

A CASE FOR ENVIRONMENTAL INVESTING

Scotia Global Climate Change Fund

Scotia Global Climate Change Fund

– Approach to Change

Current Landscape

Climate change is going to affect the way we live. It will affect everyone, everywhere. And the reality is that it is here today.

But this issue goes beyond social responsibility. Global climate change will have significant long-term financial impact on capital markets as companies across all sectors respond to the increased business risks stemming from this development. This presents investors with a real opportunity to capture enhanced returns, as companies that are best positioned to profit from adaptation and mitigation of climate change effects become compelling investments.

Scotia Global Climate Change Fund is a proactive response to the climate change issue. Climate change is a complex and continually evolving reality that will have both a financial and regulatory impact on a variety of businesses.

For example, legislation will soon require carbon dioxide (CO₂) emissions to carry a defined price. As CO₂ becomes monetized, companies that are better able to manage their CO₂ output may experience lower costs of doing business. Companies that embrace these developments within their business model by implementing stronger environmental business practices will potentially have greater returns of shareholder capital over time in comparison to their competitors who are not prepared to deal with the impacts of climate change.

Strong Long-Term Investment Strategy

Scotia Global Climate Change Fund is advised by State Street Global Advisors (SSgA), one of the largest institutional investors in the world, managing over \$2 trillion in assets. Managed by SSgA's dedicated Environmental, Social and Governance Investment Team led by Bill Page, the fund offers diversified exposure to companies that can capitalize on climate change action. The investment strategy is long-term and is designed to leverage the technologies and environmental practices that will help companies mitigate and adapt to the implications of climate change. The strategy:

- evaluates companies over a three to five year period using a disciplined, integrated review of environmental and financial criteria, with comprehensive research inputs from a variety of leading-edge industry sources
- diversifies across nine climate change themes that cover all economic sectors, enabling the fund to capitalize on a broad universe of opportunities while reducing the risk associated with a narrower investment mandate.

Nine Climate Themes

Clean Fuels: ethanol, cellulosic ethanol, biodiesel, agricultural efficiency

Clean Technology & Efficiency: smart energy transmission, end-user energy efficiency

Efficient Transport: automotive, freight

Environmental Finance: carbon finance

Power Technology: power management, hydrogen, distributed energy

Power Merchants & Generation: natural gas, nuclear

Renewable Energy: wind, solar, biomass, geothermal, hydro

Sustainable Living: health care, communications, sustainable retail

Water: filtration, distribution, systems

- invests globally across the market capitalization spectrum holding a focused list of diversified larger cap companies that are exposed to multiple climate themes, as well as smaller, specialized companies that have leading technologies
- leverages SSgA's deep pool of investment analysts

Investment Process

Initial Screens

- Initial screen of over 1,000 global companies is conducted by focusing on companies with at least a \$300 million market capitalization, positive sales growth and appropriate liquidity
- Screen for exposure to the nine climate change themes and strong Innovest rankings (Innovest is a research firm dedicated to global environmental, social and governance analysis)

Analysis and Research

The resulting universe of about 300 companies are subject to deeper fundamental evaluation and ranking for investment consideration.

STEP 1: Environmental Analysis

- Companies are ranked using Innovest environmental investment criteria which determines levels of environmental performance, considering environmental products and services offered as well as operational opportunities
- Companies are assessed based on their level of exposure to the nine climate themes
- Climate governance is weighed, assessing the extent to which the company is financially committed to mitigating global climate change

STEP 2: Financial Analysis

- Stocks are analyzed from both an environmental and financial perspective, with stock valuation figuring prominently in the fund's investment process
- The companies are ranked according to:
 - Sales growth
 - Valuation (price to sales, price to cash flow measures)
 - Capital efficiency (return on invested capital, free cash flow)

STEP 3: Global Analyst Conviction

- Environmental and financial rankings are cross-referenced with SSgA's Global Fundamental Strategies (GFS) Group's global industry analysts model portfolios
- Companies that also rank highly with the GFS analysts will have the greatest portfolio weight
- Companies that rank high on environmental factors yet lower with the GFS analysts will be given less weight in the portfolio

STEP 4: Portfolio Construction

- Aims for diversification across each of the nine climate themes
- Although not benchmark sensitive, the fund is managed with an awareness of the MSCI World Index and the KLD Global Climate 100 Index
- Position weights range between 1% and 3%
- Targets between 65 to 75 companies poised to benefit from climate change action

Power of Change

As climate change continues to have an impact globally, we believe that making investments in this long-term growth area will produce strong, long-term performance, while demonstrating a commitment to investing in companies who are taking effective mitigation and adaptation action against this global reality.

Access the power of change through the Scotia Global Climate Change Fund.

Portfolio Management Team



Bill Page

Vice-President & Head of ESG Investments

Bill also manages the Socially Responsible Equity Strategy. Bill is a participant on the Global Roundtable on Climate Change at Columbia University, and supporter of the Carbon Disclosure Project and Ceres. Bill is a member of the Environmental Management System team for State Street's Corporation and a member of State Street's Corporate Social Responsibility Committee, which integrates ESG into State Street's business activities. Bill has been working in the investment management field since 1986 and holds a Bachelor's degree in Economics from Boston University and an MBA from the F.W. Olin School of Business at Babson College.



Matthew Griswold

Vice-President

Matt is a member of the ESG Investment Team and works in the Global Fundamental Strategies group as an ESG portfolio manager. His responsibilities also include managing the Socially Responsible Equity Strategy. Matt has been working in the investment management field since 1989, holds a BS in Industrial Management from Carnegie Mellon University and his CFA designation.



Christopher McKnett

Principal

Chris is a Product Engineer for ESG strategies and is responsible for vendor selection, integrating ESG issues and product development and maintenance. Chris has worked in the investment field since 1999, holds a BSBA from the University of Connecticut and an MBA from Daniels College of Business at the University of Denver.

A Case For: Environmental Investing

Overview

Climate change continues to attract discussion and coverage in mainstream publications such as the *Wall Street Journal* and the *Financial Times*¹. The discourse on climate change has evolved from whether it actually exists to a tacit understanding that it is in fact occurring and how governments, businesses and civil society should react. Environmental investing was once viewed as a niche area and a way to control risk. However, as awareness of climate change has risen, the view has changed to one of opportunity. As more and more governments, businesses, and individuals respond to climate change, we believe that investment opportunities will continue to emerge. We examine the issues surrounding climate change and the potential opportunities that exist as a result.

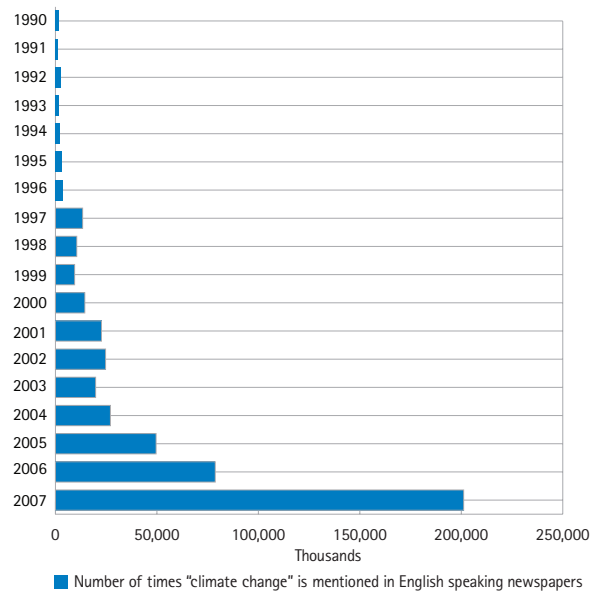
Addressing Climate Change

Unmitigated climate change is now estimated to cost at the high end of estimates as much as 20% of global GDP in 40 years². Inaction is no longer an option. Recognition of our dependence on carbon intensive energy and the decades required to reverse our imprint on the environment is driving many forward-looking business leaders and investors to adopt a long-term approach towards climate change.

Our effect on global surface and sea temperatures has accelerated, deepening risks and opportunities that may impact capital markets throughout the next several decades. Although the Street still fails to account for much beyond the quarter, including both the risk and opportunity of firm position relative to climate change, the perceived dichotomy that an economic system is a trade-off between environmental health and economic prosperity is no longer viable.

The drivers of this investing are many. A bevy of comprehensive reports have pointed to humans' effect on climate change; through legislation, we expect that a price on carbon is forthcoming; and new innovations are delivering a wealth of opportunities for investors. The case for investing in the environment is couched on an understanding of climate change research, policy recommendations, company risks and opportunities, and a shared responsibility to sustain resources for future generations.

Exhibit 1: News Flow on Climate Change Clearly Picking Up



Source: Factiva

Climate change presents several types of business risk. The likelihood and intensity of each risk type varies by sector and geography, but principal risks include:

- **Supply Chain** – identifying and measuring a company's exposure to suppliers that could pass along higher costs from their dependence on fossil fuel energy and carbon-intensive raw materials.
- **Reputation** – retaining a positive company image on climate change, understanding exposure from current impacts on the environment.
- **Litigation** – mitigating exposure to potential lawsuits from greenhouse gas ("GHG") emissions.
- **Regulatory** – pending national and existing global laws constraining emissions.
- **Physical** – increased frequency and intensity of storms, droughts, floods, and other catastrophic events on property and life.

Companies that have thoroughly assessed their exposures to these risks may be better positioned versus those that have not.³ Pressure and the tools available to conduct an assessment are on the rise.

¹ September 10 – 19th, 2007, Wall Street Journal, Financial Times

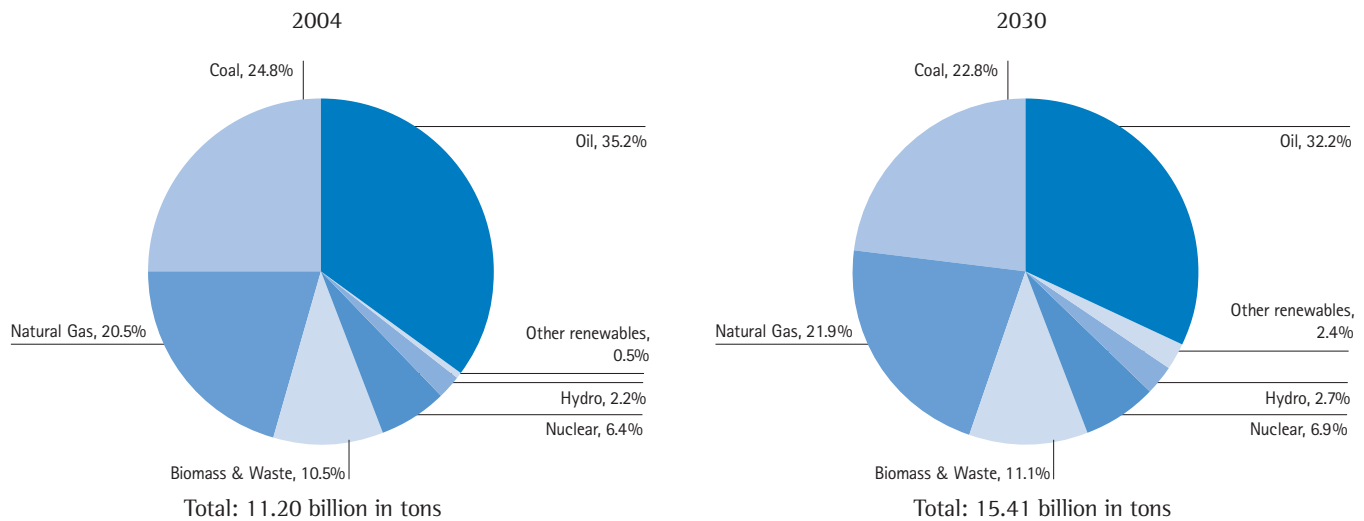
² Stern Report

³ Jonathan Lash and Fred Wellington, "Competitive Advantage on a Warming Planet," *Harvard Business Review*, March 2007, \

Environmental Impacts

Accelerating GHG emissions are compounded by increasing global demand for energy, with global energy demand expected to rise over 35% by 2030.⁴

Demand in 2004 and 2030; totals are in metric tons of oil equivalent



Source: International Energy Agency's World Outlook 2006

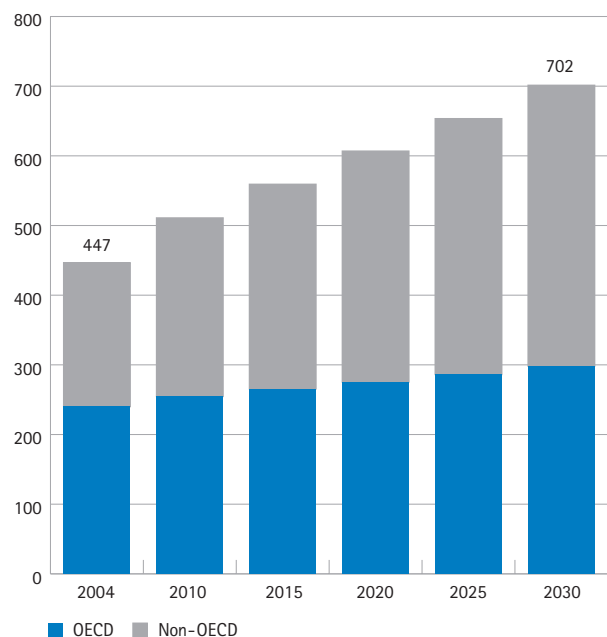
We believe the fastest growth in energy demand will be from energy-starved developing countries.

At present, the majority of global electricity supply is from carbon-intensive sources such as coal-fired power plants. Coal is estimated to provide nearly 50% of America's electricity, 70% of India's and 80% of China's.⁵ While energy supply from renewable sources is projected to grow faster on a percentage basis, consensus forecasts are for fossil fuels to still account for roughly 75% of supply in 2030 compared to just over 80% in 2004, as shown in the chart above.

The Intergovernmental Panel on Climate Change (IPCC),⁶ a scientific intergovernmental body established by the World Meteorological Organization and by the United Nations Environment Programme, punctuates our effect on climate change, concluding "most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (human) GHG concentrations."⁷

Clearly, economy-wide solutions that extend beyond the energy mix are critical for successful mitigation and adaptation. For example, warming and extreme weather volatility confers physical risk on life and property and also threatens wildlife, livestock, agriculture, forests and marine life which

World Marketed Energy Consumption by Region, 2004-2030 (Quadrillion BTU)



Source: "International Energy Outlook 2007", Energy Information Administration, 27 May 2007

⁴ International Energy Agency

⁵ Dirty king coal," *The Economist* 31 May 2007

⁶ "About IPCC," <http://195.70.10.65/about/index.htm>, 23 November 2007

⁷ Intergovernmental Panel on Climate Change "Climate Change 2007: The Physical Science Basis," IPCC AR4 WG1

provide us with essential resources and constitute our life-support systems.⁸

Economic repercussions for large GHG contributors are imminent. A 2007 study published in the *Stanford Environmental Law Journal* suggests a company's disproportionate GHG emissions could link them to damages from climate change.⁹ As carbon costs are internalized, insurers and reinsurers will increasingly price their client's exposure into policies, causing prices to rise and in some cases, insurance to be unavailable.

The scale of the climate challenge is beyond the scope of any single industry or strategy. There is no killer application or silver bullet because of warming inertia. Due to a lag effect, accumulated GHGs will continue to rise for years even if we hold emissions constant beginning immediately and going forward.

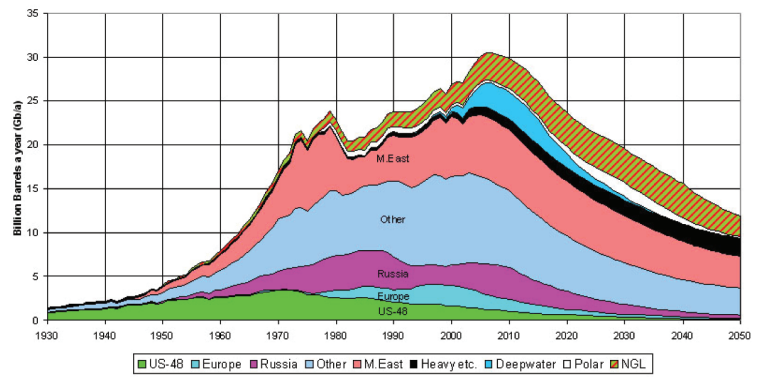
Oil and Water Scarcity

Despite the growth in clean energy and technologies, increased awareness of climate change, and significant risk associated with oil dependence, oil demand is expected to continue without any foreseeable major global increase in supply.

At the same time, economic growth remains highly linked to cheap and abundant energy supply, especially precious oil resources. Therefore, any adaptive solution to reduce demand for oil can create real economic growth. Efficiencies and alternative energy become ever more pressing as we approach a critical turning point in the availability and price of oil, a theory known as peak oil.

Peak oil is the halfway point of all oil reserves. Production becomes ever more likely to decline after this point, simply because there is not a supply of cheap oil to keep pace with demand. As the most readily accessible stores are extracted first, the remaining supplies can take more energy to extract than the energy it would produce. By many estimates the U.S. already passed the peak oil point during the 1970s energy crisis. Globally, the prediction is for 2010.¹⁰

Oil and Gas Liquids
2004 Scenario



Source: Cooperman, Gene, College of Computer and Information Science, Northeastern University

Similarly, much of the global population is without adequate water supply. Under the most dire scenario, one-third of the global population lacks reliable access to clean water.¹¹ By 2025, 1.8 billion people will live in countries with "absolute water scarcity."¹² The IPCC expects water availability to be highly vulnerable to anticipated climate change.

As the supply of oil and water approaches a limiting point, global society will look for ways to adapt to continue economic growth. We believe investment in strategies that offer more efficient use of existing resources and make use of alternative energy stand to flourish.

Opportunity

Climate change investing began as a risk management issue, and while the environmental and economic risks cannot be overstated, the leading edge of the market has begun to view the challenge as a source of opportunity. According to *The Economist*, "Climate change... will provide new opportunities – new markets, new technologies, new businesses and new money to be made. This could be disruptive. If carbon controls are tightened, the companies that will flourish are those that have positioned themselves well."¹³ In short, evidence increasingly suggests that global warming will create winners and losers.

Notable are the sectors that contribute the greatest amounts of GHG emissions. These sectors present the largest downside risk because they have the highest GHG

⁸. "Climate Change Futures, Health, Ecological and Economic Dimensions," The Center for Health and the Global Environment Harvard Medical School, November 2005

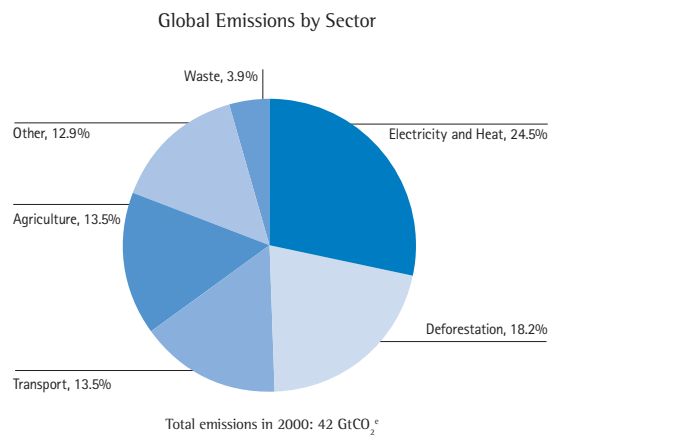
⁹. C. Ross, E. Mills, S. Hecht "Limiting Liability in the Greenhouse: Insurance Risk-Management Strategies in the Context of Global Climate Change," *Stanford Environmental Law Journal*, Vol. 26A (2007): 251

¹⁰. C.J. Campbell "Industry Urged to Watch for Regular Oil Production Peaks, Depletion Signals," *Oil and Gas Journal*, 14 July 2003

¹¹. International Water Management Institute

¹². United Nations Environment Program, "Global Environment Outlook: environment for development," GEO-4, 25 October 2007

¹³. Emma Duncan, "Cleaning Up," *The Economist*, 31 May 2007



Source: Stern Review

exposure. At the same time, on a peer basis, early climate movers in these sectors present upside opportunities.

Environmental investing seeks to profit from companies that are proactive in mitigating their exposure to climate change as well as adapting to its affects. Firms positioning themselves to capture new markets created by demand for mitigation and adaptation tools are likely to experience high growth potential.

Developing U.S. Climate Change Legislation

Globally, a majority of developed nations already have some form of climate related legislation with binding emission targets, and as of November 2007, 175 nations had ratified the Kyoto Protocol. Given that the U.S. is the world's largest emitter of carbon dioxide (CO₂), stabilization and reduction of global GHGs is not realistic without active U.S. engagement and participation in a post Kyoto protocol framework. As political, economic and environmental pressure intensifies, we expect the U.S. to pass legislation limiting GHG emissions and to endorse a global framework for emissions reductions.

Twenty-five states have required utilities to obtain as much as 30% of their electricity from renewable sources within 10 to 15 years. Nearing the end of 2007, 163 U.S. congressional bills mention 'climate change'.¹⁴ Ten major market-based bills introduced to the 110th U.S. Congress seek to price carbon through taxing on emissions or by establishing a cap and trade system.¹⁵ Both pricing mechanisms are directed at upwardly sloping emissions of CO₂ and other GHGs.

Precedent for each federal bill has been set by two main sources: the success of the Clean Air Act that stemmed acid

rain caused by sulfur dioxide, and the measured success of non-U.S. emissions trading systems arising from the Kyoto Protocol. Under a cap and trade system, companies receive emissions credits and GHG quotas. If a company emits less than their allowance they can sell their excess credits to those firms whose emissions exceeded their quota. Effectively, a GHG cap and trade system creates a carbon market by defining a cost to pollute and driving value for alternative energy and energy efficiency. Upstream emitters could experience a temporary windfall if the balance of credits are allocated at no cost or through reduced price auctioning. Longer-term, more efficient firms can generate cash from selling credits to over-exposed buyers.

A New Marketplace for Carbon

Although other GHGs have greater global warming potential on a unit basis, legislation and emissions trading schemes are focused on the majority of GHG emissions CO₂.

The creation of a robust carbon market provides an opportunity for intermediaries to efficiently allocate carbon credits and capital. Globally, the burgeoning carbon trading market is expected to hit \$36 billion by the end of 2007.¹⁶

Ultimately, pricing carbon and other GHGs should have a permanent effect on capital markets and business strategy. According to a 2007 National Petroleum Council report, "policies aimed at curbing CO₂ emissions will alter the energy mix, increase energy-related costs, and require reductions in demand growth."¹⁷ The report goes on to state, "the world will need better energy efficiency and all economic, environmentally responsible energy sources available to support and sustain future growth."

Mitigation and Adaptation

As carbon becomes an internalized cost of doing business, and the demand for new energy resources and efficiencies continues, it is our belief that leaders and laggards will emerge. Firms that reduce their GHG exposure may have an opportunistic lever for growth; conversely, those that wait until compelled by legislation may find themselves permanently behind early adopters.

¹⁴ The Library of Congress, <http://thomas.loc.gov/cgi-bin/thomas> 23 November 2007

¹⁵ "Summary of Market-Based Climate Change Bills Introduced in the 110th Congress," *Resources for the Future*, <http://www.rff.org>, 10 August 2007

¹⁶ PointCarbon, as reported in Wall Street Journal. Abboud, Leila. "Banks See Green in Carbon Projects", *Wall Street Journal*, December 18, 2007; Page C1

¹⁷ National Petroleum Council 2007

Adaptation and mitigation strategies both aim to reduce the effects of climate change. Mitigation strategies are operating product interventions to limit GHG concentrations. Adaptive strategies are adjustments to actual or expected climate change effects. Indeed, markets are being created not only from observed climate change, but also from perceived climate change.

Mitigation

In 2006, former Chief Economist of the World Bank, Sir Nicholas Stern, concluded that the benefits of early action would outweigh the future costs stemming from inaction. Stern states that we can start investing 1% of our GDP each year and remove most of our risk from climate change, staying below 550 parts per million of CO₂, or expect an annual 5-20% GDP loss, from an increase in temperature and subsequent extreme weather, losses to food, water, and the ecosystem. Stern goes on to advocate for the pricing of carbon, development of clean technology, and addressing the market failure in promoting energy efficiencies.

Princeton scholars Robert Socolow and Stephen Pacala have developed a tool for policymakers to select GHG abatement choices, proposing a segmented “wedge” framework for mitigation strategy. Each wedge is part of a multifaceted approach to stabilize carbon emissions at an acceptable level within 50 years. Each stabilization category details wedges to reduce annual carbon emissions by a billion metric tons by scaling up existing technologies for global deployment.

Eight wedges comprise the Stabilization Triangle:

- Extensive energy efficiency and conservation
- Fuel switching from coal electric plants to natural gas
- Carbon capture and underground storage
- Expand nuclear capacity
- Expand wind capacity
- Expand solar capacity
- Increase biofuel production
- Reduce deforestation and increase forest planting¹⁸

This theory provides a road map for innovation and investment that may make activities within these wedges increasingly cost effective and ultimately profitable.

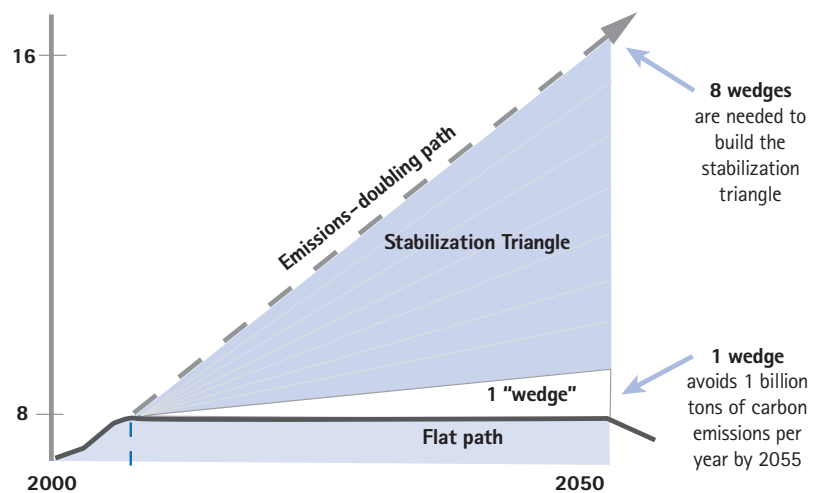
Adaptation

Despite necessary efforts to mitigate climate change, global warming has already been observed and associated effects will continue to be felt into the future even if year-over-year decreases in GHGs are achieved. Adaptation is the only response available over the next several decades before mitigation measures can take effect.¹⁹

There do exist some possible near term benefits from climate change. For example, traditionally cooler climates could see an increase in crop yields and tourism. However, any benefit will be fleeting and ultimately pale in comparison to the long run costs, particularly those externalized on the developing world which has “limited adaptive capacities, and more dependence on climate sensitive resources such as local water and food supplies.”²⁰

Still, there is cause for some optimism. In China a number of adaptive strategies are already at work including more than \$3 billion spent on flood control between 1960 and 2000 that is estimated to have averted losses of some \$12 billion.²¹ China also intends to build 375 wastewater treatment facilities in the next five years and 80% of China’s hot water is now solar thermal.²²

Developed countries have also successfully used adaptive strategies. In Australia, where wheat yields are highly reactive to climate change, adaptive strategies like GPS-assisted harvesting equipment, minimized tilling, use of drought tolerant wheat varieties and changes in planting dates and



Source: 2007, Princeton University, Carbon Mitigation Initiative

¹⁸ S. Pacala and R. Socolow, “Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies,” *Science* 305 (2004): 968-72

¹⁹ Nicholas Stern, “Review: The Economics of Climate Change: The Stern Review,” January 2007, 403

²⁰ Intergovernmental Panel on Climate Change, “Working Group II: Impacts, Adaptation and Vulnerability Summary for Policymakers,” 6 April 2007, Summary for Policymakers,” 6 April 2007,

²¹ Nicholas Stern, “The Economics of Climate Change: The Stern Review, January 2007, pg 434

²² Kenny Tang, “The Global Water Crisis: Innovations to Watch For,” *The Wall Street Journal* 24 September 2007, “Sunlit uplands,” *The Economist* 31 May 2007

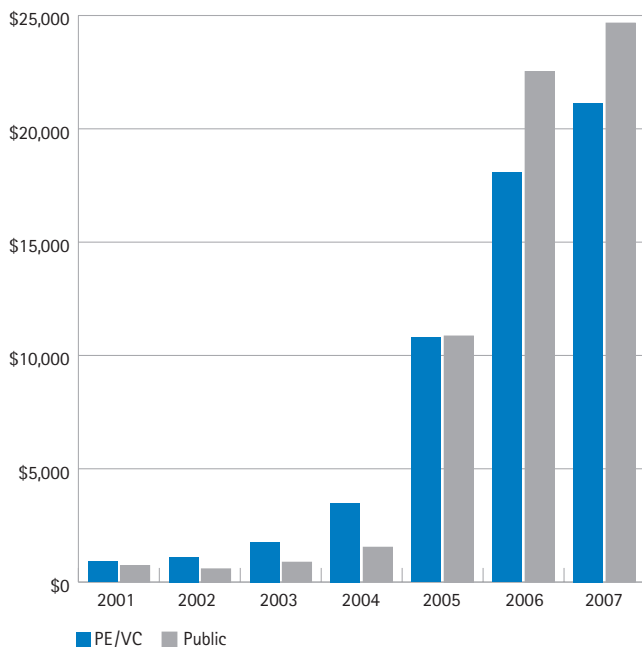
watering have increased efficiency and brought yields back up 30% over the last 10 years.²³

As the capital markets awaken to the demands of climate change, we believe opportunities will increase for both adaptive and mitigated solutions. The rise of clean energy and technology is one example of capital markets already beginning to acknowledge global climate change.

Clean Energy and Technology

Market support for mitigating solutions is evident by a rise in funds for developing environmental technology solutions in the energy, agriculture, information technology, and transportation industries. New Energy Finance, a research and consulting firm, estimates that private and venture capital investment in clean energy accelerated 67% from 2005 to 2007.²⁴

Clean Energy Investment from 2001 to 2007 (\$ Millions)



Source: New Energy Finance, 2007

²³ Climate Change Risk and Vulnerability" Department of the Environment and Heritage Australian Greenhouse Office, March 2005

²⁴ New Energy Finance reported \$18.1bn in Private Equity and Venture Capital clean energy investment in 2007, up from \$10.8bn reported in 2005

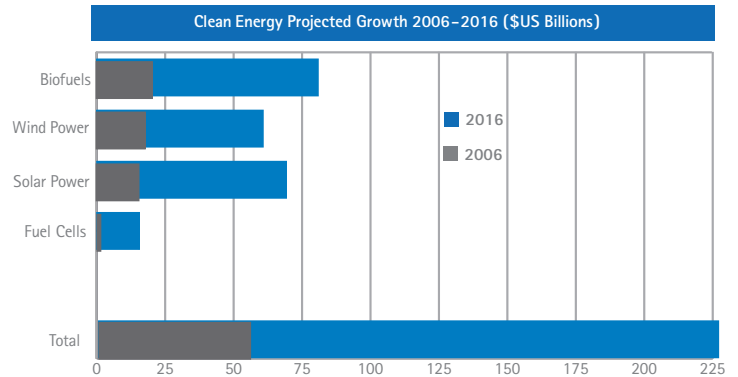
About the Author

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Principal

Chris is a Product Engineer for ESG strategies and is responsible for vendor selection, integrating ESG issues and product development and maintenance. Chris has worked in the investment field since 1999, holds a BSBA from the University of Connecticut and an MBA from Daniels College of Business at the University of Denver.

A small increase in demand for clean technologies has a tremendous potential for new revenue growth. CleanEdge, Inc. expects revenues related to four principal clean energy technologies to grow more than 300% in the next ten years, as shown in the chart below.



Source: CleanEdge, 2007

Conclusion

Awareness of the environmental and economic impacts of climate change is now reflected in boardrooms, portfolios and policy decisions. Opportunities for competitive advantage through reduced GHG exposure or profit opportunities resulting from mitigation and adaptation are poised to be a long-term secular trend. As GHGs are monetized and essential natural resources become increasingly scarce, businesses and investors must navigate emerging risks and opportunities that are not easily quantified. An environmental investment strategy recognizes these risks and opportunities as an additional fundamental measurement of a company's potential to create or destroy shareholder wealth.

For more information please call:

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