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CHAPTER 2:
Why Act Now
The Business Case for Protecting the Climate

DOCUMENT CONTENTS

This is the second of three sections. Drivers of Change and Risk Mitigation are the other two. See: www.climatemanual.org

The Business Case for Protecting the Climate

Consumers' desire for a healthier, more sustainable world has driven even mainstream institutions to make major changes. Perhaps most exciting, the business community is joining the effort to reduce global warming and to implement more sustainable practices.

In May 2005, Jeffrey Immelt, the man who replaced Jack Welch at the helm of General Electric (GE), stood with Jonathan Lash, the President of World Resources Institute (WRI), a leading environmental organization, to announce the creation of GE Ecomagination. The two co-authored an article in *The Washington Post* titled, "The Courage to Develop Clean Energy."[1]

Immelt committed GE, the sixth largest company in the world, and the only company that would have been on the Fortune 500 list if it had existed in 1900 and is still on it today, to implement aggressive plans to reduce emission of GHGs, spending $1.5 billion a year on research in cleaner technologies. As part of the initiative, Immelt promised to double GE's investment in environmental technologies to $1.5 billion by 2010, and reduce the company's GHG emissions by 1% by 2012. Without any action, GE's emissions would have gone up 40%.[2]

GE's announcement was rapidly followed by an even more significant environmental commitment from Wal-Mart, now considered the largest company in the world. In 2006, Lee Scott, the CEO of Wal-Mart, announced that his company would undertake a major effort to reduce its emissions of GHGs. He set a goal of supplying his stores with 100% renewable energy. Wal-Mart is experimenting with green roofs and green energy (which is now used to power four Canadian stores, for a total of 39,000 megawatts—the single biggest purchase of renewable energy in Canadian history). The company pledged to become the largest organic retailer and to increase the efficiency of its vehicle fleet by 25% over the next three years. It will eliminate 30% of the energy used in store and invest $500 million in sustainability projects.[3]

An unabashedly astonished article in the *San Francisco Bay Guardian* reflected:

> Wal-Mart's rationale for all of this, of course, has absolutely zero to do with any sort of deep concern for the planet (though it does make for good PR), nothing at all about actual humanitarian beliefs or honest emotion or spiritual reverence, and has absolutely everything to do with the corporation's rabid manifesto: cost-cutting and profit.
>
> The reason Scott promised that Wal-Mart will double the fuel efficiency of their huge truck fleet within a decade? Not to save the air, but to save $300 million in fuel costs per year. The reason they aim to increase store efficiency and reduce greenhouse gasses by 20% across all stores worldwide? To save money in heating and electrical bills, and also to help lessen the impact of global warming, which is indirectly causing more violent weather, which in turn endangers production and delivery and Wal-Mart's ability to, well, sell more crap. Ah, capitalism.[4]

In reviewing the leading business stories of the year 2006, columnist Joel Makower, a veteran commentator on green issues wrote:

> Two thousand six may be the year that green business crossed the line from a movement to a market. It was long in coming, of course, with several watershed moments…In 2006, GE initiatives to harness "green" as an engine for topline growth hit their stride… ahead of its plan to reach

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[1] Jeffrey Immelt and Jonathan Lash, Washington Post, May 21, 2005; Page A19.
[2] Marc Gunther, "The Green Machine," Fortune Magazine, July 27 2006 money.cnn.com/magazines/fortune/fortune_archive/2006/08/07/8382593/index.htm, 30 October 2006.
[3] Ibid.
[4] Mark Morford SF Gate, "Can You Still Hate Wal-Mart? It's a shockingly eco-friendly plan from the world's most toxic retailer. Did hell just freeze over?" SF Gate, May 24, 2006 www.sfgate.com/cgi-bin/article.cgi?file=/gate/archive/2006/05/24/notes052406.DTL, 30 October 2006.

$20 billion in annual sales of Ecomagination products by 2010.

Dupont launched its own initiative, committing to $6 billion in new revenue from "business offerings addressing safety, environment, energy, and climate challenges." Dow came on board with the aforementioned water initiative. Carpet maker Interface introduced a consulting service to help organizations as diverse as Sara Lee and NASA get their sustainability programs off the ground. Caterpillar launched an ambitious business unit to develop a remanufacturing industry in China. And a wide range of innovators developed new, clean technologies for everything from bottles to buildings to boats -- part of the year's overall boom in clean-tech activity….

Shareholders—specifically, large institutional investors like pension funds and university endowments -- are emerging as the real power brokers in the climate arena...

The leading investment firms are jumping in, too. Merrill Lynch, for one, issued a report profiling seven companies it believes are best positioned to capitalize on what it calls the "clean car revolution." Citigroup, JP Morgan Chase, and Morgan Stanley also published research reports analyzing the financial performance of the carbon markets, sometimes identifying who's naughty and nice -- that is, the leaders and laggards in their various sectors.[5]

The business community is actually often ahead of the government in being willing to take an aggressive stance on protecting the climate. For years, many American businesses succumbed to the concerted media campaign claiming that taking action against global warming will harm businesses and the economy.[6] Now, business leaders are recognizing that, in fact, quite the opposite is true: The conventional wisdom that businesses will oppose efforts to implement programs to protect the environment is increasingly antiquated thinking.

Many business leaders see a need to abate climate change for moral reasons. Lee Scott, CEO of Wal-Mart, stated in the pages of Fortune Magazine:

> There can't be anything good about putting all these chemicals in the air. There can't be anything good about the smog you see in cities. There can't be anything good about putting chemicals in these rivers in Third World countries so that somebody can buy an item for less money in a developed inherently wrong, whether country. Those things are just you are an environmentalist or not.[7]

There is an opportunity now to begin a new conversation between citizens, the companies that deliver the services we all desire, and the government we have empowered to set policy to achieve the sort of future we all desire.

No Regrets Strategy

Companies often start a program of GHG reductions because they realize that acting now is a "no regrets" strategy. If climate change turns out to be real, they will already be in a leadership position by dealing responsibly with it. Even if the scientists are wrong and there is no threat to the climate, these are actions that a well-managed business would want to take anyway, because doing so is profitable. Enormous opportunities exist to reduce costs by reducing the energy they use to run their operations. It just happens that this is exactly the same strategy they would employ to reduce their GHG emissions.

There is a very solid business case for such a position. Adopting an aggressive program of GHG reductions can be highly profitable for companies and

[5] Greenbiz.com, Joel Makower, Top Green Business Stories of 2006, January 3 2007, www.greenbiz.com/news/reviews_third.cfm?NewsID=34384.
[6] USA Today, "Group: ExxonMobil paid to mislead public," http://www.usatoday.com/money/industries/energy/2007-01-03-global-warming_x.htm, Updated 4 January 2007.
[7] Marc Gunther, "The Green Machine," Fortune Magazine, July 27 2006 money.cnn.com/magazines/fortune/fortune_archive/2006/08/07/8382593/index.htm, 30 October 2006.

cost-effective for non-profit (including government) organizations.[8] Reducing the amount of energy that a business uses reduces costs and directly enhances a company's bottom line. Failing to reduce energy use, and tolerating carbon emissions as part of "business as usual" is actually a high-risk strategy for a business or for a community.

Companies that reduce GHG emissions, especially in the context of a broader whole-system corporate sustainability strategy, will achieve multiple benefits for shareholders beyond reducing their contribution to global climate change. Governments that take a similar course will accrue similar benefits to their citizen stakeholders.[9]

These benefits include:

Enhanced financial performance from energy and materials cost savings in:

- **industrial processes;**
- **facilities design and management;**
- **fleet management;** and
- **government operations.**

Enhanced core business value:

- **sector performance leadership;**
- **greater access to capital;**
- **first mover advantage;**
- **improved corporate governance;**
- **the ability to drive innovation and retain competitive advantage;**
- **enhanced reputation and brand development;**
- **market share capture and product differentiation;**
- **ability to attract and retain the best talent;**
- **increased employee productivity and health;**
- **improved communication, creativity, and morale in the workplace;**
- **improved value chain management;** and
- **better stakeholder relations.**

Reduced Risk:

- **insurance access and cost containment;**
- **legal compliance;**
- **ability to manage exposure to increased carbon regulations;**
- **reduced shareholder activism; and**
- **reduced risks of exposure to higher carbon prices.**

Leading CEOs around the world know this. CEOs surveyed by the World Economic Forum in Davos in 2000, stated that for them, "The greatest challenge facing the world at the beginning of the 21st Century—and the issue where business could most effectively adopt a leadership role—is climate change."[10] The Climate Group website[11] lists case studies of companies and communities that are reducing their emissions and saving money.

Businesses Face Growing Pressure to Reduce Emissions

In November 2004, essentially all of the world's industrial nations ratified the Kyoto Protocol to reduce the emissions of GHG gasses (the U.S. and Australia are the only significant holdouts). The Protocol came into force February 16, 2005, launching a new "carbon-constrained" era for the 141 countries that ratified it.[12] Among its many provisions, the accord established regulations limiting the amount of carbon that nations can emit, and created a carbon market through which companies that reduce further than they are required can sell this extra reduction to companies unable to meet their targets.

European countries, as members of the Kyoto Protocol, are now bound by this mandatory trading regime. The European Commission plans to cut energy use 20% by 2020 and increase European use of renewable energy to 12% by 2012.

[8] Amory Lovins and L. Hunter Lovins, *Climate: Making Sense and Making Money*, Rocky Mountain Institute, 1997.
[9] For a detailed synthesis of this thesis refer to K. Hargroves, and M. Smith, *The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century*, Earthscan, (2005). Developed by The Natural Edge Project www.naturaledgeproject.net, 30 October 2006.
[10] Douglas G. Cogan, "Corporate Governance and Climate Change: Making the Connection", a CERES Sustainable Governance Project Report Prepared by the Investor Responsibility Research Center, June 2003.
[11] The Climate Group, www.theclimategroup.org/, 11 September 2006.
[12] As of February 2005, 141 countries have ratified the Kyoto Protocol. Seven including the United States, Australia and Indonesia signed it but have so far refused to ratify.

This should reduce Europe's emissions by a third. The program is projected to save 60 billion Euros, create millions of new jobs and increase European competitiveness. American businesses are at risk of losing ground to European competitors as they innovate to meet these goals.

For example, STMicroelectronics (ST), a Swiss-based, $8.7 billion, multi-national semiconductor company, set a goal of zero net GHG emissions by 2010 while increasing production 40-fold.[13] The main sources of ST's GHG emissions are 45% facility energy use, 35% industrial process (PFC[14] and SF6[15]) emissions and 15% more efficient transportation. Its strategy is to reduce on-site emissions by investing in co-generation (efficient combined heat and electricity production[16]) and fuel cells (efficient electricity production).

By 2010 co-generation sources should supply 55% of ST's electricity with another 15% coming from fuel switching to renewable energy sources. The rest of the reductions ST is seeking will be achieved through improved energy efficiency (hence reducing the need for energy supply) and various projects to sequester carbon.

ST's commitment has driven corporate innovation and improved profitability. During the 1990s, its energy efficiency projects averaged a two-year payback (a nearly 71% after-tax rate of return).[17]

Making and delivering on this promise has also driven ST's corporate innovation and increased its market share, taking the company from the number 12 micro-chip maker to the number six in 2004.[18] By the time ST meets its commitment, it predicts that it will have saved almost a billion dollars.

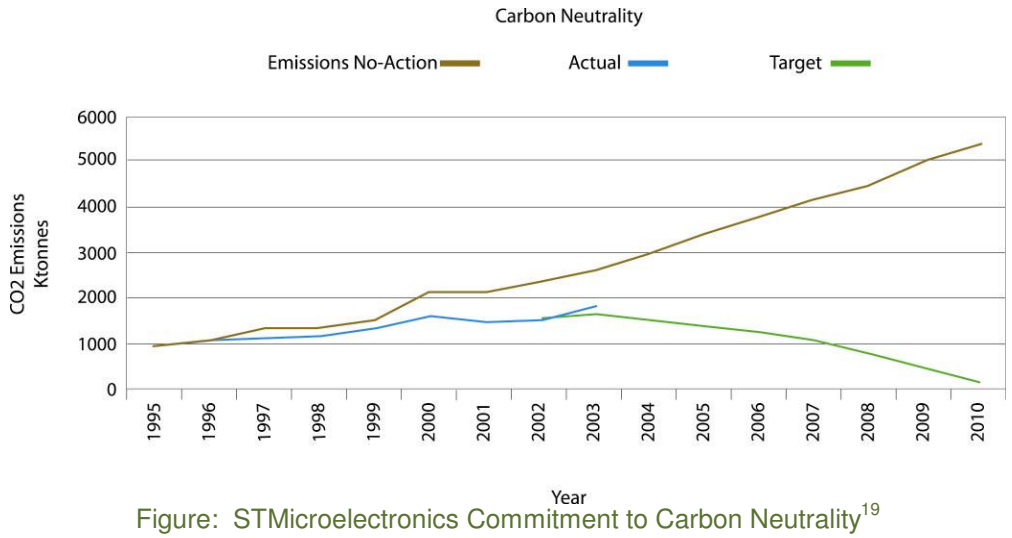

Figure: STMicroelectronics Commitment to Carbon Neutrality[19]

[13] STMicroelectronics (2003) Sustainable Development report, www.bl.uk/pdf/eis/stmicroelectronics2003is.pdf, 11 September 2006, 30 October 2006.
[14] PFC (perfluorocarbon) is a powerful greenhouse gas emitted during the production of aluminum; a fluorocarbon is a halocarbon in which some hydrogen atoms have been replaced by fluorine; used in refrigerators and aerosols.
[15] Sulfur Hexafluoride (SF6) is another potent greenhouse gas. It one of the most popular insulating gases.
[16] Conventional power stations that burn fossil fuels give off a lot of heat, wasting as much as 70% of the energy they consume.
[17] STMicroelectronics Environmental Report, 2001. It further reported that no energy efficiency project undertaken incurred more than a three year payback. The source of the correlation of years payback to real after-tax rate of return is Hawken, Lovins, and Lovins, Natural Capitalism, p.267.
[18] IC Insights, IC Insights Announces 1Q 05 Top Ten Semiconductor Supplier Ranking," from www.icinsights.com, 30 October 2006
[19] STMicroelectronics Sustainable Development Report 2003.

The Emerging Greenhouse Gas Marketplace

In January 2005, an independent commission of businesspeople, politicians and scientists[20] released a report to the G8 meeting, urging member countries to cut carbon emissions, double their research spending on green technology and work with India and China to build on the Kyoto Protocol's mechanisms for carbon-saving projects. The report recommended that the major countries agree to generate a quarter of their electricity from renewable sources by 2025 and to shift agricultural subsidies from food crops to biofuels.

The report recommended wider international use of emission trading schemes, which are already in use in the European Union, under which unused CO_2 quotas are sold.

The profit motive, stated the report, is expected to drive investment in new technology to cut emissions further.

The advent of the Chicago Climate Exchange (CCX) carbon trading mechanism provides companies and other organizations emitting GHGs both the opportunity to systematically reduce their emissions, sell greater reductions in emissions and participate in a proven risk-management system of futures contracts and financial derivatives.[21]

CCX is North America's only, and the world's first, GHG emission registry, reduction and trading system for all six GHGs of which CO_2 dominates. It recently announced a partnership to create the Canadian Climate Exchange, and is in negotiations with such countries as China and India. It also offers offset projects in the United States, Canada, Mexico and Brazil. It is a self-regulatory, rules-based exchange designed and governed by its members.

Members make a voluntary but legally binding commitment to reduce GHG emissions. By the end of Phase I (December, 2006) all members will have reduced direct emissions 4% below a baseline period of 1998-2001. Phase II, which extends the CCX reduction program through 2010, will require all new members to reduce GHG emissions 6% below baseline and extends current members commitment to an additional 2% reduction below baseline. In the first year, members of the exchange collectively reduced their carbon emissions by 9%, or 2% more than would have been required had the U.S. been a member of the Kyoto Protocol. Companies undertaking such programs are finding that it can save significant amounts of money. Opening with 16 members in December of 2004, CCX now has over 200 members (including such businesses as DuPont, and American Electric Power, IBM, Ford Motor Co. IBM, Motorola, Dow Corning, Waste Management and Baxter Health Care) representing over 8% of all direct U.S. GHG emissions. The State of New Mexico, cities such as Chicago and Boulder, universities such as Presidio School of Management, Tufts and University of Oklahoma, and a wide array of smaller businesses and non-profit groups are also members.[22]

CCX has proven that businesses can engage in reduction of emissions and remain profitable. But it is only the first of a growing number of efforts to create carbon markets in the United States. The seven Northeastern states have approved the Regional Greenhouse Gas Initiative, a mandatory regulatory scheme. Over 20 states have already either passed or proposed legislation on CO_2 emissions, or have developed carbon registries.

In August 2006, California became the first state in the nation to impose mandatory limits on GHG emissions, requiring a 25% cut in GHGs by 2020 that would affect companies from automakers to manufacturers. The state is the 12th largest carbon emitter in the world despite leading the nation in energy efficiency standards and its lead role in protecting its environment.[23]

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[20] "Global Warming Approaching Critical Point 'An Ecological Time-bomb is Ticking Away'," CNN Report, Monday, 24 January 2005.
[21] Chicago Climate Exchange, www.chicagoclimatex.com/, 11 September 2006.
[22] Natural Capitalism was one of the earliest members.
[23] San Francisco Chronicle "Landmark Deal on greenhouse gas emissions", 30 August, 2006, sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/08/30/MNGBMKS7733.DTL, 12 September 2006.

The California Chamber of Commerce opposed the bill, but such business groups as A New Voice for Business[24] supported the measure, stating that it would create jobs and help to launch a whole new industry in California. Many believe the legislation will be the turning point in the country's global warming policy.

There is now such a proliferation of inconsistent carbon reduction regimes that in April 2006, a group of major businesses called on Congress to pass national legislation capping carbon emissions to relieve them of having to navigate the competing schemes.

At the hearing before the Senate Energy and Natural Resources Committee leaders representing eight big energy companies, including GE, Shell and the two largest owners of utilities in the United States, Exelon and Duke Energy, spoke. Six of the eight said they would welcome or accept mandatory caps on their GHG emissions. Wal-Mart executives also spoke in favor of carbon caps. The companies stated that federal regulations would bring stability and sureness to the market. David Slump, the top marketing executive in GE's energy division, stated, "GE supports congressional action now." Two representatives from the energy sector, Southern Company and American Electric Power, called for a voluntary rather than mandatory program, but they acknowledged that regulations may be coming, and offered detailed advice on how they should be designed. [25]

At subsequent Senate hearings on global warming, Senator Bingaman asked representatives of CCX whether there were any reasons that the U.S. should not simply implement CCX as the basis for a regulated U.S. carbon market. Cities, counties and companies that join CCX might, thus, just be ahead of the regulatory game.

The Business Case for Not Waiting for Regulation

While it is highly likely that some form of national cap and trade system will emerge in the U.S. soon, companies should not wait until they are forced to limit their emissions. The early adopters gain substantial first mover advantages.

As energy prices have risen, many companies have chosen to go ahead and implement energy savings measures. Over a 12-year period in the 1980s, Dow's Louisiana plant was able to save enough energy implementing worker suggested savings measures to add $110 million each year to the bottom line. Each measure also reduced Dow's carbon footprint.[26]

In 2000, as part of re-branding itself as "Beyond Petroleum," British Petroleum (BP) announced a corporate commitment to reduce its emissions of GHGs. In 1997, in a speech at Stanford University, California, group chief executive Lord Browne stated, "BP accepted that the problem was potentially very serious and that precautionary action was justified." BP then announced a target for 2010: that GHG emissions from its own operations would be 10% lower than emissions in 1990. BP achieved that target at the end of 2001, nine years ahead of schedule, and gained around $750 million in net present value through increased operational efficiency, the application of technological innovation and improved energy management. While returns on traditional investments average 40-50%, investments in increasing energy efficiency often return 70% or more.[27] BP is now one of the world's largest solar companies and sees its 50-year future as one of transition away from fossil fuels to becoming an energy company.

Financial savings are not the only reason that companies engage in such behavior. Rodney Chase, a senior executive at BP, subsequently reflected that even if the program had cost BP money, it would have been worth doing because it made them the kind of company that the best talent wants to work for.[28] It is reducing costs, gaining market

[24] New Voice of Business, www.newvoiceofbusiness.org/, 12 September 2006.
[25] Conceding on Climate Change: For the first time, energy execs are requesting caps on carbon emissions. But will new regulations be too little, too late? By Amanda Griscom Little www.salon.com/opinion/feature/2006/04/10/muckraker/index_np.html, 12 September 2006.
[26] Hawken, Lovins, Lovins 1999, *Natural Capitalism*, Little Brown P. 245. *Natural Capitalism* and *Factor Four*, Lovins, Lovins von Weizsacker, 1997, Earth Scan, document hundreds of such savings opportunities.
[27] BP 2003 Sustainability Report.
[28] Personal communication with Hunter Lovins, 2002 Fortune Magazine Annual Meeting, Aspen, CO.

share and attracting and retaining the best talent.[29]

DuPont, an even earlier entrant into the field, committed itself to reducing its GHGs by 65% from 1990 to 2010. The company also set plans to raise revenues 6% per year from 2000-2010 with no increase in energy use; and by 2010, source 10% of its energy and 25% of its feed-stocks from renewable sources. The company announced these goals in the name of increasing "shareholder and societal value."

To date, DuPont has kept energy use the same and increased production by 30%. Globally, DuPont's emissions of GHGs are down 72%. Global energy use is 7% below 1990 levels, and the company is on track with its renewable energy targets. It estimates that this program has already saved the company $3 billion.[30] In one example, four engineers at DuPont recently figured out how to spend less than $100,000 to save nearly $7 million per year in energy costs.[31]

Under CEO Mike Eskew, United Parcel Service (UPS) has assembled one of the biggest alternative-fuel fleets, around 1,500 vehicles strong. In February 2006, UPS announced that it had placed an order for 50 new-generation hybrid-electric delivery trucks, which will reduce fuel consumption by 44,000 gallons over the course of a year.[32]

Many participants in the voluntary U.S. EPA performance-challenge programs (such as 33/50[33] and Green Lights[34]) reported that energy efficiency enabled them to capture multiple benefits. For example, Sony Electronics' U.S. and Mexican facilities voluntarily installed energy efficient lighting where it was cost-effective and did not interfere with the quality of light. By the end of 1994, the organization had upgraded approximately 6.1 million square feet of floor space with new lighting fixtures, reduced its operating expenses by more than $915,000 per year and lowered energy demand by almost 12 million kilowatt hours annually. In addition, these lighting changes indirectly prevented more than 7,300 tons of air pollution from being emitted by local utility companies.[35]

Sony found its participation in the EPA's Green Lights program often improved visual performance so significantly that it led to significant increases in labor productivity and reductions in error rates. The financial benefits from this far outweigh the value of the energy savings. For example, Boeing implemented a lighting system retrofit in its design and manufacturing areas. The program cut lighting energy costs by 90% with a less than 2-year payback, but because workers could see better they avoided rework—the error rate decreased 30%—which increased on-time delivery, and enhanced customer satisfaction.[36]

Lockheed commissioned a new headquarters building for its Sunnyvale facility. The architects successfully argued that the "literium" that provided day-lighting throughout the structure was not merely a worker amenity, but was essential to the performance of the building. They were right: the lighting system resulted in a 75% reduction in lighting energy usage. This contributed to enabling the building to use half the energy of a comparable standard building. The different design added $2 million to the cost of the building—the reason the "value engineers" sought to eliminate it from the design.

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[29] BP now states this on its website and in its advertisements.

[30] Marc Gunther, "The Green Machine," Fortune Magazine, July 27 2006 money.cnn.com/magazines/fortune/fortune_archive/2006/08/07/8382593/index.htm, 30 October 2006.

[31] DuPont reports: www1.dupont.com/NASApp/dupontglobal/corp/index.jsp?page=/social/SHE/usa/us3b.html, 12 September 2006.

[32] Marc Gunther, "The Green Machine," Fortune Magazine, July 27 2006 money.cnn.com/magazines/fortune/fortune_archive/2006/08/07/8382593/index.htm, 30 October 2006.

[33] Arora, S. and Cason, T., "An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program," Journal of Environmental Economics & Management, vol. 28, no 3, 1995, pp. 271–286. Also see Arora, S. and Cason, T., "Why do Firms Volunteer to Exceed Environmental Regulations? Understanding Participation in EPA's 33/50 Program," Land Economics, November 1996, pp 413–432.

[34] DeCanio, S, "The Efficiency Paradox: Bureaucratic and Organizational Barriers to Profitable Energy-Saving Investments," Energy Policy, vol. 26, no 5, 1998, pp. 441–454. Also see S. DeCanio and Watkins, W., "Investment in Energy Efficiency: Do the Characteristics of Firms Matter?" Review of Economics and Statistics, February 1998, pp. 95–107.

[35] Sony Electronics Inc. is not only committed to being the best at bringing advanced technology together with the needs of the end-user, it is also dedicated to protecting and improving the environment in all areas of the company's operations, news.sel.sony.com/en/corporate_information/environmental, 30 October 2006.

[36] Romm and Browning, *Greening the Building and the Bottom Line: Increasing Productivity Through Energy-Efficient Design*, 1994.

However, it is saving Lockheed $500,000+ per year worth of energy, or a four-year payback. The greatest benefit to Lockheed was the effect on their human capital: because workers enjoyed the space, absenteeism dropped by 15% and productivity increased 15%. The gains from this won Lockheed a very competitive contract, the profits from which paid-off the entire costs of the building.[37]

It appears that people simply perform better in well-designed spaces. A study by Pacific Gas and Electric Company (PG&E) showed that in good "green" buildings, day-lighting can enable students to achieve 20 to 26% higher test scores, and retail stores to have up to 40% higher sales than conventional stores.[38]

In 1987, the former NMB Bank in The Netherlands completed a new 538,000 square foot headquarters. The bank's management, desiring to improve the somewhat stodgy image of the company, commissioned the creation of a "green headquarters." The building uses 10% of the energy of a similar building constructed at the same time (90% savings). The annual energy savings of $2.9 million required only $700,000 additional building cost—a three-month payback on energy costs alone. Employees reported being more comfortable and absenteeism declined 15%, dramatically increasing project return on investment. The new headquarters achieved its goal: it dramatically improved the image of the bank—which became the second largest bank in the Netherlands. The bank renamed itself ING and subsequently bought Bearings.[39]

The Impact on Small Businesses

Community programs to reduce energy use are particularly good for small businesses. Back in the 1970s when energy prices were rising, communities began implementing programs to reduce their use of energy. The results were extraordinary, and can be replicated today.

In 1974, the Osage Municipal Utility was faced with the need to build a new power plant to meet growing demand. Its general manager, Wes Birdsall, realized that if he built the plant, it would increase everyone's rates. Instead, he stepped across the meter to his customers' side and helped them use less of his product: electricity. Why on earth would a businessman ever do that?

Birdsall realized that what his customers wanted was not raw kilowatt-hours, but the energy "services" of comfort in their homes: shaft-power in factories, illumination, cold beer and the other services that energy delivers. People buy energy, but what they really want is the service. If they can get the same or improved service more cheaply using energy more efficiently or from a different source, they will jump at it. Birdsall realized that if he raised his prices, not only would he be doing his customers a disservice, but that they might turn to other options. By meeting their desires for energy services at lower cost, he retained them as customers, and began one of the most remarkable economic development stories in rural America.

Birdsall's program was able to save over a million dollars a year in this town of 3,800 people and generate over 100 new jobs. A report on the program found that, "Industries are expanding and choosing to remain in Osage because they can make money through employees who are highly productive and through utility rates that are considerably lower than neighboring cities."[40] Birdsall was able to reduce electric bills to half that of the state average and unemployment to half that of the national average, because with the lower rates new factories came to town. He held electric growth level until 1984. The program was profiled in the *Wall Street Journal*, and was copied by other utilities.

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[37] Ibid.
[38] Heschong Mahone Group, www.h-m-g.com/projects/daylighting/projects-PIER.htm, 8 September 2006 .
[39] Hawken, Lovins and Lovins, *Natural Capitalism* p 52. Also see Rocky Mountain Institute, www.rmi.org/sitepages/pid208.php, 30 October 2006.
[40] Health and Energy Company, a Nebraska energy testing company, healthandenergy.com/osage_energy_efficiency.htm, 12 September 2006.

According to a USDA study of Osage, "The local business people calculated that every $1 spent on ordinary consumer goods in local stores generated $1.90 of economic activity in the town's economy. By comparison, petroleum products generated a multiplier of $1.51; utility services, $1.66; and energy efficiency, $2.23. Moreover, the town was able to attract desirable industries because of the reduced energy operating costs resulting from efficiency measures put in place. Energy efficiency has a long and successful track record in Osage as a key economic development strategy."[41]

Thirty years later, a June 2006 article in Business Week pointed out that small businesses, the economic engine of growth, will be especially hard hit by climate change, and can disproportionately benefit from programs to reduce their emissions, stating:

> It's increasingly likely that a mandatory program to reduce greenhouse gas emissions will come to pass. This prospect of further government regulation is one reason small business owners should pay attention. But it's not the only one. Small firms could well be among the hardest hit victims of climate change.
>
> Extreme weather events, for example, can wipe out an entire region's small businesses in one fell swoop. And they can't readily bounce back from disruptions caused by natural disasters. Look at the impact of Hurricane Katrina on small businesses in the Gulf Coast region, where they constituted the backbone of the economy….
>
> There's been virtually no research on what global warming means for small business, even though 23 million U.S. small businesses constitute one-half of the economy.
>
> There is some good news for small businesses, however. To start with, 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.
>
> What's more, devising technological fixes to curb GHG emissions must rely on the capacity of small business innovators and entrepreneurs to produce "clean-tech" breakthroughs in photovoltaics, distributed energy, fiber-optic sensors, and the like.
>
> Finally, every single small business in the nation can profit by making its own workplace more energy-efficient. According to the EPA's Energy Star Small Business program, small firms can save (at least) 20% to 30% on their energy bills through off-the-shelf cost-effective efficiency upgrades. The job consists largely of installing the same few simple devices—programmable thermostats, for example—over and over again in millions of small business workplaces.[42]

Small office buildings can achieve similar savings. A project to remodel a 2,800 square foot law office in Louisiana improved employee productivity with energy systems that saved over $6,000 while eliminating 50 tons of CO_2 emissions per year.[43]

Combining Energy Efficiency and Renewables

In 1989, the municipal utility in Sacramento, California shut down its 1,000-megawatt nuclear plant. Rather than invest in any conventional centralized fossil fuel plant, the utility met its citizens' needs through energy efficiency and such renewable supply technologies as wind, solar, biofuels and distributed technologies like co-generation, fuel cells, etc. In 2000, an econometric study showed that the program has increased the regional economic health by over $180 million, compared to just

[41] "The Jobs Connection: Energy Use and Local Economic Development," Tomorrow's Energy Today, US Department of Energy, 1994.
[42] Byron Kennard, "Global Warming on Main Street," Business Week, 27 June 2006.
[43] Case study from greenerbuildings.com: www.greenerbuildings.com/case_studies_detail.cfm?LinkAdvID=38528. 12 September 2006.

running the existing nuclear plant. The utility was able to hold rate levels for a decade, retaining 2,000 jobs in factories that would have been lost under the 80% increase in rates that just operating the power plant would have caused. The program generated 880 new jobs, and enabled the utility to pay off all of its debt.

Toyota's Torrance, California office complex, completed in 2003, combines energy-efficiency strategies such as roof color, photovoltaic solar electricity and "little things," including an advanced building automation system, a utilities metering system, natural-gas-fired absorption chillers for the HVAC system, an Energy Star cool roof system and thermally insulated, double-paned glazing. The 600,000+ square foot campus exceeds California's stringent energy efficiency requirements by 24% at no additional cost than a conventional office building.[44]

A recent article by utility regulator S. David Freeman, once Chair of the Tennessee Valley Authority, and Jim Harding of the Washington State Energy Office announced that a company called Nanosolar is building a $100 million manufacturing facility in California to produce solar cells very cheaply. The resulting solar panels would bring the cost of power to below what is now available in a large part of the world. Backed by a powerful team of private investors, including Google's two founders and the insurance giant Swiss Re, Nanosolar announced plans to produce 215 megawatts of solar energy next year, and soon thereafter capable of producing 430 megawatts of cells annually.

What makes this particular news stand out? Cost, scale and financial strength. The cost of the facility is about one-tenth that of recently completed silicon cell facilities.

Second, Nanosolar is scaling up rapidly from pilot production to 430 megawatts, using a technology it equates to printing newspapers. That implies both technical success and development of a highly automated production process that captures important economies of scale. No one builds that sort of industrial production facility in the Bay Area—with expensive labor, real estate and electricity costs—without confidence.

Thin solar films can be used in building materials, including roofing materials and glass, and built into mortgages, reducing their cost even further. Inexpensive solar electric cells are, fundamentally, a "disruptive technology," even in Seattle, with below-average electric rates and many cloudy days. Much like cellular phones have changed the way people communicate, cheap solar cells change the way we produce and distribute electric energy. The race is on. The announcements are good news for consumers worried about high energy prices and dependence on the Middle East, utility executives worried about the long-term viability of their next investment in central station power plants, transmission, or distribution, and for all of us who worry about climate change. It is also good news for the developing world, where electricity generally is more expensive, mostly because electrification requires long-distance transmission and serves small or irregular loads. Inexpensive solar cells are an ideal solution–by far the least expense way to bring electric power to areas not now served by an electric grid, safer from terrorists and saboteurs, and able to be put "on-line" years ahead of traditional central generation plans and their elaborate transmission and distribution systems.

Meanwhile, the prospect of this technology creates a conundrum for the electric utility industry and Wall Street. Can—or should—any utility, or investor, count on the long-term viability of a coal, nuclear or gas investment? The answer is no. In about a year, we'll see how well those technologies work. The question is whether federal energy policy can change fast enough to join

[44] Larry Flynn, "Driven to be Green," Building Design and Construction Magazine, 1 November 2003, www.bdcnetwork.com/article/CA335621.html?text=driven+to+be+green, 30 October 2006.

what appears to be a revolution.[45]

Renewable options are not only the best choice for developing countries; they are now the fastest growing form of energy supply around the world, and in many cases are cheaper than conventional supply. Solar thermal is outpacing all conventional energy supply technology around the world. Modern wind machines come second, delivering almost 8,000 megawatts of new capacity a year, or more than nuclear power did at the peak of its popularity. The next fastest growing energy supply technology is solar electric, even at current prices.[46]

Renewables can also be cheaper than any conventional supply. Energy from wind turbines in good sites now costs 3¢ per kilowatt-hour (kWh).[47] And once the turbine is constructed, the fuel is free forever more. Just running an existing coal plant costs 5¢ to 6¢ per kWh. Solar electric is more expensive, although about a dozen companies are competing to deliver amorphous thin-film solar at 3¢ per kWh. Such renewable technologies lend themselves to construction and delivery by small to medium sized enterprises - the backbone of most economies around the world.

The Governor of Pennsylvania recently announced the opening of a factory to make wind machines. Creating 1,000 new jobs over the next five years, it is the biggest economic development measure for Johnstown, PA, in recent memory. The city of Chicago underwrote Spire solar to enable the company to open a manufacturing plant in Chicago. The city wanted the jobs and to be able to install solar on municipal buildings. California has announced that it will spend over $8 million installing solar in 2006, and create a $1.5 billion investment fund to help environmentally responsible companies that are developing cutting-edge clean energy technologies.

A 2006 study by University of California professors recently found that investments in renewable energy create ten times as many jobs as investments in fossil supply.[48]

Ability to Capture Opportunities

Business success in a time of technological transformation demands innovation. Since the Industrial Revolution, there have been at least six waves of innovation, which shifted the technologies that underpinned economic prosperity. In the late 1700s textiles, iron mongering, water-power and mechanization enabled modern commerce to develop.

The second wave saw the introduction of steam power, trains and steel. In the 1900s, electricity, chemicals and cars began to dominate. By the middle of the century it was petrochemicals, and the space race, along with electronics. The most recent wave of innovation has been the introduction of computers, also known as the digital or information age. As the industrial revolution plays out and economies move beyond iPods, older industries will suffer dislocations, unless they join the increasing number of companies implementing the array of sustainable technologies that will make up the next wave of innovation.

[45] Dave Freeman and Jim Harding, "Solar Cells Change Electricity Distribution," The Seattle Post Intelligencer, Thursday 10 August 2006 seattlepi.nwsource.com/opinion/280625_solarcell10.html, 30 October 2006.
[46] Solar photovoltaic prices are falling rapidly. A company in California is introducing a new production process that will reduce prices to 3¢/kWh within four years. Wind in good cites now costs 3¢/kWh, and in conventional sites. National Renewable Energy Laboratory. Wind Energy Myths Fact Sheet: www.nrel.gov/docs/fy05osti/37657.pdf#search=%22wind%203%C2%A2%2FkWh%22, 10 June 2005.
[47] Lovins, A., Datta, K., Feiler, T., Rábago, K., Swisher, J., Lehmann, A. and Wicker, K. (2002) *Small Is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size*, available from Natural Capitalism Solutions: www.natcapsolutions.org, 30 October 2006.
[48] Robert Sanders, "Investment in renewable energy better for jobs as well as environment," www.berkeley.edu/news/media/releases/2004/04/13_kamm.shtml, 13 April 2004.

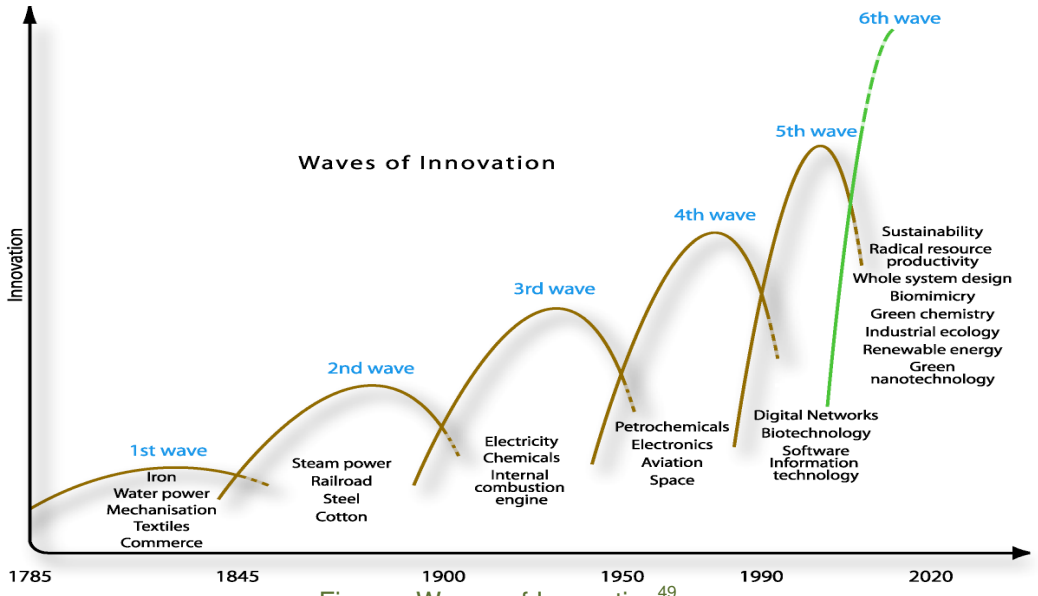

Figure: Waves of Innovation[49]

Aidan Murphy, vice president at Shell International, stated in 2000:

> The Kyoto treaty has prompted us to shift some of its [Shell's] focus away from petroleum toward alternative fuel sources. While the move has helped the company make early strides toward its goal of surpassing treaty requirements and reducing emissions to 10% less than 1990 levels, *Shell is being driven largely by the lure of future profits*… We are now involved in major energy projects involving wind and biomass, but I can assure you this has nothing to do with altruism… *We see this as a whole new field* in which to develop a thriving business for many years to come. Capital is not the problem, it's the lack of ideas and imagination.[50]

Sweden has set a national goal of an oil-free economy by 2020 without building any new nuclear plants. A report in the BBC stated, "The country aims to replace all fossil fuels with renewables before climate change damages economies and growing oil scarcity leads to price rises." The program is driven in part by worry on the part of The Royal Swedish Academy of Sciences that oil supplies are peaking, and that high oil prices could cause global economic recession. In 2003, 26% of all energy consumed came from renewables.[51]

To drive such innovation, Sweden, along with Germany and other European nations are experimenting with what is called "Tax Shifting." This would increase the taxes on resource use, while lowering employment taxes and other disincentives to use more people. Lester Brown recently reported that,

> A four-year plan adopted in Germany in 1999 systematically shifted taxes from labor to energy. By 2001, this plan had lowered fuel use by 5%. It had also accelerated growth in the renewable energy sector, creating some 45,400 jobs by 2003 in the wind industry alone, a number that is projected to rise to 103,000 by 2010.

Both Japan and China are now considering implementing such tax shifts.[52]

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[49] The Natural Edge Project, Australia, www.naturaledgeproject.net/, 30 October 2006.
[50] W. Drozdiak, "Big Corporations Alter View of Global Warming," Washington Post Service, Friday, 24 November 2000.
[51] BBC, Wednesday, 8 February 2006, 17:14 GMT news.bbc.co.uk/1/hi/sci/tech/4694152.stm, 30 October 2006.
[52] Lester Brown, "It's Income Tax Time for Americans, and It's Time For the Entire World to Lower Income Taxes and Raise Environmental Taxes," www.earthpolicy.org/Books/Seg/PB2ch12_ss2.htm, 30 October 2006.

Recently, 2,500 economists, including eight Nobel Prize laureates in economics, endorsed the concept of tax shifts. Harvard economics professor N. Gregory Mankiw wrote in Fortune:

> Cutting income taxes while increasing gasoline taxes would lead to more rapid economic growth, less traffic congestion, safer roads and reduced risk of global warming—all without jeopardizing long-term fiscal solvency. This may be the closest thing to a free lunch that economics has to offer.[53]

Without such a shift in policies, jobless growth for major corporations worldwide is likely to remain not a forecast, but an established trend. The world's 500 largest corporations have managed to increase their production and sales by 700% over the past 20 years, while at the same time *reducing* their total workforce. The outsourcing of industrial jobs to China and service jobs to India has accelerated the impact of this process.[54]

At the same time however, good people are increasingly critical for the functioning of any business that seeks to compete in the Knowledge Economy. Tom Peters, one of the world's leading business authors, states:

> We are in the midst of redefining our basic ideas about what enterprise and organization and even being human are–about how value is created and how careers are pursued.
>
> Welcome to a world where "value" (damn near all value!) is based on intangibles—not lumpy objects, but weightless figments of the Economic Imagination. We have entered an Age of Talent. People (their creativity, their intellectual capital, their entrepreneurial drive) is all there is. Enterprises that master the market for talent will do better than ever. But to attract and retain the Awesome Talent, an organization must offer up an Awesome Place to Work.[55]

As stated above, this is driving such companies as BP to make public commitments to cut their emissions as a strategy for attracting and retaining the best talent.

Richard Florida, in his book, *The Rise of the Creative Class*,[56] points out that the cutting-edge businesses follow the knowledge workers, establishing corporate operations where they can access this new class of talent. He notes that regions that wish to be economically successful will do what it takes to attract the knowledge workers, which includes preserving the environment and establishing the sort of innovative cultural atmosphere that such people treasure.

Cities and Companies—The New Leaders

The failure by the American federal government to take action on global warming has created a leadership vacuum that is rapidly being filled by cities, states and businesses.
In the U.S., over 355 cities have formally committed to take following three actions:

1. Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
2. Urge their state governments, and the federal government to enact policies and programs to meet or beat the GHG emission reduction target suggested for the United States in the Kyoto Protocol—7% reduction from 1990 levels by 2012; and
3. Urge the U.S. Congress to pass the bipartisan GHG reduction legislation, which would establish a national emission trading system[57]

[53] Ibid.
[54] William Greider: One World: Ready or Not (New York: Simon and Schuster, 1997; juxtaposition quoted in Success Digest March 1997).
[55] Tom Peters, Re-image, www.tompeters.com/reimagine/toc.php, 12 September 2006.
[56] Richard Florida, *Rise of the Creative Class*, Basic Books, 2002, www.creativeclass.org/press.htm, 12 September 2006.
[57] U.S. Mayors Climate Protection Agreement website, www.ci.seattle.wa.us/mayor/climate/default.htm#what, 11 January 2007.

The International Council for Local Environmental Initiatives' (ICLEI) "Cities for Climate Protection Program"[58] offers a coherent program a community can follow to implement a global warming mitigation program. This manual is offered as part of that program.

Tax Savings

These cities now understand a simple but important formula: climate protection saves tax dollars. In fact, climate protection can protect a city and its taxpayers from one of the most volatile demands that municipal budgets are likely to face in the years ahead: fossil energy prices.

In longhand, the formula goes like this: Global warming is slowed by reducing GHG emissions. GHG emissions are cut by reducing the consumption of fossil fuels. Fossil fuel use is cut by employing energy efficiency measures. Energy efficiency measures lead to lower energy bills. Lower energy bills mean lower operating costs. Lower costs for city operations save citizens tax dollars. So, taking action to slow global warming is one way to reduce tax expenditures. The savings can be used to cut taxes, to slow their growth, to improve critical city services that have been under-funded in the past, or to invest in more energy efficiency improvements (see box).

Tax Savings

CASE STUDY: States of Michigan and Oregon

In Ann Arbor, Michigan, a Municipal Energy Fund was established in 1998 to be a self-sustaining source of funds for investment in energy-efficient retrofits at city facilities, so the city would be able to continually reduce its operating costs over time. The city operates 60 facilities and spends $4.5 million per year on energy (out of an annual budget of $288 million in 2005). The Fund is administered by the city's Energy Office under the supervision of a three-person board, which must approve all projects. The Fund has invested in street light improvements, parking garage lighting, a boiler, two electric vehicles and photovoltaic cells. By providing the difficult up-front costs and then capturing 80% of the resulting savings, the Fund motivates facility managers to undertake energy efficient projects, and became self-sustaining in 3-5 years requiring no additional annual appropriations.

To launch its energy efficiency program, in late 1990s, Portland, Oregon created a "One Percent for Energy" program. It assessed eight municipal bureaus 1% of their energy bill to raise $70,000 a year for efficiency improvements without requiring direct support from the city's general fund. In return, contributing bureaus were given technical assistance to help them save money through energy efficiency improvements. The 1% is based on previous years energy bills including transportation, fuels, electricity, etc with a max of $15,000 per bureau. To date, the program successfully brings in approximately $70,000 each year.

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[58] ICLEI, www.iclei.org/index.php?id=1118, 11 September 2006.

Energy costs—and potential savings—are likely to increase in the future. Many experts predict that the volatility in fossil energy supplies and prices will continue. Most scientists now agree natural gas and oil are finite resources and that world oil production is expected to peak in the next couple of decades. China, India and other rapidly developing countries are competing with the U.S. for the same supplies, pushing up prices. Severe storms like Hurricane Katrina, which experts predict will become more common with global warming, can cause petroleum supply disruptions. Conflicts in, or political disputes with, oil-producing countries also will cause disruptions to oil and gas supplies. Even coal, which the U.S. currently mines in abundance, may prove to be a more expensive way to produce electricity in the future, as the industry invests in new processing technologies and sequestration measures to reduce carbon emissions.

During the winter of 2005-2006, the Massachusetts Municipal Association asked city managers around the state whether they expected increased energy costs. Sixty-five percent said they believed that energy costs would increase by more than 10% in the coming year—and one in four expected costs to increase by more than 25%.

Coast-to-Coast Pioneers

In 1991, well before global warming because a prominent issue for the public, Portland launched a "City Energy Challenge" to cut the annual energy bill of city buildings by 10% over 5 years. Over the last 15 years, the city saved $15 million and generated an additional $1.2 million in incentive payments from state government and utilities.

In addition, the city negotiated a purchase of wind energy from Portland General Electric, further reducing its demand for coal-fired electricity, preventing 4,500 metric tons of CO_2 emissions over five years, and deriving part of the city's energy from a resource that is immune from volatile price spikes because wind is a "free" fuel.

The city of New Haven, Connecticut, another leader in picking the low-hanging fruit of energy efficiency, created an energy conservation program in 1994 and estimates it has saved $24.7 million since then by doing simple measures.

Local schools provide a dramatic example of the savings waiting to be captured by public institutions. Schools in the U.S. reportedly spend more than $6 billion each year on energy, more than they spend on computers and books combined. In the typical school, about a third of that energy is wasted. Cost effective energy efficiency measures could easily save 25 to 30% of school energy bills, enough to hire 30,000 new teachers[59] while reducing the schools' contributions to global warming. Yet, some of the most obvious ways to save energy remain undone. An example: In the fall of 2005, two energy consultants in New Haven, CT, found a way to save the local school district $1.1 million in one year—by the elementary act of turning down thermostats when school buildings were not in use.[60]

These stories—and similar examples in cities across the U.S.—illustrate the multiple benefits of a municipal climate protection program. In this time of global warming and energy volatility, energy efficiency, renewable energy technologies and climate protection are three pillars of sound fiscal stewardship.

By investing in energy efficiency and renewable energy systems, local communities are also preparing themselves for the possibility of heightened regulations regarding GHGs coming in the future. Cities and companies that adopt the Kyoto Protocol agreements, and reduce GHG emissions below 1990 levels, will be able to sell their emission credits in any one of several carbon emission exchanges and stand a better chance of avoiding down-graded bond or stock ratings.

[59] "Reducing Greenhouse Gas Emissions: Municipal Solutions – Fact Sheet #5", Waquoit Bay National Estuarine Research Reserve, August 2002.
[60] Rebuild America, rebuild.gov, 30 October 2006.

Coast to Coast Pioneer

CASE STUDY: U.S. Army

Energy efficiency and renewable energy are of particular interest to the U.S. military. It has not been lost on those tasked with the security of the country that wasted energy, and dependence of foreign sources compromises their mission. A growing number of bases and commanders are implementing programs to reduce waste and secure greater energy supplies from local sources.

At Fort Detrick, Maryland, an energy performance contract will save 33,000 tons of CO_2 and $2.9 million annually.[61] Fort Carson's goal is 100% renewable energy by 2027; it is a 25 year plan initiated in 2002. Fort Carson also has interim goals to achieve 40% of electricity and 10% of facility heat from renewable sources by 2013.[62]

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The bottom line is simple: Protecting the climate is good fiscal stewardship. Global warming is an issue with many dimensions. For many people, the most important issue is the pocketbook—and the pocketbook is a strong argument for municipal climate action, sooner rather than later.

Business Risks of Failing To Address Climate Change

In a world that overwhelmingly recognizes climate change as a serious threat, businesses within a community that ignore it are increasingly seen as irresponsible. Conversely, an aggressive business posture to reduce GHG emissions is becoming a proxy for competent corporate governance. A 2003 Columbia Journal of Environmental Law article demonstrated the legal feasibilityof lawsuits holding companies accountable Though the effects of such litigation on companies' market value and shareowner value remains to be seen, the first such suits have already been filed.[63]

Legal Risks

In the U.S., the Sarbanes-Oxley Act[64] makes it a criminal offense for the Board of Directors of a company to fail to disclose to shareholders information that might materially affect the value of the stock. This includes environmental liabilities (including GHG emissions) that could alter a reasonable investor's view of the organization. In France, The Netherlands, Germany[65] and Norway, companies are already legally required to publicly report their GHG emissions.

A group of 143 institutional investors writes annually to the Financial Times 500, the largest quoted companies in the world by market capitalization, asking for disclosure of investment-relevant information concerning

[61] U.S. Department of Energy, www.eere.energy.gov/news/archive.cfm/pubDate=%7Bd%20'2002-10-30'%7D, 12 September 2006.
[62] Fort Carson Sustainability Program and SEMS, sems.carson.army.mil, 12 September 2006.
[63] Friends of the Earth, in conjunction with Greenpeace and several western cities, filed one of the first climate change lawsuits in 2004. The suit charges two U.S. government agencies with failing to comply with National Environmental Policy Act (NEPA) requirements to assess the environmental impact of projects they financed over the past decade. The states of Connecticut, Massachusetts and Maine have also filed a climate change lawsuit against another U.S. government bureau, the Environmental Protection Agency, for failing to regulate carbon dioxide emissions under the Clean Air Act.
[64] Francis X. Lyons, a former US EPA regional administrator now with Gardner, Carton & Douglas LLP, "Sarbanes-Oxley and the Changing Face of Environmental Liability Disclosure Obligations," Trends, Volume 35 No. 2, Nov/Dec 2003. Available from. www.gcd.com/db30/cgi-bin/pubs/Sarbanes2.pdf, 12 September 2006.
[65] In Germany, only "heavy" industry is currently required to report greenhouse gas emissions.

their GHG emissions.[66] Initially, perhaps 10% of the recipients bothered to answer the survey. In 2005, 60% answered. Companies like Ford Motor Company produced a major report detailing its emissions. Why the change? Passage that year of Sarbanes Oxley clearly played a role. Perhaps more significantly, the Carbon Disclosure Project represents institutional investors with assets of over $31.5 trillion. Increasingly, companies that wish to limit their risk exposure, obtain insurance or get financing are implementing programs to reduce their emissions of GHGs. for climate change.

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.[67]

The banking industry is also reducing its greenhouse footprint. In 2006, HSBC won the Financial Times' First Sustainable Banking Awards for being the first bank to become carbon neutral. It has purchased renewable energy for itself, and provided financing for renewable energy companies.[68]

Wall Street's most prestigious investment bank, Goldman Sachs, is putting $1 billion into clean-energy investments. It has also pledged to purchase more products locally.[69]

In March 2006, the business and investment network CERES released a report showing that many major American companies were more potentially liable for lawsuits and other risks than their European counterparts because of their emissions of climate changing gasses. The New York Times stated,

> Dozens of U.S. businesses in various climate-vulnerable sectors ... are still largely dismissing the issue or failing to articulate clear strategies to meet the challenge. Companies that disclose the amount of emissions of heat-trapping gases they produce and take steps to limit them cut their risks, including potential lawsuits from investors.[70]

Risk of Shareholder Resolutions

A growing number of investors are concerned about climate change. The number of investors participating in the Investor Network on Climate Risk (INCR, the leading group on sustainable investing) has quadrupled in the past three years, and the collective assets of INCR members increased from $600 billion to $2.7 trillion (an increase of 450%).[71] While cities are not directly involved, it is important to understand the trends occurring in the financial sector.

Large institutional investors are leading the way. Institutional investors have reason to be concerned about the impact of climate risk on their portfolios, and have been successful in urging companies to increase disclosure of climate risk by engaging the companies with an enduring shareholder campaign. Despite these successes, some investors are still frustrated with the Securities and Exchange Commission, which has done little to mandate disclosure of climate risk, and with many companies that have not yet taken proactive steps to address climate risk.

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[66] "Big Investors Demand Disclosure on Corporate Climate Practices," from GreenBiz.com, at website: www.greenbiz.com/news/news_third.cfm?NewsID=27640, 1 August 2006.
Joel Makower, Top Green Business Stories of 2006, www.greenbiz.com/news/reviews_third.cfm?NewsID=34384, 3 January 2007.

[67] "Market Consultation to the FTSE4 Good Climate Change Criteria", 2006 www.ftse.com/Indices/FTSE4Good_Index_Series/Downloads/FTSE4Good_Climate_Change_Consultation_Aug_06.pdf, 12 September 2006.

[68] Financial Times, 13 June 2006, Sustainable Bank of the Year, . news.ft.com/cms/s/c1f6fade-fafa-11da-b4d0-0000779e2340.html, 12 September 2006.

[69] Marc Gunther, "The Green Machine," Fortune Magazine, 27 July 2006 money.cnn.com/magazines/fortune/fortune_archive/2006/08/07/8382593/index.htm, 12 September 2006.

[70] Planet Ark, U.S. Oil Majors Seen Lagging in CO2 Risk Management www.planetark.com/dailynewsstory.cfm/newsid/35747/story.htm, 22 March 2006.

[71] Investor Network on Climate Risk, website: www.incr.com/, 31 July 2006.

A group of 28 leading institutional investors from the U.S. and Europe, who manage over $3 trillion in assets, announced a ten-point action plan which calls on investors, leading financial institutions, businesses, and government to address climate risk and seize investment opportunities.[72] The plan represents the first time that American and European investors have cooperated on a comprehensive climate risk initiative.

The 2005 action plan calls on U.S. companies, Wall Street firms and the Securities and Exchange Commission to intensify efforts to provide investors with comprehensive analysis and disclosure about the financial risks presented by climate change. The group also pledged to invest $1 billion in prudent business opportunities emerging from the drive to reduce GHG emissions.

Climate change will have an impact on the value of investments, and could cost U.S. public companies billions of dollars, ranging from unexpected drops in earnings due to fines and clean-up costs (following the violation of environmental laws), increased operating costs (following changes in environmental regulations), and greater than expected management costs due to understated or undisclosed liabilities.

Investors are starting to evaluate corporations on the basis of their preparedness for associated risks and opportunities. Indeed, some investors believe that companies that can't adapt to a carbon-constrained world will be forced to compete with forward-thinking competitors ready to leverage new business models and capitalize on emerging markets in renewable energy and clean technologies.

Despite the likely threat of global warming, the largest CO_2 polluters in the U.S. are failing to address the related financial risks. A recently released study by the nonprofit Investor Responsibility Research Center (IRRC) finds that while foreign rivals struggle to meet European Union CO_2 emission reduction targets, American companies such as ChevronTexaco, ExxonMobil, General Electric and Xcel Energy continue to ignore the threat of global warming.[73]

While it is not a current threat, cities may find their own bond ratings down-graded if they fail to take steps to prepare their own buildings and the homes and buildings of their residents and businesses to meet the climate challenge.

Other investors are using the power of shareholder resolutions, which mandate yes or no votes on specific practices at corporate annual meetings to affect company policies on climate change. According to the nonprofit Investor Network on Climate Risk, 28 shareholder resolutions calling for companies to either quantify and reduce GHG emissions or disclose corporate responses to climate change risks and opportunities were filed at 22 companies in 2004.[74] While the majority of such resolutions fail, the pressure often makes an impact, sending executives scurrying to make changes in anticipation of growing investor concern.

Companies which received resolutions included Allergan, Anadarko Petroleum, Analog Devices, Apache, Avery Dennison, Centex, Chevron, Corning, Dominion Resources, Dow Chemical, ExxonMobil, FirstEnergy, Ford Motor Company, General Motors, Health Care Property, JPMorgan Chase, Lennar, Liberty Property Trust, Newell Rubbermaid, Progress Energy, Ryland Group, Simon Property Group, Tesoro, Unocal, Vintage Petroleum, Wachovia, Wells Fargo and XTO Energy.[75]

In July 2004, eight state attorney generals and New York City led the first-ever climate change lawsuit against five of the nation's largest electric power generating companies to require them to reduce their CO_2 emissions.

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[72] Institutional Investor Summit on Climate Risk (2005), Summary, By Investor Network on Climate Risk, website: www.incr.com/index.php?page=19, 31 July 2006.

[73] A comprehensive discussion about corporate responsibility and shareholder resolutions is "Corporate Governance and Climate Change: Making the Connection," by Douglas Cogan for the Investor Responsibility Research Center, 2003, at website: www.irrc.com/company/CERES.Corp.Gov.Report.pdf, 30 October 2006.

[74] For a comprehensive list of climate-related shareholder resolutions, please see website hosted by the Investor Network on Climate Risk, at www.incr.com/index.php?page=ia&nid=186, 30 October 2006.

[75] Ibid.

In 2005, investor intervention and persuasion contributed to the decisions by several large companies (Anadarko Petroleum, Apache, Chevron, Cinergy, DTE Energy, Duke, First Energy, Ford Motor, GE, JPMorgan Chase and Progress Energy) to make new commitments such as supporting mandatory limits on GHGs, voluntarily reducing their emissions, or disclosing climate risk information to investors.[76]

The United Nations Environmental Programme (UNEP), working with the organization Ceres, announced a new Climate Risk Disclosure Initiative to create a global standard for climate risk disclosure.[77] The UNEP is developing Principles for Responsible Investment to align the long-term goals of sustainable development with the obligations of institutional investors. Ceres and UNEP are establishing a new international forum for collaboration and information sharing by institutional investors on climate risk.

In another ominous sign for chief executives and board members, some experts in corporate governance say company officers could be held accountable for failing to protect their companies from climate-related risk. And the lawsuits could come from governments as well as investors **and other aggrieved parties.** Peter Lehner, chief of the New York attorney general's Environmental Protection Bureau, said the bureau was studying the issue of climate change and might sue polluters along the lines of the successful tobacco litigation by states in the 1990's.[78]

Risks of Higher Insurance Costs and Burdens

Perhaps the greatest pressure for change, however, will come from the insurance industry. As described above, the insurance companies are already being battered by losses from the increase in the violence of storms. In 2003, *The Wall Street Journal* reported that,

> With all the talk of potential shareholder lawsuits against industrial emitters of greenhouse gases, 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 doing enough to reduce their output of greenhouse gases.[79]

In March 2004, Reuters reported: "The world's second largest re-insurer, Swiss Re, warned … that the costs of natural disasters, aggravated by global warming, are spiraling out of control, forcing the human race into a catastrophe of its own making."[80]

In the Fortune Magazine article "Cloudy with a Chance of Chaos,"[81] author Eugene Linden reported,

> Already the pain of weather-related insurance risks is being felt by owners of highly vulnerable properties such as offshore oil platforms, for which some rates have risen 400% in one year. That may be an omen for many businesses. Three years ago 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, implying that an enormous number of companies have off-balance-sheet risks related to weather—even without the cataclysms a flickering climate might bring.

In 2004, Swiss Re, a $29 billion financial giant, sent a questionnaire to companies that had purchased its directors-and-officers coverage, inquiring about their corporate strategies for dealing with climate change regulations. D&O insurance, as it is called, insulates executives and board members from the costs of lawsuits resulting from their companies' actions;

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[76] Ibid.
[77] CERES website, www.ceres.org/pub/, 1 August 2006.
[78] Press Statement of Peter Lehner Chief of Environmental Protection Bureau, New York State Attorney General's Office Re: Corporate Governance and Climate Change: Making the Connection, at website: www.ceres.org/news/news_item.php?nid=57, 1 August 2006.
[79] Jeffrey Ball, Wall Street Journal, 7 May 2003.
[80] Thomas Atkins, "Insurer warns of global warming catastrophe", Reuters, 3 March 2004.
[81] Eugene Linden, "Cloudy with a Chance of Chaos", *Fortune Magazine*, Tuesday 17 January 2006, money.cnn.com/2006/01/17/news/economy/climate_fortune/index.htm, 30 October 2006.

Swiss Re is a major player in D&O reinsurance.

What Swiss Re is after, says Christopher Walker, who heads its Greenhouse Gas Risk Solutions unit, is reassurance that customers will not make themselves vulnerable to global-warming-related lawsuits. He cites Exxon Mobil as an example: The oil giant, which accounts for roughly 1% of global carbon emissions, has lobbied aggressively against efforts to reduce GHGs. If Swiss Re judges that a company is exposing itself to lawsuits, says Walker, "We might then go to them and say, 'Since you don't think climate change is a problem, and you're betting your stockholders' assets on that, we're sure you won't mind if we exclude climate-related lawsuits and penalties from your D&O insurance.'" Swiss Re's customers may be put to the test soon in California, where Governor Arnold Schwarzenegger is pushing to restrict carbon emissions, says Walker. A customer that ignores the likelihood of such laws and, for instance, builds a coal-fired power plant that soon proves a terrible bet could face shareholder suits that Swiss Re might not want to insure against.

Alarmed at the sharply rising cost of hurricanes and other disasters, home insurers are pulling back from some U.S. coastal markets, warning of gathering financial storm clouds over how the U.S. pays for the damage of catastrophe. This development is another fallout of Hurricane Katrina, whose mounting toll of destruction along the Gulf Coast has precipitated a growing industry debate about the combined effect of climate trends and population growth in coastal areas. Seven of the 12 costliest insured disasters in U.S. history occurred in the past two years. At $57.7 billion, private insured losses in 2005 were more than double those of 2004. Meanwhile, government-provided crop and flood insurance programs are experiencing rising losses, wildfire events are causing two times more damage compared to a few decades ago and coastal erosion insurance is now entirely unavailable.[82] In March 2006, catastrophe modeler Risk Management Solutions Inc. raised its estimate of insurance losses this year by nearly 50% above pre-2004 baselines for the East and Gulf coasts. The company, whose estimates are used by insurers to calculate premiums, blamed "higher sea surface temperatures."[83]

Credit Risks

Rating agencies are putting large insurers such as Allstate and State Farm on notice for possible ratings downgrades. Significant premium increases, tightening terms and market withdrawals are sure to come next. Companies are shedding homeowner's policies and driving residents to taxpayer-funded state insurance plans:[84]

Florida's Citizens Property Insurance Corp., for example, has 815,000 policyholders and is adding 40,000 a month.

Poe Financial Group collapsed in 2005, and many of its 316,000 policyholders probably will move to Citizens, which already faces a $1.7 billion deficit.

Since 29 August 2005, when the Katrina hurricane hit along the Gulf Coast, Allstate Corp., the industry's second-largest company, has ceased writing homeowners policies in Louisiana, Florida and coastal parts of Texas and New York State. They have stopped underwriting earthquake coverage in California and elsewhere.

Louisiana Citizens Property Insurance Corp., the state's last-resort insurer, expects to reach 200,000 policies this year; it had none in 2004. Texas' insurer of last resort says it is down to $1.3 billion in reserves and wants to raise rates by at least 22%.

Homeowners are moving to state-backed insurer plans of last resort, whose costs are rising. Taxpayers, who subsidize such plans, are already feeling the impact. While Katrina caused an estimated $38-$50 billion in private insured losses, it also cost the federal flood insurance

[82] "Insurers see more disasters due to climate change," Planet Ark, website: www.planetark.org/dailynewsstory.cfm/newsid/13100/story.html, 27 July 2006.
[83] "Insurers Retreat From Coasts: Katrina Losses May Force More Costs on Taxpayers," By Spencer S. Hsu, Washington Post Staff Writer, Sunday, 30 April 2006; A01, www.washingtonpost.com/wpdyn/content/article/2006/04/29/AR2006042901364_pf.html, 27 July 2006.
[84] Ibid.

program $50 billion and prompted federal relief spending of more than $100 billion.[85] That includes about $10 billion for Mississippi and Louisiana homeowners.

Governments assume a considerable share of the exposures to the costs of weather-related events. Requests for all forms of disaster relief (including those for the agriculture sector) doubled between the mid-1980s and mid-1990s and total federal disaster-related payments amounted to $120 billion between 1993 and 1997. Federal aid for Hurricane Katrina alone is anticipated to top $200 billion.[86]

Climate stresses will place more political and financial burden on federal and local governments as they assume broader exposures and are pressured to serve as insurers of last resort. Governments also are compelled to address events for which there is no insurance at all, while paying for disaster preparedness and recovery operations. For example, federal and local governments are incurring substantial liability and expenses due to landslides in southern California, with losses averaging $100 million per year.[87] Business and consumers will be burdened because cash-strapped governments generally cap paid losses and shift greater portions of risk back to consumers.

Conclusion

There is a business case for aggressively moving to limit emissions of the gasses that are changing the climate, and companies are implementing it. Books like the international bestseller, *Natural Capitalism* and a staggering array of others prove how the rapidly emerging best practice in sustainable technologies can meet basic human needs around the world and solve most of the environmental problems facing the planet *at a profit*.

There are enormous risks to companies and communities that do not participate in such programs.

This manual describes how your community can work with its business community to enable citizens and companies to capture these advantages, and avoid these risks.

[85] Ibid.
[86] Ibid.
[87] Ibid.

Additional Resources

Chicago Climate Exchange: To learn more about the potential to engage in carbon trading, visit: http://www.chicagoclimatex.com/

The city of Portland offers information about its climate action and many other sustainable development activities at www.sustainableportland.org

Visit the Smart Growth Network at http://www.smartgrowth.org/ for more information about alternatives to urban sprawl.

For more information about shading parking lots, see: http://www.fs.fed.us/psw/programs/cufr/products/3/cufr_151.pdf

Environmental Protection Agency: EPA maintains a section for health professionals on its global warming web site: http://yosemite.epa.gov/oar/globalwarming.nsf/content (August 2006)

U.S. Global Change Research Program: This government program offers hotlinks from it web sites to a number of other sites and publications on the health impacts of global warming: http://www.usgcrp.gov/usgcrp/nacc/health/default.htm

The Harvard Medical School's Center for Health and the Environment offers a variety of analyses, educational papers and Powerpoint presentations on the health impacts of climate change. See http://chge.med.harvard.edu/index.html (August 2006)

At the United Nations Conference on Climate Change in December 2005, more than 300 mayors from around the world endorsed the World Mayors and Municipal Leaders Declaration on Climate Change. It addresses the responsibility of municipalities to mitigate and deal with the effects of global warming, including its public health impacts. See http://www.iclei.org/index.php?id=2447

The Utah Energy Office offers good information about urban heat island effects, and sample educational and campaign materials for children. See http://www.nef1.org/ea/koolkids/overview.html

American Forests' web site offers information about urban tree planting programs, including educational activities for youth. Visit the site's information about CITYgreen is a software tool that helps people understand the value of trees to the local environment. Planners and natural resources professionals use the program to test landscape ordinances, evaluate site plans, and model development scenarios that capture the benefits of trees: http://www.americanforests.org/

For information about capturing landfill methane, visit the EPA's Landfill Methane Outreach Program at http://www.epa.gov/lmop/

Climate Change Futures (CCF) Project: Health, Ecological and Economic Dimensions (CCF) project examines the physical and health risks of climate instability. CCF is a three-year effort by the Center for Health and the Global Environment at Harvard Medical School,and is supported by Swiss Re and the United Nations Development Programme. Key findings of the study will be presented Tuesday, November 1,2005, at the American Museum of Natural History in New York, New York.

This project is enique because:

- Involves corporate stakeholders directly in the assessment process.
- Offers multi-dimensional projections and recommendations for the coming five to ten years, unlike other assessments with projections far off into the future
- Takes a broad view of health, focusing on human diseases, while including diseases and infestations affecting natural systems that can have profound economic effects via the loss of resources and the services the environmental systems provide.
- Brings together the wisdom of a multi-sectoral group of researchers (public health professionals, veterinarians, specialists in agriculture, marine biology, forestry, and climatology), and representatives from the corporate, NGO and United Nations sectors to assess the emerging pattern of risks.
- Uses climate scenarios that explore the possibility of much greater variance and the growing potential for surprises and shifts that could have the greatest overall impact on human health and well-being.
- http://www.climatechangefutures.org/

NATURAL CAPITALISM SOLUTIONS

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