Managing the Risks and Opportunities of Climate Change:

A Practical Toolkit for Corporate Leaders

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A Publication of Ceres and the Investor Network on Climate Risk

Ceres

Acknowledgments

This publication was prepared as part of a presentation at the New York Stock Exchange by Mindy Lubber, Ceres President and Director of the Investor Network on Climate Risk, and Ken Sylvester, Assistant Comptroller for Pension Policy, Office of the Comptroller, City of New York. It was written by Miranda Anderson and David Gardiner of David Gardiner & Associates. Peyton Fleming, Chris Fox, Dan Bakal, Andrea Moffat, Meg Wilcox and Jim Coburn of Ceres offered valuable comments.

At the Yale School of Forestry & Environmental Studies 2005 conference, "Climate Change: From Science to Action," the Business Working Group developed draft principles for corporate engagement on climate change. This publication is derived in part from those draft principles. This toolkit is also based on the *Investor Guide to Climate Risk: Action Plan* and *Resource for Plan Sponsors, Fund Managers and Corporations* and *Corporate Governance and Climate Change: Making the Connection*. To download these reports, please visit www.ceres.org.

Ceres is a national coalition of investors, environmental groups and other public interest organizations working with companies to address sustainability challenges such as climate change. Ceres also directs the Investor Network on Climate Risk, a group of over 50 institutional investors managing nearly $3 trillion in assets.

For more information, visit www.ceres.org and www.incr.com.

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Good Corporate Governance Includes Managing Climate Risk & Capturing the Opportunities

During the last five years, climate change has emerged as a top tier concern of governments, companies, and investors. The validity of the science supporting climate change is no longer debated. The atmosphere is warming, and human activity—principally the burning of fossil fuels—is a primary cause.

Climate change is a governance issue, a regulatory issue, and a matter of strategic risk management. The corporate risks and opportunities are vast. Leading Wall Street analysts including Goldman Sachs, Merrill Lynch, Prudential Equity Group, and JPMorgan are studying the effects of climate change on shareholder value. Institutional investors who manage nearly $3 trillion in assets have formed the Investor Network on Climate Risk, proclaiming climate change as a key fiduciary concern and one of the greatest challenges of the 21st century. Corporate boards and executives simply cannot afford to ignore this issue.

Given the sweeping global nature of climate change, climate risk has become embedded, to a greater or lesser extent, in every business and investment portfolio in the United States. Investors have begun pressing corporations for more disclosure of climate risk and opportunities, including the impact of climate change on competitiveness and investment returns. Some companies with significant emissions of greenhouse gases or high energy use face risks from new regulations, while climate change poses direct physical risks to other firms. While each sector and company may differ in its approach to the risks and opportunities of climate change, the most successful corporations engage with concerned stakeholders, disclose their strategies to investors, and take concrete actions to manage risk and capitalize on opportunities.

Who Should Use This Toolkit

This toolkit is designed for any corporate leader with responsibilities related to risk management, governance, climate regulation, or investor relations, including CEOs, COOs, CFOs, EH&S executives and line managers. It should be read by executives to help set policy, and serves as a reference guide for management. Tackling the risks and opportunities posed by climate change must be driven by senior management and managed by dedicated teams.

Business leaders manage off-balance sheet risks and opportunities every day. However, climate changes poses unusual challenges due to the uncertainty of regulatory risk at all levels of government and to the unpredictability of climate change's impact on weather, markets, and trade issues. Climate change also belongs on the balance sheet in the many instances in which direct financial risks can be calculated.

This toolkit provides the basic stepping stones that all leading corporations should follow in order to respond to the actions of competitors, growing investor concern, and existing climate regulations globally and in over 30 states. The kit also helps companies prepare for the inevitability of a carbon-constrained future due to national and international emissions restrictions. Each sector and company will have unique needs beyond the scope of this toolkit; however, the kit outlines the fundamental building blocks to a best practice climate risk management program.

> ***"Nothing will happen on climate change without the CEO and board directly involved."***
>
> Jim Rogers, CEO/Chairman of Cinergy

Climate Risk

Regulatory Risk

State, national, and international regulations are putting increasing pressure on companies with emissions from operations or products to invest in emissions controls, purchase carbon credits, or face clean-up costs. The Kyoto Protocol has come into effect, and the European Union, Canada, China, Japan and others have emission reduction laws. Many U.S. states regulate emissions. Given the growing interest of businesses and Congress in reducing emissions, it is only a matter of time before the U.S. enacts federal carbon constraints.

Physical Risks

Many businesses are at risk from the physical impacts of climate change, including the increased intensity and frequency of weather events, droughts, floods, storms and sea level rise. Changes in consumer habits as the weather changes will also affect profitability in a number of sectors.

Climate Opportunities

Regulatory Opportunities

Companies that are ahead of the curve on emission reductions will face fewer compliance and clean-up costs, and may increase revenue by selling carbon credits. Leading companies can help shape federal regulation as it develops.

Technological Opportunities

Companies in many sectors have the opportunity to increase profitability by developing emission-reducing technologies or new products that meet changing corporate and consumer demands. Companies can also implement energy efficiency strategies to reduce emissions and save money.

Competitive and Reputational Opportunities

Companies with clean technologies may seize new markets or market share. Recent studies demonstrate the financial benefits of being market leaders in this area.

Table 1: Climate Risk & Opportunities in Selected Industries

	Electric Power	Manufac-turing	Auto & Transpor-tation	Oil & Gas	Forestry	Agricul-ture	Fisheries	Health-care	Real Estate	Tourism	Water
Regulatory Risk	◆	◆	◆	◆	◆	◆					
Physical Risk (dependent on location)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Competitive, Reputational Risk	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Regulatory Opportunity	◆	◆	◆	◆	◆						◆
Technological Opportunity	◆	◆	◆	◆	◆	◆					◆
Competitive, Reputational Opportunity	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

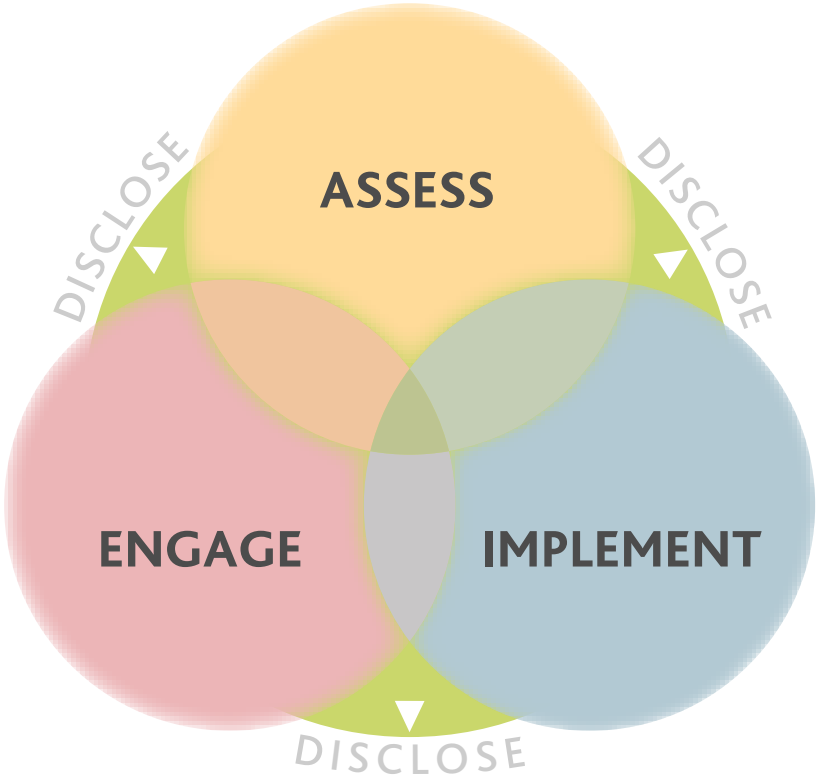
The 3 Phases To Developing a Corporate Climate Strategy

There are three primary phases to developing a comprehensive climate change strategy:

1. **Assess** your company's risks and opportunities.
2. **Implement** policies and action plans to manage risks and capitalize on opportunities.
3. **Disclose** your findings and plans, while **engaging** stakeholders throughout the process.

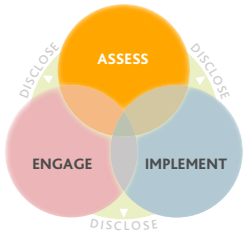
The three phases are not mutually exclusive and may occur simultaneously. You will find more detail on each phase on the next page and throughout this toolkit.

While the kit provides the basic hammer and nails, as your company develops increasingly sophisticated climate strategies, more complicated tools—specific to your sector or company—will have to be developed.



The 10 Key Steps to Corporate Climate Action

ASSESS:	IMPLEMENT:	DISCLOSE & ENGAGE:
Assess risk and opportunities.	**Implement action plan for climate risk and opportunities.**	**Disclose your findings and engage with stakeholders.**
1. Create a climate management team and develop a board oversight committee.	**5.** Develop corporate policies and procedures to reduce climate risk and increase value.	**9.** Publicly disclose assessments and implementation plans in annual financial reports and corporate responsibility reports.
2. Measure, benchmark and inventory greenhouse gas emissions from operations, electricity use, and products.	**6.** Create absolute GHG emission reduction goals and deadlines, and an action plan to achieve results.	**10.** Engage shareholders, analysts, staff and public interest groups to receive valuable feedback and develop proactive responses to climate change.
3. Compute physical, regulatory, and financial risk exposure in fixed assets, products and competitive positioning.	**7.** Set goals to increase energy efficiency, purchase or develop clean energy technologies, and offset GHG emissions.	
4. Assess strategic, branding, and product opportunities related to climate change.	**8.** Engage in policy dialogues about reducing climate risk and enhancing opportunities.	



Phase 1: Assess

Step 1: Create a climate management team to report to the CEO and develop a board oversight committee.

Why Take This Step?

This step establishes a commitment from the board to climate risk and opportunities, oversight by the CEO, and a dedicated team of managers and staff from all branches of the business. Step 1 shows investors, employees, and the public that your company is managing this important issue at all levels of the company.

The Board

Assign a committee of directors with direct oversight responsibility for climate change.

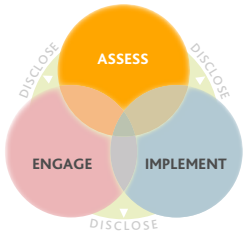
Take a clear position on the issue of climate change and the risks and opportunities it poses.

The CEO

Make attainment of greenhouse gas targets an explicit factor in executive compensation.

The Team

Create a multi-departmental steering committee to coordinate and communicate climate change and clean energy strategy to the board of directors and CEO.



Phase 1: Assess

Step 2: Measure, benchmark and inventory greenhouse gas emissions from operations, electricity use, and products.

Why Take This Step?

Before a problem can be managed, it must be measured. In order for your company to mitigate climate risk, you must have a solid understanding of how much greenhouse gas your company emits (i.e., your greenhouse gas "footprint").

1. Develop annual emissions inventory data for the past 10 years, based on WRI/WBCSD Greenhouse Gas Protocol.

2. Benchmark company performance to your peers on GHG emissions, mitigation strategies, and climate friendly technologies.

Direct Emissions:

Operations

Property holdings

Manufacturing

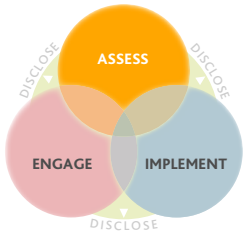
Indirect Emissions:

Consumer use of products

Electricity use

Employee travel

Note: Throughout the process of assessing emissions, companies should also disclose their findings to stakeholders through the Global Reporting Initiative and the Carbon Disclosure Project.



Phase 1: Assess

Step 3: Compute physical, regulatory, and financial risk exposure in fixed assets, products and competitive positioning.

Why Take This Step?

Climate risk is broad and may affect every aspect of your business, from manufacturing to operations to products. Your company must understand how proposed regulations will affect fixed assets as well as future capital investments. Many businesses are at risk from the physical impacts of climate change, including the increased intensity and frequency of weather events, droughts, floods, storms and sea level rise. Companies that neglect their fiduciary duty, employee well-being, or community safety by disregarding climate risk may face reputational risks.

PHYSICAL RISK	REGULATORY RISK	FIXED ASSET RISK	PRODUCT RISK	COMPETITIVE RISK
✓ Changes in weather	✓ Effect of GHG regulations	✓ Physical exposure	✓ Direct and indirect GHG emissions	✓ Aggregate GHG emissions of operations
✓ Water availability	✓ Secondary effects	✓ Age and projected life	✓ Energy demand and fuel use	✓ Ability to respond to changing regulations and new markets
✓ Changes in temperature	✓ Changes in consumer demand	✓ Energy use and fuel mix	✓ Energy efficiency and clean energy design	✓ Introduction of new climate-friendly products
✓ Health effects on workforce	✓ Future cost of carbon, resulting from emission reductions	✓ Fuel switching capabilities	✓ Low GHG alternatives	✓ Corporate reputation, brand value, credit risk, and legal risk
✓ Cost of adaptation		✓ Vulnerability to interruptions in power/water	✓ Low GHG R&D	
		✓ Proximity to coastlines	✓ Supply chain issues	

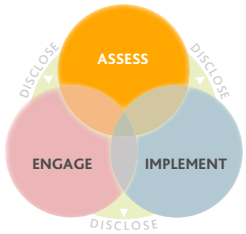
Case Study: American Electric Power Assesses Regulatory Risk

A committee of independent directors of the Board of American Electric Power (AEP) recently completed a report to shareholders assessing the company's actions to mitigate the economic impact of emissions policies, especially for climate change (see www.aep.com/environmental/).

The report analyzes three potential policy scenarios – the Environmental Protection Agency's current proposal to regulate nitrogen oxides (NOx), sulfur dioxide (SO_2) and mercury (Hg), but not carbon dioxide (CO_2); the proposed McCain-Lieberman Climate Stewardship Act; and Senator Carper's proposed Clear Planning Act. AEP projects the costs of each scenario.

By carefully assessing risk, AEP was able to develop a strategic approach to addressing air pollution and climate change. Between now and 2010, for example, AEP expects to invest $3.5 billion in pollution control equipment to meet new EPA requirements for SO_2, NOx, and Hg. However, when the company assumes a constraint on CO_2 after 2010, it faces difficult choices about changes in the composition of its generation fleet, especially as these assets age.

AEP's report is detailed and comprehensive and establishes a new benchmark in corporate disclosure on the climate change issue.



Phase 1: Assess

Step 4: Assess strategic, branding, and product opportunities as a result of climate change.

Why Take This Step?

Your company should examine whether it is well positioned to capitalize on the opportunities related to climate change. If you discovered in Step 2 that your company has particularly low emissions, your firm may profit from the growing multi-billion dollar carbon trading market. Or your company may develop low-carbon technologies that will be in high demand as new GHG regulations come into force.

Maximize strategic investments in climate-friendly technologies, products and manufacturing processes
Establish a business unit to collect GHG emissions data and engage in emissions trading to boost internal rates of return
Utilize leadership status on climate change to increase brand value
Factor costs of GHG emissions into major investment and operating decisions, and consider the physical effects of climate change in major facility siting decisions

Case Study: General Electric Assesses Strategic and Branding Opportunities

GE was quick to recognize the business opportunities posed by climate change and to seize the moment by launching "ecomagination," a company-wide initiative to aggressively bring to market new technologies to address environmental challenges, such as the need for cleaner sources of energy.

Through ecomagination, GE is establishing partnerships with its customers to reduce their carbon emissions, while doubling its research spending to develop new products and services to fulfill its customers' needs. Specifically, GE has pledged to raise investment in R&D for cleaner technologies to $1.5 billion annually and double its revenues from the sale of ecomagination products to $20 billion by 2010.

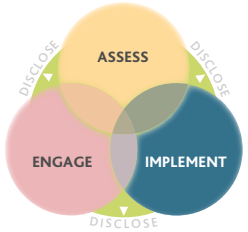
Already a leader in energy-efficient power generation technologies, renewable energy, and energy-efficient consumer appliance and lighting products, GE has received substantial positive publicity by branding these products with the ecomagination name. Less than a year after being launched, ecomagination has become an established part of the lexicon among energy and business professionals worldwide.

Seventeen GE products initially met the ecomagination criteria of significantly and measurably improving customers' environmental and operating performance, and GE plans to add more each year. The products include solar panels, wind turbines, fuel cells, hybrid locomotives, lower-emission aircraft engines, washing machines, lighter and stronger materials, and efficient lighting.

Several years in the making, the 2005 initiative grew out of a dialogue between GE and its customers in the energy and heavy industry sectors who were looking for cleaner and more efficient ways to operate.

"Increasingly for business, Green is Green."

Jeff Immelt, CEO of General Electric



Phase 2: Implement

Step 5: Develop corporate policies and procedures to reduce climate risk and increase value.

Why Take This Step?

After assessing your company's risk and opportunities, the board, CEO, and climate change team should develop clear policies and procedures to reach your goals. These action plans are signals to stakeholders and employees that you are looking toward the future by developing solutions that will protect and maximize your company's value.

Governance

✓ Describe corporate governance actions regarding climate change, including the Board's involvement and which executives oversee management of climate risk.

Policies

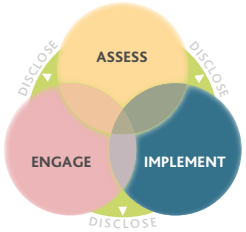
✓ Issue a clear, proactive policy about the company's climate change position and response plan.

✓ Disclose the company's greenhouse gas control strategy.

Operations

✓ Integrate climate policy into strategic business planning.

✓ Develop staffing structure for management of climate change operations throughout business units.

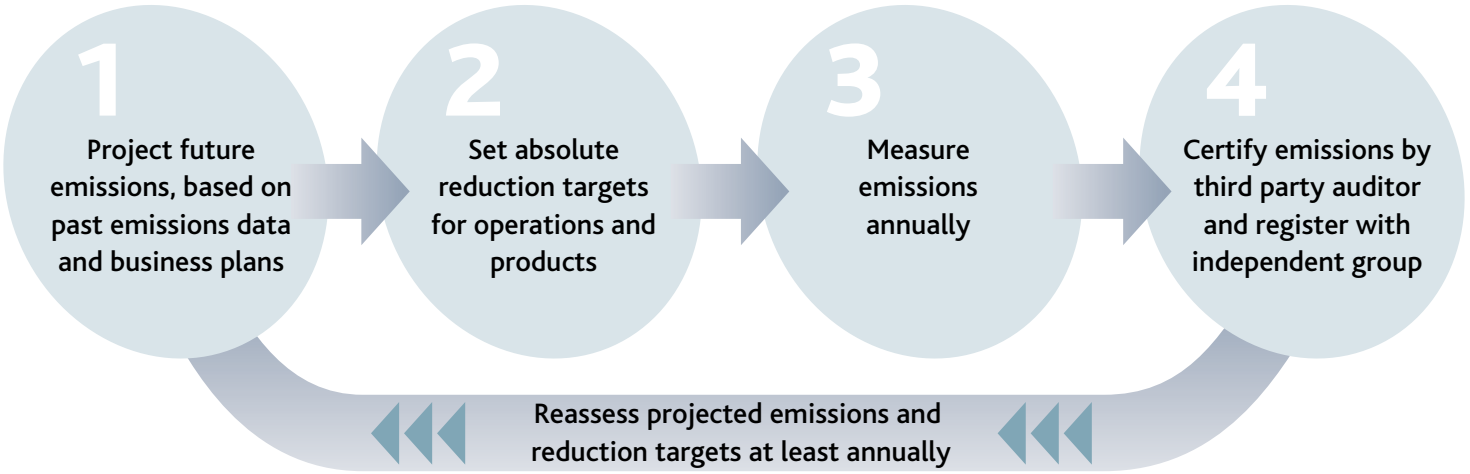


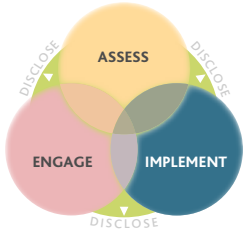
PHASE 2: IMPLEMENT

Step 6: Create absolute GHG emission reduction goals and deadlines, and an action plan to achieve results.

Why Take This Step?

A key component of a climate change strategy is setting goals to reduce GHG emissions, including total emissions and emission rates (e.g. tons of CO_2 per unit of production). The plan should have quantitative and temporal goals, and it should be certified annually by an external auditor.





Phase 2: Implement

Step 7: Set goals to increase energy efficiency, purchase or develop clean energy technologies, and offset GHG emissions.

Why Take This Step?

In addition to reducing greenhouse gas emissions in step 6, which minimizes risks, step 7 helps reduce costs, maximize revenue, expand innovation, and develop new markets.

Set targets to improve energy efficiency and reduce carbon intensity in operations and products
Purchase or develop clean energy and climate friendly products and services
Participate in an external voluntary greenhouse gas emissions trading program

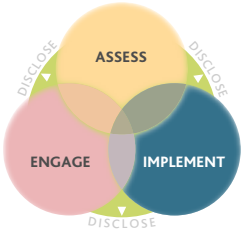
Case Study: Bank of America Implements Climate Change Policies

Bank of America is among a growing number of financial services companies that have set a corporate climate change policy and are integrating that policy into the company's operations (see www.bankofamerica.com/environment/). In 2004, it committed to specific goals for reducing greenhouse gas emissions resulting both directly and indirectly from its financing activities. Its initial goal is to reduce GHG emissions from its operations by 9 percent by 2009, and to realize a 7 percent reduction by 2008 of indirect GHG emissions from its energy and utilities portfolio.

Recognizing that forests play a key role in recycling carbon globally, Bank of America also introduced a new forests practices policy with due diligence measures to assure that lending proceeds are not used in resource extraction from old-growth tropical rainforests or logging in other sensitive forests. A similar policy is in place for sourcing paper for internal operations.

To ensure that environmental goals and objectives are achieved and reported, Bank of America created an environmental council comprised of senior and executive leadership, with the chair of the council reporting directly to the CEO. It also committed to meeting regularly with stakeholders to implement its policy and report on its progress. The bank began using the Global Reporting Initiative framework for sustainability reporting beginning with its 2004 report.

In the public policy arena, Bank of America is committed to using its position as a community and industry leader to elevate the public and private sector's commitment to addressing climate change. It recently issued a public statement in support of the Northeast states' innovative Regional Greenhouse Gas Initiative, a cap-and-trade system aimed at reducing greenhouse gas emissions from the region's power plants.



Phase 2: Implement

Step 8: Engage in policy dialogues about reducing climate risk and enhancing opportunities.

Why Take This Step?

Engagement in the public policy discussion shows stakeholders that your company is serious about climate change, and also positions your company to have increased influence on policy. Without clear federal mandates, U.S. companies are falling behind overseas competitors who are benefiting from tax incentives and subsidies for developing climate-friendly solutions.

Engage in policy dialogue at national, regional and state levels
Provide forward-looking, time-referenced disclosure of climate risk and opportunities in securities filings
Seek government support for energy efficiency and clean technology research and development to diversify the energy supply

"...shareholders are increasingly asking about the risk as well as the opportunities associated [with climate change]."

Bill Ford, CEO/Chairman of Ford Motor Company

Case Study: Ford Calls for Government Action to Reduce Risks of Climate Change

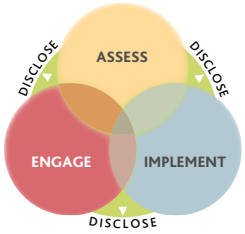
The Ford Motor Co. has taken a strong public position that actions are needed today to address climate change and that developing vehicles with dramatically lower GHG emissions will be a key factor in the company's long-term competitiveness. (See www.ford.com/go/sustainability for the *Ford Report on the Business Impact of Climate Change*, released December 20, 2005.)

Ford has set aggressive targets to reduce greenhouse gas emissions at its facilities and was the first automaker to participate in GHG emissions trading programs in the U.S. The company also developed the world's first hybrid-electric SUV, the Ford Escape, and recently committed to build up to 250,000 hybrids a year by 2010, a 10-fold jump from current production levels.

CEO Bill Ford has advocated for closer cooperation between government and industry in confronting the country's pressing energy and manufacturing challenges. In a November 2005 speech to the Business Roundtable, Ford called for such cooperative measures as:

- Congressional action to dramatically increase the R&D tax credit to support companies working on advanced vehicles, components and fuel technologies;
- Congressional deliberation of tax incentives to help American manufacturers convert existing, outmoded plants into high-tech facilities;
- Increased government purchasing of hybrid or other alternatively-fueled vehicles by 2010;
- Expanding the infrastructure for ethanol fuels;

Ford stressed that government action on climate change could help America stay competitive in the face of globalization pressures, and that failure to invest in American innovation would concede the country's competitive edge in vital parts of the economy.



Phase 3: Disclose & Engage

Step 9: Publicly disclose assessments and implementation plans in annual financial reports and corporate responsibility reports.

Why Take This Step?

Disclosure is a critical component of successful climate change governance. Transparent discussion of your company's strengths and weaknesses allows investors, employees, and stakeholders to engage in a meaningful way and help develop realistic solutions to ensure the maximization of shareholder value. Climate risk and opportunities that pose material risks to investors should be disclosed in securities filings.

Identify material risks posed by climate change and GHG emissions controls in securities filings.
Issue a sustainability report in accordance with the Global Reporting Initiative (GRI) guidelines.

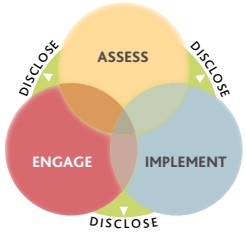
Case Study: Chevron Discloses Carbon Reduction Strategy

Chevron is the first U.S. oil company to disclose its entire greenhouse gas footprint – including emissions both from its operations and the use of its end products – and to set an absolute reduction target. Chevron's efforts to manage and reduce its greenhouse gas (GHG) emissions began in 2000 with the development of a software system to account for and report all known sources of GHGs and estimate energy use. After its merger with Texaco in 2002, Chevron developed a greenhouse gas emissions inventory protocol that defines emissions accounting principles, provides guidelines and establishes a scope for what to report.

Assessing its total emissions at 63.9 million metric tons equivalent CO_2 for 2003, Chevron set a reduction goal of a minimum of 900,000 metric tons for 2004. The company surpassed this goal, achieving a reduction of 1.4 million metric tons through divestiture of some production facilities and increased efficiency—even as refinery throughput slightly expanded. Chevron also commissioned KPMG and the URS Corp. to conduct a third-party verification of its greenhouse gas emissions inventory for the years 2002 and 2003.

Beyond setting goals to achieve an absolute reduction in GHG emissions, the company has taken actions to disclose its potential financial exposure from climate change, and to develop strategies to improve its strategic positioning, including:

- factoring carbon costs into capital allocation decision-making and new investments
- developing a long-term greenhouse gas emissions profile based on assumptions of future growth
- investing over $100 million annually in wind, solar, geothermal and other renewable energies and publicly reporting on these investments

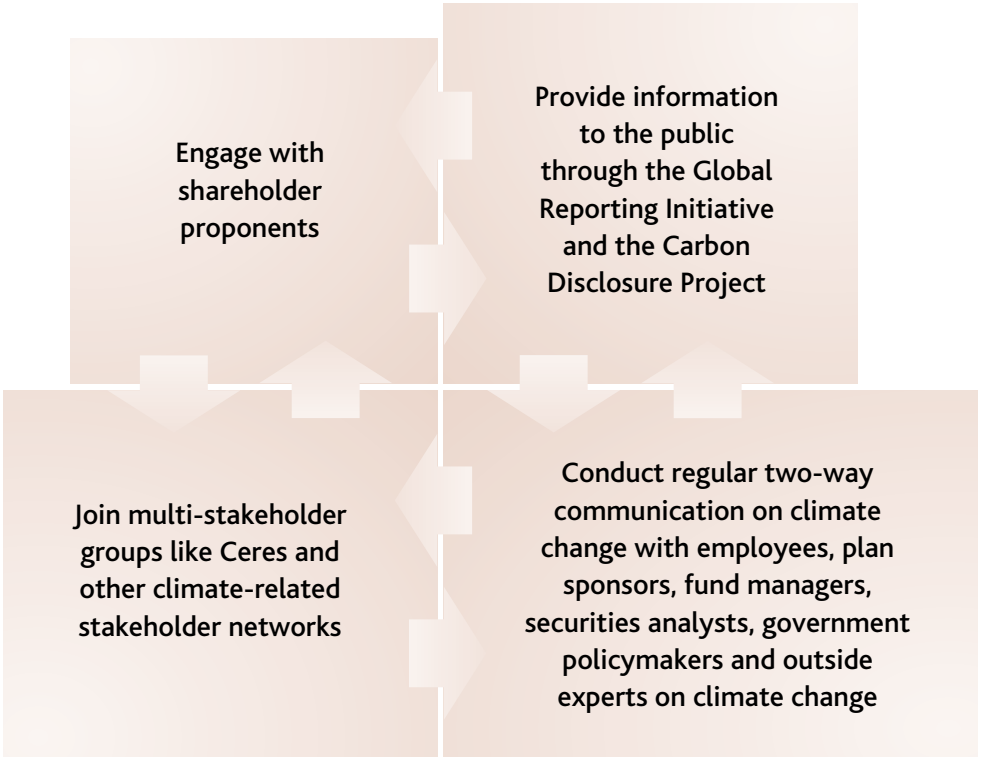


Phase 3: Disclose & Engage

Step 10: Engage shareholders, analysts, staff and public interest groups to receive valuable feedback and develop proactive responses to climate change.

Why Take This Step?

Open dialogue allows your company to benefit from the latest climate change science, innovative solutions by industry peers, new approaches from executives of other sectors, and robust stakeholder management.



More Information

This kit provides the basic tools for building your climate change program. However, more detailed solutions have been developed by leading corporations, concerned investors, and climate change experts.

ASSESS

Investor Network on Climate Risk
www.incr.com

Promoting a better understanding of the risks and opportunities of climate change among institutional investors.

IMPLEMENT

WRI/WBCSD Greenhouse Gas Protocol
www.ghgprotocol.org

Harmonizing GHG accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting.

Emissions registration initiatives:

World Economic Forum Global GHG Register
www.weforum.org/ghg

Climate Leaders
www.epa.gov/climateleaders/

California Climate Action Registry
www.climateregistry.org

DISCLOSE & ENGAGE

Ceres
www.ceres.org

A national network of investment funds, environmental organizations and other public interest groups working to advance environmental stewardship on the part of businesses.

Disclosure initiatives:

Global Reporting Initiative
www.globalreporting.org

Carbon Disclosure Project
www.cdproject.net

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