>25</sup> Better urban design, mass transit and vehicle efficiency are all needed to prevent massive increases in transport-related carbon emissions and urban gridlock. Transportation America estimates that building needed transit systems in 78 U.S. metro areas will generate 6.7 million jobs and save citizens billions of dollars annually. The typical American family spends 19% of

household income on transportation. Effective mass transit could return 1-15% of this income to citizens. Portland, Oregon estimates that its recent mass transit investments save its citizens \$2.6 billion annually.<sup>26</sup>

- In December 2006, Mayor Michael Bloomberg announced PLANYC 2030 to create affordable and sustainable homes for nearly one million New Yorkers, ensure that all residents live near a park, add public transit capacity for millions more commuters, upgrade energy infrastructure and achieve “the cleanest air of any big city in America”—all while reducing the city’s greenhouse gas emissions by 30%.<sup>27</sup>
- Replacing the 85 million barrels of petroleum the world consumes each day, the 385 million gallons of gasoline burned daily in the United States<sup>28</sup> and the much higher fuel consumption projected for the future will require whole new industries. Between 2000 and 2005 production of biofuels grew globally by 95% and should account for 5% of transport fuels by 2020. By 2015, this could create more than 200,000 new U.S. jobs in ethanol production alone.<sup>29</sup> In contrast, the high oil prices of mid-2008 represented one of the biggest transfers of wealth in history, redistributing 1% of world GDP each year. Oil consumers paid \$5 billion more for oil every day than they did 5 years before. In 2007, \$2 trillion flowed from customers to the oil companies and oil-producing nations.<sup>30</sup>

For years, the United States led the world in development of “green” technologies including solar technologies and wind turbines. Today, such countries as Japan, Germany, Spain, and Denmark lead in solar and wind power. In Germany, renewables generate more new jobs than any other industry,<sup>31</sup> creating 250,000 jobs in the renewable energy sector and 1.8 million jobs in environmental protection. The number of jobs in renewables is projected to more than triple by 2020, hitting 900,000 by 2030. The German Deputy Environment Minister stated, “Investments in climate protection can help us get out of this crisis faster.” The German government aims to reduce its emissions of carbon dioxide by 40% from 1990 levels by 2020. The renewable energy sector aims to triple its share of power generation to 47% by 2020, from 15.1% in 2008.<sup>32</sup>

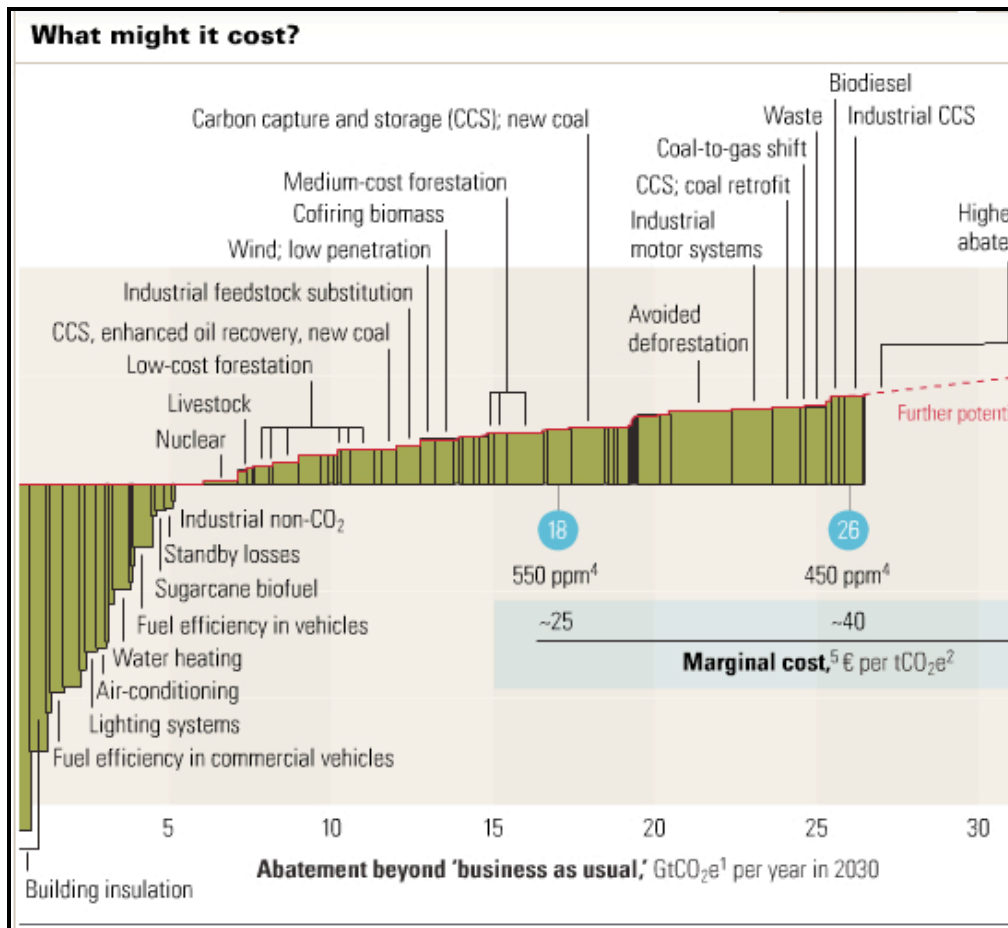
The Germans are not alone. Denmark aims to get 60% of its energy from renewables by 2010. Japan was first-to-market with hybrid vehicles, enabling Toyota to surpass General Motors as the world largest car company in 2008. It expects hybrid vehicles to rise from 6% of its U.S. vehicle sales in 2005 to 20% by 2012.<sup>33</sup>

If United States wishes to retain its position as world leader it will put a priority on developing the goods and services needed for low-carbon economic development worldwide.

### ***The Economics of Climate Protection***

The 2007 McKinsey study (See Figure 1) is one of a growing number of studies finding that climate challenge can be met at little or even negative cost.

Figure 1 A Cost Curve For Greenhouse Gas Reduction<sup>34</sup>



The McKinsey study found it cost effective to cut greenhouse gas emissions on the scale that scientists say will be necessary to protect the climate. Importantly, the study finds that this can be achieved at less than the world spends on defense or insurance, and approximately a third of the collective impact of 2007 oil price rises.<sup>35</sup> Although individual assumptions can be questioned (McKinsey uses historic nuclear costs, not the much higher marginal costs of building new plants, it assumes that carbon capture and sequestration of emissions from new coal plants will

be cheap, while it is more likely that it will double the cost of coal) the shape of the graph is roughly correct. The savings from energy efficiency, which can cut energy use by at least half, will roughly pay for the additional supply needed to offset carbon emissions.

“This is a hugely important message to policy makers everywhere, not least those in the United States Congress,” the New York Times editorialized in May 2007. “Many of them have been paralyzed by fears...that a full-scale attack on climate change could cripple the economy.”<sup>36</sup>

The truth is quite the contrary, having already suffered a “full-scale attack on the economy,” the only way out of the current mess seems to be precisely to implement the measures that will protect the climate.

Community leaders agree. Over 900 American Mayors pledged their cities to meet the goals set forth in the Kyoto Protocol or reduce their emissions of greenhouse gasses by at least 7% by 2012.<sup>37</sup> Some have already met even more aggressive targets, ranging from a goal of 20% reduction by Portland to a goal of 42% reduction over the same time frame by Sebastopol, California.<sup>38</sup> Communities and companies that are implementing climate protection programs are finding that smart, comprehensive approaches to climate planning make them more competitive and put hundreds of billions of dollars back into the economy from savings.

In the world’s sixth largest economy, Californians have held their energy consumption to zero growth since 1974 while national per capita energy consumption grew 50%. This has enabled the average family there to pay about \$800 less for energy each year than had the state not pursued energy efficiency.<sup>39</sup> In 2004, California ranked 12<sup>th</sup> in the nation in energy prices, but only 45<sup>th</sup> in energy costs per person.<sup>40</sup> A 2008 Study by the University of California found that California’s programs to reduce energy dependence and increase energy productivity three decades ago directed a greater percentage of its consumption to in-state, employment-intensive goods and services whose supply chains largely reside within the state. This created a strong “multiplier” effect of job creation, generating 1.5 million FTE jobs with a total payroll of over \$45 billion, saving California consumers over \$56 billion in energy costs. Going forward, achieving 100% of the greenhouse gas emission reduction targets mandated by California’s AB

32, a cap on emissions by 2020, would increase the Gross State Product by \$76 billion, increase real household incomes by \$48 million, and create as many as 403,000 new efficiency and climate action jobs.<sup>41</sup>

Programs to help buildings use less energy and encourage the use of efficient cars, appliances and machines stimulate new manufacturing ventures, increase farm income, and generate increased community income. A local government Commissioner from Portland, Oregon, stated, “We've found that our climate change policies have been the best economic development strategy we've ever had. Not only are we saving billions of dollars on energy, we are also generating hundreds of new sustainable enterprises as a result.” A 2003 study of the impact of energy efficiency and renewables in Oregon found that one average megawatt saved increases:

- annual economic output in Oregon by \$2,230,572;
- wage income in Oregon by \$684,536; and
- business income by \$125,882.

Each average megawatt saved creates 22 new jobs in Oregon. The study found that over 12 megawatts were saved as a result of Energy Trust program activities in 2002, with the number growing to 125 average megawatts by 2006.<sup>42</sup>

### ***The Business Role In Climate Protection***

Many corporations understand that climate protection will enhance their bottom line. DuPont, GE, Alcoa, Caterpillar, PG&E, Chrysler, Johnson & Johnson, PepsiCo and others, acting as members of the U.S. Climate Action Partnership, or USCAP,<sup>43</sup> have called for national legislation to cap carbon emissions, stating, “In our view, the climate change challenge will create more economic opportunities than risks for the U.S. economy.”<sup>44</sup>

DuPont pledged in 1999 to reduce its emissions of GHG 65% below its 1990 levels by 2010, and to get 10% of its energy and 25% of its feedstocks from renewables, making this announcement in the name of increasing shareholder value. DuPont delivered on that promise: the value of DuPont stock increased 340% as the company reduced global emission reductions 67% for a

savings between 2000 and 2005 of \$3 billion.<sup>45</sup> DuPont's climate protection program demonstrated that it costs less to implement the energy savings measures than it does to buy and burn the fuel. In 1999, the Company estimated that every ton of carbon it displaced saved it \$6. In 2007 DuPont's efforts to squeeze out waste were saving the company \$2.2 billion a year. The company's profits were \$2.2 billion a year.<sup>46</sup>

ST Microelectronics pledged to become carbon neutral (zero net CO<sub>2</sub> emissions) by 2010 with a 40-fold increase in production. Figuring out how to do this drove the company's innovation, taking it from the number-twelve microchip manufacturer in the world to the number-six. ST gained market share, won awards and reckons it will save almost a billion dollars by the time it meets its goal.

In December 2004, Chicago Climate Exchange (CCX) the world's biggest and the U.S.' only voluntary cap-and-trade system, began trading carbon in a country where no law mandated it. Inaugural members DuPont, ST, Baxter Health Care, the City of Chicago and 13 other businesses who voluntarily contracted to reduce their emissions by 2% a year. If they reduced emissions even further, they created tradable Carbon Financial Instruments (CFI's), which they could sell to such members as World Resources Institute or Natural Capitalism Solutions who wished to become carbon neutral. CCX's 440 members' collective baseline is now over 600 million metric tons (mmt), larger than the emissions from Germany in the mandatory EU program. CCX members, have already cut their emissions eight percent. CCX members represent 17% of U.S. stationary emissions, 20% of the power sector, and 20% of the Dow Jones industrials.

Partnering with the China National Petroleum Corporation (Petro China) and the city of Tianjin, CCX opened the Tianjin Climate Exchange in Tianjin, China in fall 2008. The India Climate Exchange has gathered 20 members to establish a private cap-and-trade in India. CCX also is partnered with the European Climate Exchange, which now trades 85% of the European Trading System (ETS) futures market.

In 2006, the world's largest retailer, Wal-Mart, announced goals to reduce energy use at its stores 30% over three years, double the fleet efficiency of its vehicle fleet, build hybrid-electric long-haul trucks, and ultimately become carbon neutral, 100% powered by renewable energy. The company calculates that its campaign to sell 100 million CFLs in 2007 saved its customers as much as \$3 billion.<sup>47</sup> Wal-Mart realized that replacing the incandescent bulbs in its own ceiling fan displays with compact fluorescent blubs throughout its 3,230 stores (10 models of ceiling fans on display, each with four bulbs. Forty bulbs per store, 3,230 stores) could save the company \$6 million a year. Chuck Kerby, the Wal-Mart employee who did the math, reflected, "That, for me, was an 'I got it' moment."<sup>48</sup>

### ***Maximizing the Integrated Bottom Line***

Businesses that reduce their carbon emissions strengthen every aspect of shareholder value. Shareholder value is enhanced when a company cuts its costs, grows top-line sales, better manages its risks, enhances labor productivity, drives innovation, better manages its supply chains and stakeholders, etc. This Integrated Bottom Line approach<sup>49</sup> shows that companies that implement climate protection programs not only reduce expenses now, but also position themselves for long-term performance.<sup>50</sup> Over time, climate protection programs enhance core business value by delivering sector performance leadership and first-mover advantage. Companies gain greater access to capital, improve corporate governance, strengthen their ability to drive innovation, and improve government relations. Ultimately, the business enhances its reputation and brand equity. This increases a company's ability to attract and retain the best talent, increase employee productivity and health, improve communication, creativity, and morale in the workplace, and strengthen stakeholder relations.

These conclusions are borne out by the 2007 report from Goldman Sachs, showing that companies that are leaders in environmental, social and good governance policies outperformed the MSCI world index of stocks by 25% since 2005. Seventy two percent of the companies on the list outperformed industry peers,<sup>51</sup> were financially healthier and achieved enduring value.<sup>52</sup>

Regardless of how severe the economic collapse proves to be, companies that make a serious commitment to behave in more sustainable ways will emerge as leaders. *Green Winners*, an AT Kearney analysis, tracked the 2008 stock price performance over six months of 99 firms on Dow Jones Sustainability Index and the Goldman Sachs list of green companies. In 16 of 18 industries, businesses deemed “sustainability focused” outperformed industry peers over three- and six-month periods and were “well protected from value erosion.” From September through November the performance differential across the 99 firms tracked was 10%; over six months, it was 15%. “This performance differential,” the Report stated, “translates to an average of \$650 million in market capitalization per company.”<sup>53</sup>

### ***Risk Management***

Tolerating wasteful energy use and carbon emissions is a high-risk strategy for a company. Volatility of energy supply and increasing prices, geopolitical volatility, threats to business from extreme weather events, the risk of liability claims for failing to manage carbon all make carbon reduction simply better business.

The FTSE Index, the British equivalent of Dow Jones, states, “The impact of climate change is likely to have an increasing influence on the economic value of companies, both directly, and through new regulatory frameworks. Investors, governments and society in general expect companies to identify and reduce their climate change risks and impacts, and also to identify and develop related business opportunities.”<sup>54</sup>

### ***Insurance***

In 2003 the Wall Street Journal reported that the second largest re-insurance firm, Swiss Re, “has announced that it is considering denying coverage, starting with directors and officers liability policies, to companies it decides aren’t managing their output of greenhouse gases.”<sup>55</sup> The prescience of this statement came clear as claims from weather related disasters rose twice as fast as those from all other mishaps.<sup>56</sup> 2008 was the third worst year on record for loss-producing events, with losses jumping from \$82 billion in 2007 to over \$200 billion, with more than

220,000 dead. The all time record remains 2005 with \$232 billion in insured losses, with costs now growing 10 times faster than premiums, the population, or economic growth.<sup>57</sup>

In 2007, the Washington Post reported that, “Nervous investors have begun asking similar questions of the insurers, asking them to disclose their strategies for dealing with global warming. At a meeting of the National Association of Insurance Commissioners, Andrew Logan, insurance director of the investor coalition, representing \$4 trillion in market capital, warned that ‘insurance as we know it is threatened by a perfect storm of rising weather losses, rising global temperatures and more Americans living in harm’s way.’”<sup>58</sup> John Dutton, Dean Emeritus of Penn State’s College of Earth and Mineral Sciences, estimated that \$2.7 trillion of the \$10-trillion-a-year U.S. economy is susceptible to weather-related loss of revenue, increasing companies’ off-balance-sheet risks.<sup>59</sup>

Property owners are suffering price shocks and reduced availability of coverage. Highly vulnerable properties such as offshore oil platforms have seen insurance rates rise 400% in one year.<sup>60</sup> Homeowner premiums have risen 20 to 40% in many areas, if they can be obtained at all.<sup>61</sup> Insurers have withdrawn coverage for hundreds of thousands of homeowners in Florida, Louisiana, Mississippi, New York, Massachusetts, Rhode Island, and South Carolina.<sup>62</sup>

### ***Access to capital***

Investors have begun evaluating the corporate role in climate change. Large institutional investors are conducting shareholder campaigns that urge companies to disclose climate risk and implement mitigation programs.<sup>63</sup>

The Investor Network on Climate Risk<sup>64</sup> includes over 50 institutional investors collectively managing more than \$3 trillion in assets. A group of 28 leading institutional investors from the United States and Europe,<sup>65</sup> managing over \$3 trillion in assets, announced a 10-point action plan that calls on investors, leading financial institutions, businesses, and governments to address climate risk and seize investment opportunities. U.S. companies, Wall Street firms, and the Securities and Exchange Commission (SEC) are asked to provide investors with comprehensive

analysis and disclosure about the financial risks presented by climate change. The group pledged to invest \$1 billion in prudent business opportunities emerging from the drive to reduce GHG emissions.

In the United States, the Sarbanes-Oxley Act<sup>66</sup> makes it a criminal offense for the Board of Directors of a company to fail to disclose information, including such environmental liabilities as carbon emissions that could alter a reasonable investor's view of the organization. In France, Holland, Germany<sup>67</sup> and Norway, companies are already required to report their GHG emissions.

Even as early as 2005, such investor intervention and persuasion contributed to decisions by a number of large companies (Anadarko Petroleum, Apache, Chevron, Cinergy, DTE Energy, Duke Energy, First Energy, Ford Motor Company, General Electric, JP Morgan Chase, and Progress Energy) to make new commitments such as supporting mandatory limits on green house gasses, voluntarily reducing their emissions, or disclosing climate risk information to investors.<sup>68</sup>

Since 2002 the British NGO, the Carbon Disclosure Project (CDP), has surveyed the Financial Times 500, the largest companies in the world. Initially, only 10% of the recipients answered. In 2005, 60% did so. In 2007, 77% completed the survey. Ford Motor Company produced a major report detailing its emissions. Why the change? The threat of Sarbanes Oxley liability clearly played a role. But perhaps more significantly, the Carbon Disclosure Project represents institutional investors with assets of over \$50 trillion, now representing almost a third of all global institutional investor assets. A company that might want to go to the capital markets would be advised to answer the survey.

The 2007 CDP report found that the world's major companies are increasingly focused on climate change and that many see it as an opportunity for profit. Nearly 80% of respondents around the world considered climate change a commercial risk, citing extreme weather events and tightening government regulations. Some 82% said that they recognized commercial opportunities for existing or new products, such as investments in renewable energy. Globally, 76% said they had instituted targets and plans to reduce emissions. But only 29% of U.S.

respondents had implemented greenhouse gas reduction programs with timelines and specific targets.

The banking industry is reducing its own carbon footprint. In 2006, HSBC won the Financial Times' first Sustainable Banking Award by becoming carbon neutral. It provided financing for renewable energy companies, and purchased renewable energy to cover its operations.<sup>69</sup> In 2007, JPMorgan Chase and the Socially Responsible Investment advisors, Innovest, announced the creation of the JPMorgan Environmental Index—Carbon Beta (JENI-Carbon Beta), the first high-grade corporate bond index designed to address the risks of global warming by tracking carbon footprint of companies. “Taking into account environmental and social issues isn't just about good corporate citizenship, its becoming an essential part of risk management for investors,”<sup>70</sup> In addition to reducing its own carbon emissions, the firm raised \$1.5 billion of equity for the wind power market in 2006, making investments in renewable energy totaling \$1 billion. Citigroup Inc., Deutsche Bank AG, UBS AG, and ABN Amro also committed \$1 billion to finance the energy savings measures in municipal buildings in such cities as New York, Chicago, Houston, Toronto, Mexico City, London, Berlin, Tokyo, Rome; Delhi, Karachi, Seoul, Bangkok, Melbourne, Sao Paolo, and Johannesburg.<sup>71</sup>

Goldman Sachs, Credit Suisse, Citigroup and others created clean-energy investment funds, and pledged to purchase more products locally.<sup>72</sup> “Wall Street is waking up to climate change risks and opportunities,” stated Carbon Disclosure Project Chair, James Cameron. “Considerably more of the world’s largest corporations are getting a handle on what climate change means for their business and what they need to do to capture opportunities and mitigate risks. This all points to a continued elevation of climate change as a critical shareholder value issue.”<sup>73</sup>

### ***Managing the Supply Chain***

In a global marketplace the threat of more frequent and more violent storms is a challenge to companies that depend on products shipped from around the world. Wal-Mart is measuring the amount of energy that it takes various suppliers to make and transport the products sold in its stores. Wal-Mart has changed its business model to work with suppliers of such products as

DVDs, toothpaste, soap, milk, beer, vacuum cleaners, and soda to help them reduce their carbon footprint.<sup>74</sup> Wal-Mart hired the Carbon Disclosure Project to survey factories in China that are manufacturing products for the company. “This is an opportunity to spur innovation and efficiency throughout our supply chain that will not only help protect the environment but save people money at the same time,” said Wal-Mart's Chief Merchandising Officer John Fleming.<sup>75</sup>

### ***Labor Productivity***

Inefficient use of energy in buildings causes most of American greenhouse gas emissions, but it also costs companies lost productivity. Bad air quality from inefficient air handling causes what is called “sick building syndrome,” affecting 2% of workers nationwide, at a cost of almost \$60 billion.<sup>76</sup>

Energy efficiency measures like better lighting that helps workers see better, can cut electricity use four-fold and increase labor productivity by six to 16%.<sup>77</sup> Labor costs are typically 100 times greater than energy cost, so even a one percent increase in labor productivity will dwarf the energy savings, but attention to meeting energy needs in smarter ways makes possible the enhanced productivity. Improved worker productivity from these green building features could deliver savings of \$20 to \$200 billion a year.<sup>78</sup>

Lockheed’s Building 157 in Sunnyvale, CA, achieved a 75% reduction in lighting energy, saving \$500,000 a year worth of energy, with a four-year payback. The better lighting and the other green features led to a 15% drop in employee absenteeism, and a productivity increase of the same amount. This enabled the company to win a new contract, the profits of which paid for the costs of the entire building.

Boeing implemented a lighting retrofit that cut lighting energy costs by 90% with less than 2-year payback (a 70% return on investment). Because the workers could see better, the error rate went down by 20%—very good news for everyone who flies around on airplanes. It also increased on-time delivery and customer satisfaction.

### ***Small Businesses and Climate Protection***

Small businesses are the economic engine of the country, generating more than half of non-farm private gross domestic product. They represent 99.7% of all employer firms, employing nearly 60 million workers, about half of all private employees. For the past decade they have generated 60 to 80% of net new jobs each year.<sup>79</sup>

*Business Week* pointed out that the 25 million small businesses in the United States stand to be among the hardest-hit victims of climate change.<sup>80</sup> According to the Institute for Business and Home Safety, at least one-fourth of the small businesses closed by natural disasters never reopen.<sup>81</sup> Small businesses will be least prepared to deal with increased government regulation if a mandatory program to reduce greenhouse gas emissions is implemented.

Small businesses consume half the electricity in the country, but only about a third have invested in energy efficiency. Natural Capitalism's web-based learning platform, Solutions at the Speed of Business, shows companies how they can enhance profitability by cutting carbon emissions, cutting their costs, and increasing sales to others who are implementing emissions reduction programs.<sup>82</sup> As *Business Week* noted, "reducing energy waste in U.S. homes, shops, offices, and other buildings must, of necessity, rely on tens of thousands of small concerns that design, make, sell, install, and service energy-efficient appliances, lighting products, heating, air-conditioning, and other equipment. Small businesses can also save as much as 20-30% on their own energy bills by making their own workplace more energy-efficient."<sup>83</sup>

Energy efficiency and renewable energy can enable small businesses to become more energy self-reliant. Every year, American businesses lose billions of dollars when blackouts, power surges and other interruptions force them to shut down. In August, 2003, a tree branch fell across a power line in Ohio, setting off a cascading failure that blacked out the Northeast for 30 hours. The Wall Street Journal estimated the cost to the region at \$6 billion. Two thirds of business lost at least a day of operation with a quarter losing more than \$50,000 an hour.

Harbec Plastics, a small upstate New York injection molding company, had recently completed a comprehensive energy efficiency program, including a lighting retrofit, and installation of more

efficient motors to avoid periodic power surges and outages that lost production time, wasted materials and impacted customer relations. Harbec added renewable energy, including a wind turbine and photovoltaics, as well as a combined heat and power system to cut its soaring energy bill.

Even before the 2003 blackout, Harbec's energy efficiency and new power supply cut its costs and dramatically reduced temperatures on the shop floor, improving working conditions. Being able to operate throughout the blackout, generated profits that paid off the capital cost of the new energy investment. The company took the lessons to heart and now produces its own biodiesel and uses fuel-efficient vehicles. By reducing energy costs, the leading reason that businesses are fleeing New York, Harbec preserved jobs in an economic downturn and created new business opportunities.<sup>84</sup>

## ***Conclusion***

Climate protection has been presented as a moral argument. Business leader Ray Anderson<sup>85</sup> asks:

When you meet your Maker, what will your conversation be about?

Will you describe your rate of return? Or how you enhanced shareholder value?

Or will you discuss what you did to leave a legacy for future generations?

The way most companies do business, the way that most communities operate, and the way that most of us live is leaving a legacy of an environmentally and financially impoverished planet.

We can, we must do better.

If we fail to act, there will come a time when the children who are young today will ask us, "You were there then when there was still time to act. What did you do?" How will you answer?

There is also a very strong business case for acting now, and acting aggressively to cut carbon emissions and unleash the new energy economy. As the world economy hovers between

depression and opportunity, doubters argue that we can't afford climate protection. Tom Friedman, New York Times columnist stated, "When I hear people say we can't afford to be green, that's utter lunacy. We can't afford not to be green. Because the next great pool of manufacturing jobs are going to be green smart jobs. Mom, Dad, tell your kids, anything green is going to have a good upper middle class job associated with it."

The shift from fossil energy to low-carbon fuels will leave a fine legacy for future generations. But it will also drive wealth creation and stimulate the economy today. Companies and communities are cutting their costs, creating jobs, increasing profits and strengthening shareholder value by implementing new energy strategies. Unleashing the new energy economy will require capital, but dramatically less investment than any other way of meeting our energy needs. The jobs being created in our communities use the sorts of skills that Americans have. Small businesses will play an important role, as cities and households use energy more productively and turn to renewable sources. A transformation of the U.S. economy is underway.

Are you a part of it?

## END NOTES

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<sup>1</sup> This paper draws extensively on the *Climate Protection Manual for Cities* (<http://www.climatemanual.org/Cities/Chapter1/index.htm>) see, especially “Climate Change: Why Act Now.” Grateful acknowledgement to peer reviewers Lyle Casriel, Bill Becker, Michael Northrup, Ray Anderson, David Overton and the staff of Natural Capitalism Solutions.

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