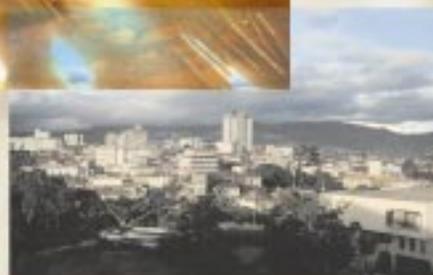


SAFE CLIMATE SOUND BUSINESS

AN ACTION AGENDA



CLIMATE
PROTECTION
INITIATIVE



MONSANTO
Food • Health • Hope™



WORLD RESOURCES INSTITUTE

FOREWORD

The world today faces dual challenges of protecting the Earth's climate while expanding global economic prosperity. Both goals are vital to the continued improvement in human well-being. Our four institutions have worked closely together over the past 18 months to explore how these two goals can be achieved. We call our effort the "Safe Climate, Sound Business Initiative" and this document summarizes our principal findings.

Our collaboration is unusual in several ways. First, it addresses the fundamental and linked issues of global energy supply, climate change, and economic growth through the end of the next century. By analyzing long-term scenarios, we explore how to meet the growing needs for energy while putting society on a path to stabilizing carbon dioxide concentrations at levels that reduce the risks of climate change. As part of this review, we examine the role and responsibilities of business, as well as the opportunities to develop and market high-efficiency, renewable-energy, and sequestration technologies. We specifically assess the opportunities that climate protection might create for technologies under development by the business partners. We conclude that there will be major business opportunities in reducing climate change risks, but that significant barriers to sensible action lie ahead. To overcome these barriers, it is critical that governments provide a supportive policy environment.

Finally, we conclude that the time is right to take precautionary actions. Leadership and commitment to action now are necessary to address the climate challenge. We have developed a set of recommendations for government and for the business community along with contributions and efforts by environmental organizations. We have made a joint commitment to follow our own recommendations for business and to work together toward the adoption of the recommendations for governments.

Each of our organizations has undertaken a number of initiatives to sequester CO₂ and reduce current and future emissions of greenhouse gases. The "Next Steps" section of this report outlines a Safe Climate, Sound Business Action Agenda that we intend to develop further in the next phase of this collaboration.

We hope that this cooperative effort inspires additional business and environmental organizations, as well as government agencies and other stakeholders, to engage constructively in the climate debate and to undertake similar commitments.

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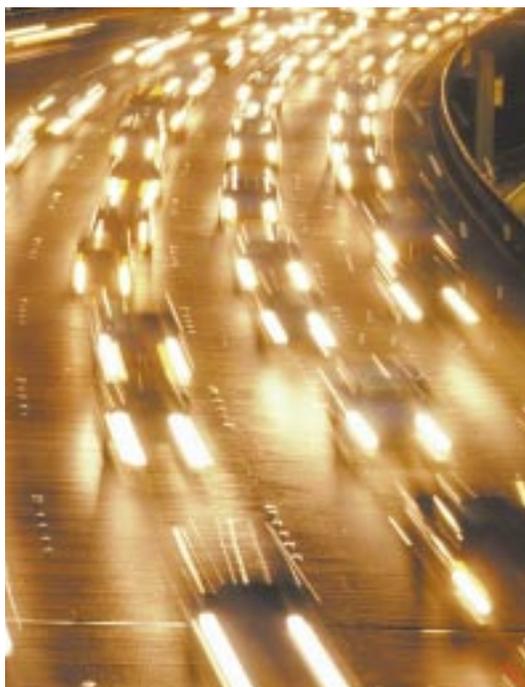
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BRITISH PETROLEUM

their annual average emissions between the years 2008 and 2012 to a percentage of the 1990 level. For the United States, the requirement is a 7 percent reduction; for the European Union, an 8 percent reduction; and for Japan, a 6 percent reduction. Although the requirements vary by country, the net reduction across industrial countries is about 5 percent below 1990 levels, which is roughly 25 percent below the emissions levels projected without the Protocol. As of September 1998, 57 of the 174 countries that are parties



to the Framework Convention on Climate Change have signed the Protocol, including the European Union, Japan, Canada, China, and Brazil. One country—Fiji—has ratified the Protocol. The treaty enters into force when 55 countries have ratified it and when the Annex I countries that have ratified it account for 55 percent of 1990 CO₂ emissions from that group. Although many issues remain to be resolved, Kyoto is another step in a long journey to safeguard the Earth's climate.

Clearly, a broad portfolio of policies will be needed to meet the challenges presented. Finding policy and business options that allow cost-effective greenhouse gas emissions reductions and carbon sequestration will help minimize costs. Policies that support energy efficiency, technology development, and sequestration are key ele-

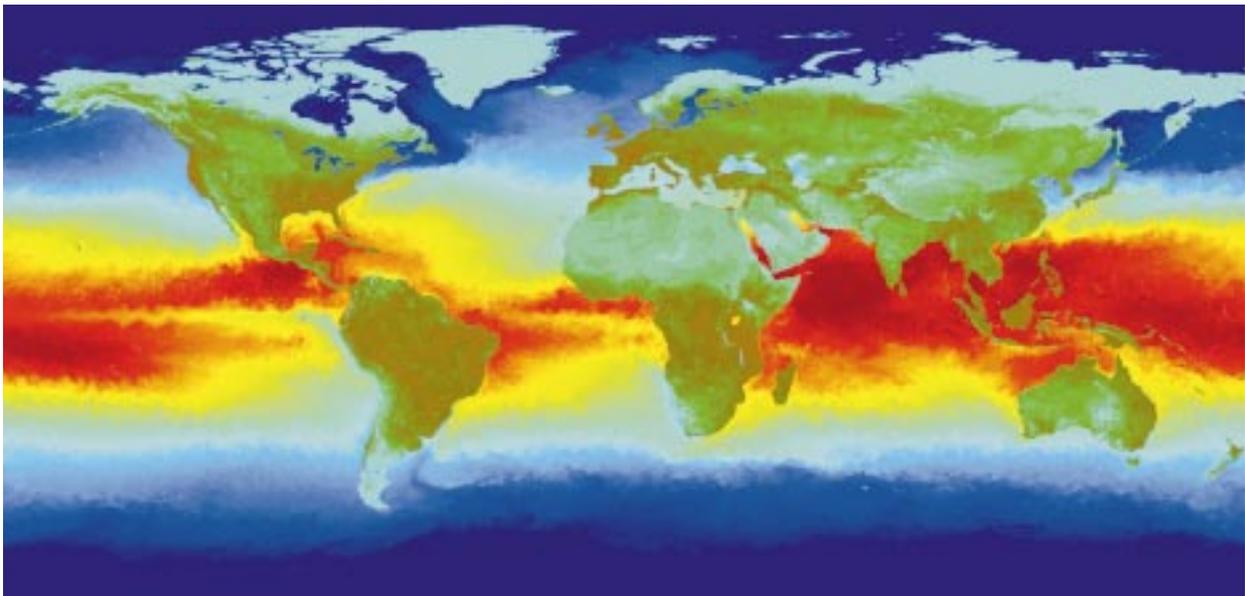
ments in the safe climate pathway we seek.

Governments, industry, and environmental organizations face a series of challenges on which they must work together to arrive at the best outcome.

- **Energy demand** will continue to grow with increasing population and economic prosperity. The challenge is to meet this demand in a sustainable manner, gradually moving to an energy future with less pollution and fewer greenhouse gas emissions. However, incentives for consumers to conserve energy or adopt renewables exist in only some parts of the world, and there are even fewer incentives to sequester carbon.

[PHOTO] Energy demand will continue to grow.

- *The global nature* of the environmental challenge means that developed and developing countries must both be engaged in a concerted effort to control emissions without compromising their economic and social development objectives. Although industrialized countries that ratify the Kyoto Protocol will lead with specific reduction commitments, these gains will be lost if emissions increase uncontrolled elsewhere. Many developing countries are already implementing policies that meet national needs and reduce carbon emissions, by decreasing fossil fuel subsidies, for example. These efforts need to be supported and expanded if the world is to succeed in stabilizing atmospheric greenhouse gas concentrations.
- *The long-term nature* of the challenge requires the identification of durable policy pathways that can maximize sustainable economic development and environmental protection. Balancing complex environmental, energy, and economic priorities and implementing measures that confer multiple benefits—in contrast to the single-dimensional approaches of the past—will help to build a broad public consensus within and among nations to support those measures.



[PHOTO] The global nature of the environmental challenge requires concerted effort by developed and developing countries.



Much can be done to meet these challenges by improving opportunities for commercialization and diffusion of existing technologies and carbon sequestration options. Yet in the critical areas of low-carbon energy sources, renewables, and energy efficiency, it will take time for new technological breakthroughs to be achieved, for new products to be developed, and for those products to penetrate markets. Because of the long atmospheric lifetimes of greenhouse gases, the lag time between actions that reduce emissions and their removal from the atmosphere is significant. An early and gradual transition that steers investments toward climate-protective technologies can minimize environmental risk and the build-up of carbon-intensive capital stock. Such a transition can also avoid the need to retire existing equipment prematurely and can reduce future costs and risks.

For these reasons we must start now. What is needed most is the confidence—and leadership—to begin meeting these challenges. In partnership with government and other stakeholders, business has a vital role since it develops new technologies and possesses the expertise and resources necessary to deliver many of the solutions we all seek.

GETTING THERE FROM HERE: RECOMMENDED ACTIONS

The climate challenge will give business and industry an opportunity to lead and innovate, by offering products and services that take advantage of markets influenced by climate policy. We believe that industry can contribute to climate protection in a wide variety of ways.

[PHOTO] Opportunities for greater sequestration and efficiency are available now.

BUSINESS

Business has a strategic responsibility to its employees, shareholders, customers, and the public to respond to the global climate issue through the following actions:

- Measure, track, and openly report greenhouse gas emissions from their operations.
- Seize near-term opportunities to reduce and sequester greenhouse gas emissions from facilities, products, and supply chains worldwide.
- Develop new cost-effective technologies, products, and business ventures for minimizing emissions and achieving sequestration in the 21st century.
- Include global climate considerations in new investment decisions in both developing and developed nations.
- Educate employees, customers, suppliers, and other key stakeholders to raise their awareness of climate change issues, their own contribution, and potential response options.
- Participate in the debate on climate change at both the national and international levels and contribute constructively to policy formulation and implementation.



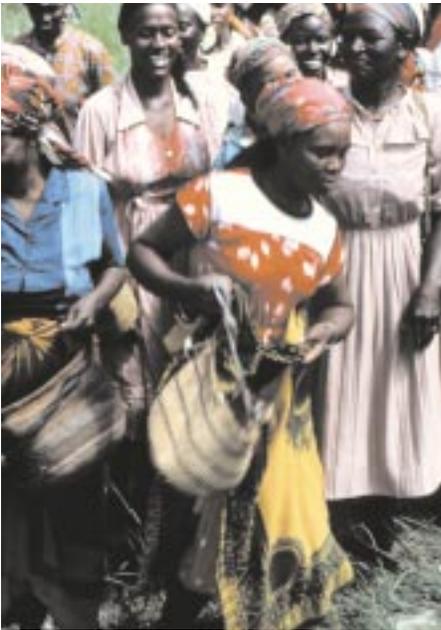
Business can do much on its own, but much more can be achieved in a supportive policy environment that encourages technology development, energy conservation, renewables, carbon sequestration, and early action.

[PHOTO] The climate challenge can give business an opportunity to lead and innovate.

GOVERNMENTS

We see the following governmental actions as essential to reduce the risk of climate change and put society on a long-term path to stabilizing greenhouse gas concentrations:

- Consider potential climate impacts and other social and environmental co-benefits in policy decision-making and resolve conflicts among laws and regulations that deter the attainment of emissions reductions or sequestration.



- Implement market-based mechanisms based on national commitments and eliminate fossil fuel subsidies.
- Increase support for basic research on climate science and economics.
- Expand cooperative industry-government research programs to develop new commercially viable technologies for energy efficiency, alternative fuels, and carbon sequestration.
- Engage the general public, industry, and other stakeholders in a broad discussion to raise awareness and formulate appropriate responses to the global climate issue.

- Establish mechanisms that enable developed and developing countries to implement cost-effective options to achieve sustainable development objectives. In particular, nations should work to identify common policy objectives for cooperation, such as measures to improve air quality or to protect agricultural productivity, that can bring carbon emissions reductions or sequestration as co-benefits.

[PHOTO] Balancing complex environmental, energy, and economic priorities will help to build a broad public consensus.

Environmental organizations will play many important roles in helping business and government carry out these recommended actions. The diversity of these groups means that their contributions to climate protection will range from collaboration with business on practical demonstration projects and joint analyses to public education campaigns and grassroots organizing. We see the following efforts by environmental organizations as key: First, work with business and governments to develop innovative policies and programs that balance economic and climate objectives. Second, conduct and disseminate independent analyses of climate science, economics, and policy. Third, monitor, evaluate, and stimulate progress on the implementation of public policies to protect the environment.

ACTIONS UNDERWAY

SCSB partners are already taking steps to focus on the issue of climate change because it is important not only that we understand the issues but also that we understand and control our own emissions. We have made a joint commitment to follow our own recommendations and to work together toward the adoption of the recommendations for governments.

BRITISH PETROLEUM

BP has already taken several steps forward in understanding and controlling its own emissions. A CO₂ protocol has been developed within the company to standardize measurement procedures. In conjunction with this process, a carbon dioxide management team has been named to identify CO₂ reduction options throughout the BP group of companies. A database of reduction options now comprises over 180 projects with approximately 50 projects tentatively scheduled for 1999. In September 1998, CEO John Browne announced a greenhouse gas target for the company of 10 percent below 1990 levels by 2010.

BP is working with the Environmental Defense Fund (EDF) to develop an emissions trading system and has designed a pilot internal trading system, which was launched in September 1998 with the Oil Trading arm of BP serving as broker. The pilot

system was launched with 12 participating business units coming from wide business and geographic spreads.

BP is also exploring and monitoring the developments of the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI). For example, the Noel Kempff Mercado Climate Action Project in Bolivia, sponsored by the Nature Conservancy, American Electric Power, BP, and Pacificorp, has been sanctioned as an approved JI pilot project by the governments of Bolivia and the United States.

As a major sponsor of a Battelle project to devise an energy technology strategy and as a major investor in solar photovoltaics (PV), BP is seeking to build a new energy marketplace in which it can offer a range of products and services designed to reduce the potential climate impacts of energy use.

Other ongoing collaborative efforts include:

- Continued support for the energy and environment program of the Royal Institute for International Affairs (RIIA).



- Sponsorship of the Massachusetts Institute of Technology Joint Program on the Science and Policy of Global Change.
- BP America work with the U.S. Environmental Protection Agency and U.S. Department of Energy's Climate Wise Partnership Program.
- Chairmanship of the World Business Council for Sustainable Development (WBCSD) climate change working group.

GENERAL MOTORS

General Motors, the largest global automobile manufacturer, agrees that the potential consequences of global climate change are cause for concern and, consistent

[PHOTO] As a major investor in photovoltaics, BP is seeking to build a new energy marketplace.

with its Environmental Principles, require responsible actions. GM has focused on cooperative initiatives in an effort to address global climate concerns through such forums as this Safe Climate, Sound Business Initiative, the President's Council on Sustainable Development, the World Business Council for Sustainable Development, and the Coalition for Environmentally Responsible Economies.

Through its industry association, the American Automobile Manufacturers Association, GM is a sponsor of the MIT Joint Program on the Science and Policy of Global Change. In addition, GM is a member of the Partnership for a New Generation of Vehicles (PNGV) in the United States and EUCAR in Europe, conducting collaborative research and development of a "supercar" by early in the next century. Other important efforts include working with major oil companies to develop cleaner fuels and with suppliers on resource conservation and pollution prevention initiatives.

GM activities focus on technology development and the commitment to create a portfolio of advanced propulsion options for tomorrow that will meet environmental, economic, and customer goals.

- In January 1998, GM unveiled a family of advanced technology vehicles currently under development, including two hybrid propulsion vehicles, a fuel-cell electric vehicle, and a compressed natural gas vehicle. GM plans to have a production-ready hybrid electric vehicle by 2001 and a fuel-cell electric vehicle by 2004.
- GM currently has available for sale to the U.S. public two electric vehicles, the EV1 and the S10 electric pickup, and in the United Kingdom a Combo Dualfuel vehicle using compressed natural gas, and the low-fuel-consuming Chevrolet Metro, rated at 46 mpg.



[PHOTO] GM focuses on technology development to create a portfolio of advanced propulsion options.

Ongoing activities are addressing both the technology and market challenges associated with these vehicles.

GM is also actively pursuing projects to improve energy efficiency and reduce emissions from its manufacturing facilities and supply chain worldwide. Efforts include:

- Incorporating the latest advanced technology for protecting the environment in its new GM Shanghai assembly plant, including recycling built into all processes.
- Participating in the U.S. Climate Wise Program since 1995, including powerhouse conversions, the Green Lights and Energy Star Buildings Programs, and supplier outreach initiatives.
- Certification to EMAS/ISO 14001, Environmental Management Systems, in 19 European sites.
- Continuation of GM's PICOS Initiative on Resource Conservation and Pollution Prevention with suppliers, in operation since 1996, and more recently, forming a Supplier Environmental Advisory Team.
- Distributing a statement in July 1998 of expectations on Environmental Performance Management in GM's Value Chain to 650 suppliers.

GM has been measuring and tracking greenhouse gas emissions data for a number of years and has publicly reported this information.

MONSANTO

Monsanto is a life sciences company with businesses in agriculture, pharmaceuticals, and food products. The company develops and introduces products that could help stabilize atmospheric greenhouse gases by reducing the need for energy, agro-chemical inputs, and resource-intensive practices. Monsanto has developed a climate change policy, is monitoring global developments, and is considering recommendations for appropriate actions.

The company measures and reports carbon dioxide emissions from operations annually in its Sustainable Development Report. It is involved in a number of areas to improve greenhouse gas emission levels both through the use of its products as well as in its own operations.

One important area of focus is conservation tillage, the practice whereby farmers eliminate plowing and instead plant seeds through post-harvest stubble. Plowing, or tillage, exposes the soil to air, releasing carbon and increasing the potential for erosion. Untilled farms, however, improve the carbon content of the soil while reducing carbon dioxide levels from the air. Conservation tillage benefits include:

- **Carbon sequestration in the soil:** as much as one-half ton of carbon dioxide per acre per year is removed from the atmosphere.
- **Topsoil preservation:** 25 billion tons of topsoil are lost each year to runoff. No-till farming decreases soil erosion rates by 90 percent and nutrient and pesticide runoff by 70 percent over conventional tillage.
- **Fuel savings:** 20 to 40 percent less fuel is used to plow fields, reducing emissions.

Conservation tillage has the important benefit of being effective and easily practiced today whereas other technologies to reduce emissions or improve energy efficiency will take some additional years to develop. Monsanto is working with governmental and non-governmental partners in Ghana, Indonesia, India, Brazil, Argentina, and many other countries to promote conservation tillage techniques. Monsanto and WRI are engaging with agricultural groups, government agencies, and other companies to develop a carbon credit trading system in which manufacturers would be able to purchase verifiable carbon credits from farmers who sequester carbon through conservation tillage or other sequestration techniques. Monsanto's products complement and promote conservation tillage farming practices.



[PHOTO] Monsanto's businesses include agriculture, pharmaceuticals, and food products.



Biotechnology also affords opportunities to improve the environment through reduced agricultural inputs and increased value, including: improved nutritional content of crops, reduced pesticide applications, increased yields on existing farmland, and potentially making available fast-growing bio-fuels to replace or supplement current fuel sources. As an example, the NewLeaf™ potato, designed to resist the Colorado potato beetle, significantly reduces insecticide use along with the containers, manufacturing waste, and the fuel required to deliver and apply it.

Eco-efficiency of operations is a third important focus area. A life cycle assessment approach looks at

inputs, outputs (including carbon dioxide) and product use. Efforts include:

- Continuous efficiency improvements in operations
- Participating in the U.S. Green Lights Program at headquarters facilities, and reducing some 12,000 tons of greenhouse gas emissions per year from St. Louis facilities alone
- Conducting energy audits to identify efficiency opportunities
- Writing guidelines for environmentally sustainable design, construction and operation of global facilities.

WORLD RESOURCES INSTITUTE

For 15 years, the World Resources Institute has been working on climate change and promoting economically sound solutions to the world's policymakers. WRI is advancing the policy process through constructive engagement with the business community,

[PHOTO] Monsanto is working with partners in developing countries to promote conservation tillage techniques.

other environmental organizations, and developing countries. In addition, WRI is auditing its own greenhouse gas contributions and creating emissions reduction targets. WRI's new office space is designed as a showcase of energy-efficiency. The president, Jonathan Lash, is co-chair of the President's Council on Sustainable Development (PCSD).

Under its Climate Protection Initiative (CPI), WRI works with companies to identify acceptable policies and business strategies for achieving strong climate protection goals. In addition to SCSB, WRI collaborates with the technology industries to expand markets for new communications and transportation systems that reduce greenhouse gases. In July 1998, *Taking a Byte Out of Carbon: Electronics Innovation for Climate Protection* was published jointly with the Electronic Industries Alliance and the International Cooperative for Environmental Leadership to stimulate further innovation and diffusion of climate-protective technologies. WRI undertakes studies of key climate policy concerns, such as the economic impact and the timing of emission reduction requirements. The next two titles in this series will focus on employment issues and the potential economic and environmental benefits to the agricultural sector.



The central theme of WRI's climate efforts is that climate protection confers multiple benefits and opportunities. Collaborating with the World Health Organization, WRI undertook the first global study of the health impacts of fossil fuel use. The benefits of CO₂ reduction in São Paulo, Brazil, are being quantified. Similar studies are planned in Mexico City and Beijing.

[PHOTO] WRI's reports and efforts stimulate innovation and diffusion of climate-protective technologies.

WRI is committed to working in partnership with developing countries on climate policy. A series of Climate Notes bridges the polarized debate on the role of developing countries by emphasizing the potential for positive action by both the North and South. With sponsorship from the United Nations Foundation, WRI initiated a project in China, in which local scholars are evaluating efficiency and renewable energy options. The project's goal is to cut the environmental and climate impacts of Chinese fossil fuel use while promoting economic growth. In addition, partners in India, China, and Brazil are analyzing how their nations could take advantage of the Kyoto Protocol's Clean Development Mechanism (CDM). This effort complements WRI's collaboration with the Center for Sustainable Development in the Americas and the Foundation for International Environment and Law to help developing countries ensure that the CDM is designed to meet their development goals. Another area of exploration is how the CDM and other provisions of the Kyoto Protocol could be used to support forest and biodiversity conservation.

WRI is developing a new area of work focusing on the global restructuring of energy and fuel sectors worldwide. New efforts include identifying ways to steer investment flows in more climate-friendly ways, particularly in developing countries, and working on solar energy with the Solar Century, based in England.

NEXT STEPS FOR THE SAFE CLIMATE, SOUND BUSINESS INITIATIVE

In the next phase of our collaboration, we will individually and jointly pursue an initial seven-point action agenda. We are committed to implementing the Safe Climate, Sound Business recommendations within our organizations, and we will pursue these next steps in a way that allows other companies to join us in shaping this endeavor. Topics to be explored in the expanded initiative are:

1

CLIMATE PERFORMANCE MEASUREMENT AND REPORTING

Each partner has been working on internal metrics and reporting structures and, based on these experiences, we will exchange what we have learned and develop a joint protocol for measuring and reporting greenhouse gas emissions and the eco-efficiency of our global operations. This effort will incorporate and build on existing efforts and processes as well as feed into other global environmental reporting initiatives.

2

EARLY REDUCTIONS THROUGH EFFICIENCY, OFFSETS, AND TRADING

Based on the current actions and commitments of each company, SCSB member companies will exchange best practices and tools in the areas of energy efficiency, carbon offsets, and emissions trading.

Areas of activity and workshops will include:

- **Internal Corporate Policy on Energy Efficiency:** SCSB partners are committed to reviewing internal policies and sharing successful business tools that create incentives for efficiency investments. Focus areas are: (1) financial analyses using lower hurdle rates/ longer payback periods for energy-efficiency investments, (2) setting energy-efficiency goals for continuous improvement, and (3) investing in advanced technologies, such as integrated PV in new buildings and electric vehicle fleets.
- **Carbon Offsets and Sequestration:** SCSB partners have all been involved with carbon offsets and sequestration projects. We will share these experiences and develop procedures and options for future investments such as possible programs to purchase carbon credits from farmers who implement sequestration techniques, forestry offset projects, and geological sequestration.

- **Trading:** SCSB partners will assess the utility of the BP pilot emissions trading system and other carbon trading models for possible public policy recommendations on emissions trading, joint implementation, and the Clean Development Mechanism. We will also explore the preconditions and requirements for inter- or intra-company trading.

STRATEGIC BUSINESS VENTURES AND ALLIANCES

Creating supportive business networks of firms to generate innovation and speed the transition to a safe climate, sound business future will complement the efforts of SCSB partners. In addition, SCSB partners will explore test-marketing options and incentives to overcome customer and infrastructure barriers in the marketplace.

PURCHASING DECISIONS AND LEVERAGE

The SCSB companies can help create markets for products and services that contribute to a safe climate, sound business future:

- **Suppliers:** SCSB partners will promote supplier environmental and energy performance improvements. We will share supply-chain environmental performance management strategies and link this information to climate metrics and reporting.
- **Purchasing Renewable Energy:** Partners will collaborate on the development of strategies and protocols for soliciting requests for proposals for low-cost renewable power. We will explore group-purchasing opportunities to drive up demand and bring down the unit price of renewable energy purchases.

5

NEW GLOBAL INVESTMENT CRITERIA

SCSB partners have global business activities. In their global businesses, climate change issues and greenhouse gas emissions may not be explicit. Future SCSB efforts will focus on exchanging knowledge that can help make this point explicit:

- **Technology:** Working with and sharing available technologies and processes with business partners and suppliers in developing country markets to support use of the most climate friendly technology.
- **New Operations:** In developing new investments, seizing opportunities to introduce state-of-the-art technologies and processes. SCSB partners will examine barriers and pursue implementation of these technologies and processes. These opportunities will include infrastructure, facility, and product investments. There appears to be great potential for these investment opportunities in rapidly emerging economies.

6

EDUCATION

Each partner will distribute the results of this collaboration and statement of its commitment to its employees, board members, suppliers, and key stakeholders in an effort to raise the awareness of climate change issues, their own contribution, and potential response options.

7

DIALOGUE

SCSB partners want to expand the SCSB initiative to include companies, environmental organizations, and governments in policy dialogues on technology transfer, emissions trading, and other issues. Active participation in the international public policy arena is an important continuing effort of this SCSB initiative.

CONCLUSION

It is clear that the world has a significant challenge before it. The sources of human-caused greenhouse gas emissions go to the very heart of our economies and livelihoods. A shift in the direction of economic development to move purposefully toward sustainable development will help the world address not only climate change concerns but other economic and social issues as well. We should view the climate challenge as one part of this broader movement.

Business has a fundamental role to play in this movement. Not only does business have a large stake in this issue, it also has much to offer in policy and technology development. Public and private policies, if implemented wisely, can spur markets and businesses to employ these resources to achieve the vision and hope of sustainable development. Environmental organizations can also be a catalyst for progress, especially through collaboration with business and government. The current and future actions of the partners in this collaboration are designed to help lead the discussion on how we create policy options and business opportunities that help us reach our common goals for a safe climate, sound business future.



[PHOTOS] Through collaboration, we can reach our common goals for a safe climate, sound business future.

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