TABLE OF CONTENTS

Foreword 06
Acknowledgements 08
Executive Summary 10

THE CHALLENGE OF CLIMATE CHANGE 11
Global Climate Change Reports 15
Climate Change Risks 17
Climate Change Opportunities 19

CANADIAN CLIMATE CHANGE DEVELOPMENTS 21
The CBSR Climate Change Interview Series 26

THE BUSINESS OF CLIMATE CHANGE 27
Determining Impacts and Implications 32
Quantifying GHG Emissions 33
Assessing Risks and Climate Adaptation Approaches 36

Developing a Climate Change Action Plan 38
Formulating Climate Commitment 39
Statements and Strategy 40
Establishing Goals and Targets 40
Evaluating Carbon Management Alternatives 41

Securing Buy-in and Communicating Progress 45
Engaging Stakeholders 46
Climate Reporting and Communications 50

OFFSETTING AND CARBON NEUTRALITY 55
Concluding Comments 61

TOOLS AND RESOURCES 63
Carbon Calculators 70
Abbreviations and Acronyms 70
Glossary of Terms 71
References 77

TABLE OF FIGURES

Fig 01 Highlights of the Stern review / the economics of climate change 15
Fig 02 Highlights from the Intergovernmental Panel on Climate Change 16
Fig 03 Opportunities through shareholder engagements 19
Fig 04 Snapshot of WWF Scorecard – Canada 23
Fig 05 Drivers of climate related strategies 30
Fig 06 The Climate ChangeGovernance checklist 31
Fig 07 Top ten tips – Developing your carbon footprint 34
Fig 08 GHG impact operational boundaries 35
Fig 09 Steps in the risk management process 36
Fig 10 Top ten considerations – Carbon risks and benefits disclosure 37
Fig 11 GHG reductions – low-hanging fruit 42
Fig 12 Metrics of success for climate strategies 44
Fig 13 Tips – Motivate employees on climate change 47
Fig 14 Engaging your supply chain 49
Fig 15 GHG reporting frameworks 51
Fig 16 Best practices for communicating climate change 53
Fig 17 Communications and reporting of climate change strategies 54
Fig 18 The benefits of voluntary offsetting 57
Fig 19 Reference documents for voluntary carbon offset projects 59
Fig 20 So you want to be a carbon neutral leader? 60
SHIFTING THE WORLD ONTO A LOW-CARBON PATH COULD EVENTUALLY BENEFIT THE ECONOMY BY $2.5 TRILLION A YEAR\(^1\)

EQUIVALENT TO TWICE THE SIZE OF CANADA’S 2006 GROSS DOMESTIC PRODUCT (GDP)\(^2\)

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THIS GUIDE PROVIDES CORPORATE CANADA WITH BALANCED AND PRACTICAL INFORMATION ALLOWING THE PRACTITIONER TO DEMONSTRATE HOW CLIMATE CHANGE IS A CORE BUSINESS ISSUE.
I congratulate Canadian Business for Social Responsibility (CBSR) on taking the initiative to organize this timely and important study. In the nine months since the project was commissioned, we have seen dramatic shifts in public interest and commitment to carbon emissions regulation around the world, as well as the release of the IPCC reports which definitively link climate change to human economic activity.

Our company is in the business of researching solutions to air pollution issues, so we had a head start in thinking about the implications of carbon regulations. Because energy use and carbon emissions are associated with every single business activity, there is no business or individual who isn’t affected by such laws. Carbon is not just another toxic pollutant to be managed by an environmental operations group within our companies, using their traditional processes and measurement tools; and climate change isn’t simply about warmer Canadian winters. Quite the contrary – the implications are strategic and could force massive industry-wide changes in global business operations. If it’s not already there, the issue belongs at the CEO and Board level of every company.

Some companies will be more impacted than others, of course. In carbon intensive industries, like natural resources, companies may see growth plans dramatically affected or will need significant process and technology development. Other industries – agriculture, transportation, insurance – may need to be more focused on the strategic risks of climate change within their operating geographies.

If our society really wants meaningful reduction in greenhouse gases, we’re convinced that there are sound, realistic approaches. In this context, we believe that many Canadian companies can and will prosper in this period of global focus on the environment. Organizations that are first to exploit the many new opportunities and first to implement effective mitigation measures will inevitably be more effective than their slower competitors. We believe climate change offers more opportunity than risk to Canada. And in this period before new regulations are actually enacted, Canadian business has a great opportunity to influence societal behaviour through their customers, suppliers, employees and other stakeholders.

When Adine mentioned the opportunity to work together to develop an overview of current Canadian corporate thinking on climate change, we were very pleased to be able to participate. I think the results speak for themselves. This Guide is a unique and important contribution to this important issue and we hope you find it thought provoking and helpful.

David Demers
Chief Executive Officer
Westport Innovations Inc.
As our member companies were getting themselves oriented on the climate change crisis, many approached us for guidance and assistance. While it is true that there is a great deal of information on climate change in circulation already, much of it is difficult to navigate and some provides conflicting perspectives. We were also missing a Canadian perspective with uniquely Canadian resources and case studies.

As CBSR’s early work focused on meeting the needs of individual companies, we were keen to leverage this in a way that would benefit many. This became the impetus for CBSR to publish a complimentary Canadian climate guide and distribute it widely.

CBSR’s ‘The Climate Change Guide’ has several goals:
1. To simplify the complex climate change landscape for a Canadian business audience.
2. To assist business managers to understand where the strategic opportunities exist.
3. To layout a basic framework for inspired business action.

As the largest CSR network in Canada, our primary goal is to inspire and advance responsible business action. If we are to achieve success it will be because we have been able to effectively mobilize our member companies, building on their experiences to reach a greater scale and deliver greater impact.

Inside these pages you will find website resources, tools, calculators, case studies and more. All of them designed to support you – whether these are your company’s first steps or a much needed acceleration to the next level of performance.

While we have looked around the globe to bring you the very best information that is currently available, we have made it a priority to select Canadian case studies to illustrate various leadership practices, whether these are focused on emissions reduction, stakeholder engagement, or highly effective climate related communications. Consider this Guide as your Climate Change 101 text.

With projects of this size and scope, CBSR benefits from the assistance and input from our member companies. As such Westport Innovations’ generous support was critical to the success of this initiative. Karen Hamberg, the author, was seconded for a period of nine months to CBSR from Westport Innovations. Karen’s role as an educator and a CSR practitioner made her a perfect fit for this project.

We hope that you will find The Climate Change Guide as inspiring and practical as we intended it to be and, that you will find within these pages the resources you need to develop your own unique blueprint for action.

Adine Mees
President and Chief Executive Officer
Canadian Business for Social Responsibility
ACKNOWLEDGEMENTS

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To find out more about this Guide, or for customized advice on climate, please contact CBSR on: www.cbsr.ca; alternatively contact our offices below.

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Westport Innovations Inc. is a leading developer of environmental technologies that enable vehicles to operate on clean-burning alternative fuels.

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Leading responsible development in Canada's oil sands.

DOMTAR EarthChoice
High quality paper with a conscience
Leading companies are leveraging the issue of climate change to meet other objectives such as increased energy efficiency, overall environmental stewardship, risk management and policy leadership. Achieving new and environmentally sound practices requires a broad and deep change in a company’s culture and systems. The most durable corporate climate change programs will have linked goals that can be aligned with corporate culture to create ongoing forward movement.

CBSR has fielded a growing number of climate queries from our cross-sectoral member base. Many of our members in extractive and climate-regulated industries are demonstrating not only Canadian but international leadership in their efforts to minimize the carbon footprint associated with operations, and they advocate regulatory policy and fully disclose the risks and business opportunities posed by climate change. Other member companies with softer carbon footprints are also developing comprehensive climate change strategies and making significant progress to reduce their carbon impacts despite no current regulatory requirement to do so.

This CSR practitioner’s guide to addressing climate change is laid out in five sections.

Section One: The Challenge of Climate Change, outlines the scope of the issue and the scale of change required to prevent serious environmental, economic and social consequences. A comprehensive listing of the financial, regulatory, physical, litigation, reputational and competitive risks as well as the range of potential business opportunities is also provided.

Section Two: Canadian Climate Change Developments, highlights the current state of regulatory developments and the broader issue of climate change in a Canadian context.

Section Three: The Business of Climate Change, details the required steps to develop a comprehensive climate change program and is divided into three subsections. These are supplemented with examples of leading practices from the 13 companies interviewed as part of this research. The three subsections include:

> Determining Impacts and Implications, includes quantifying Greenhouse Gas (GHG) emissions, assessing risks and climate adaptation approaches.

> Developing a Climate Change Action Plan, addresses formulating a climate commitment and strategy, establishing goals and targets and evaluating carbon management alternatives.

> Securing Buy-in and Communicating Progress, discusses how to engage with stakeholders and communicate / report climate strategy.

Section Four: Offsetting and Carbon Neutrality, responds to the recent growth of the voluntary carbon offset market and claims of carbon neutrality by providing an overview of these trends.

Section Five: Tools and Resources, provides a comprehensive “help list” including carbon calculators, abbreviations, acronyms and, a glossary of terms.

We have structured this guide to provide helpful resources to Canadian sustainability practitioners seeking assistance and guidance on a range of climate-related topics. While it could be read as a report from cover to cover, it is more likely that readers will dip in and out, accessing those sections most relevant to them. It is also expected that the tools, strategies and tactics outlined within will be of more value to those industries with softer carbon footprints and for whom proposed GHG reduction regulations are not applicable.

Acknowledging that corporate action on climate change has been delayed in part to the perceived complexity of the issue, this guide provides clarity through a comprehensive management framework that allows the practitioner to position climate change as a core business issue.


“What actions will each of you feel able to take? Everyone can do something because business is not only a major contributor to climate change but can also play a key role in tackling the problems and reducing their impact. The three key areas must be: first, tackling emissions for which they are responsible; secondly, encouraging their suppliers and business customers to take action of their own; and thirdly, designing products and services which will help their customers to reduce the emissions associated with their use.” Patron: HRH The Prince of Wales
Industrialized countries need to decrease their emissions by 80% by the year 2050, accounting for growth in developing countries. Climate scientists, environmentalists and business leaders view climate change as urgent, difficult but not impossible to address, and requiring immediate and substantial societal action.

Despite challenges, climate change is a potentially solvable problem. GHG emissions and atmospheric concentrations are measurable thereby allowing society and business to track results and progress.

Climate change risk is a business reality for which all organizations must plan. Failing to assess and manage climate risks will have significant implications for businesses and their stakeholders.

There are six categories of climate risk for business including financial, regulatory, physical, litigation, reputational and competitive risk.

Climate change has created business opportunities including new regulatory frameworks, carbon emissions trading schemes, shifting consumer demands and a market for carbon neutral products and services.


<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Climate Change Reports</td>
<td>15</td>
</tr>
<tr>
<td>Climate Change Risks</td>
<td>17</td>
</tr>
<tr>
<td>Climate Change Opportunities</td>
<td>19</td>
</tr>
</tbody>
</table>
Climate change is a global challenge with serious impacts and consequences for the natural environment and our social and economic infrastructure. The risks introduced by climate change are reshaping the business environment with forward-looking companies, working to develop innovative responses to the challenge to protect both profitability and the planet. With clear scientific consensus that climate change is occurring and that human activities are a major contributing factor, the focus has shifted to how to achieve the large-scale reductions in GreenHouse Gas (GHG) emissions needed in a relatively short time to avoid the more extreme impacts associated with higher Carbon Dioxide (CO₂) concentrations in the atmosphere.

There is widespread technical agreement that the global average temperature increase in comparison to pre-industrial levels should be kept below 2°C. As a consequence, global GHG emissions will need to peak in the next 10 to 15 years and then decline to a fraction of current levels. Leaving some room for growth for developing countries, industrialized countries need to decrease their emissions by the order of 80% by the year 2050. This is a major challenge as, current trends are going in the opposite direction with high emissions in developed countries and growing emissions in most developing countries.⁹

Economists have identified climate change as classic “market failure.” The single largest cause of that failure is that in most of the world there is no price placed on emitting CO₂ and other GHGs into the atmosphere. There are several ways in which climate change is different from more customary externalities: its causes and consequences are global and will have substantially different impacts across countries; its effects will persist long after the original emissions were released and the uncertainties and risks introduced by climate change are broad in scope.⁹

Climate scientists, environmentalists and business leaders view climate change as urgent – difficult but not impossible to address – and requiring immediate and substantial societal action. Moser and Dilling (2007) identified a range of characteristics specific to climate change that make it difficult to understand, communicate and contribute to the current state of paralysis.¹⁰ These characteristics include:

A lack of immediacy
CO₂ and other GHGs are invisible and at atmospheric concentrations have no direct negative health impacts on humans.

The remoteness of impacts
There is a widely-held perception supported by science and political rhetoric that society will be able to adapt to any adverse climate impacts in the mid-to-long-term.

The Issue of time lag
It is urgent to act now due to the extended delays before the impact is fully realized. Global emissions are rising, but simply halting the risk or potential impacts by stabilizing emissions will not be sufficient to stabilize concentrations.¹¹ Energy and transportation systems and infrastructure will develop over decades, but change would not be immediate even if we started now.

Skepticism about solutions
Given the scale and magnitude of the problem, consumers wonder how small personal actions such as changing light bulbs, may contribute to solving a global problem.

“One thing that we’ve really broadly started to appreciate more is that climate is not an environmental issue. Climate change is a systemic and fundamental issue about the way our economics work and the way we get our energy.”²

Sonia Labatt and Rodney R. White
**Threats to values and self-interests**

Proposed solutions and policy mechanisms are viewed by some as conflicting with closely held values, priorities and interests such as national sovereignty, economic growth and job security.

**Tragedy of the commons**

Climate change represents the ultimate commons problem as all nations share one atmosphere.

**Political economy and injustice**

Some regions are disproportionately affected by climate change and societal vulnerability.

Despite the above-mentioned factors, climate change is a potentially solvable problem. GHG emissions and atmospheric concentrations are measurable, thereby allowing society and business to track results and progress. For a complete listing of means by which businesses can track their emissions and reduction progress, refer to: Section Five: Tools and Resources, page 63. The acid rain problem in the late 1980s and early 1990s set a clear precedent for how to tackle a large, seemingly intractable, global environmental issue. The cap and trade mechanisms implemented at the time led to dramatic and cost effective reductions in Sulphur Dioxide (SO$_2$) emissions that reduced the threat in a very short time. Advocates of market-based mechanisms cite this precedent as evidence that such systems are effective in reducing emissions, are cost effective and do not hamper economic growth.  

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The Stern Review on the Economics of Climate Change, a report analyzing the effects of climate change on the global economy, was released in October 2006 by economist Sir Nicholas Stern for the British government. While it is not the first economic report on climate change, it is significant as the largest, most comprehensive and widely known report of its kind. One of Stern’s key conclusions is that the cost of inaction is likely to be dramatically greater than costs associated with timely, effective action. The report has been credited with triggering a shift in policy from voluntary initiatives based largely on efficiency improvements, towards a mandatory and compliance-focused approach that provides businesses with the regulatory certainty they need for planning purposes.


### Economic and Environmental Impacts:

- Unabated climate change could cost the world at least 5% of GDP each year; if more dramatic predictions come to pass, the cost could be more than 20% of GDP.
- The cost of reducing emissions could be limited to around 1% of global GDP.
- Shifting the world onto a low-carbon path could eventually benefit the economy by $2.5 trillion a year.
- By 2050, markets for low-carbon technologies could be worth at least $500 billion.
- Average temperatures could rise by 5°C from pre-industrial levels if climate change goes unchecked.
- Rising sea levels could leave 200 million people permanently displaced.
- Before the industrial revolution, levels of GHGs in the atmosphere were 280 parts per million (ppm) CO₂ equivalent (CO₂-e). The current level is 430ppm CO₂-e. The level should be limited to 450-550ppm CO₂-e.

### Recommended Actions and Options for Change:

- Carbon pricing, through taxation, emissions trading or regulation will demonstrate the range of economic, environmental and social costs. A global carbon price across countries and sectors should be established.
- Emissions trading schemes, like that which operates across the EU, should be expanded and linked.
- Set new targets for the European Emissions Trading Scheme (EETS) to reduce carbon emissions by 30% by 2020 and 60% by 2050.
- Technology policy should drive the large scale development and use of a range of low-carbon and high-efficiency products.
- Support for energy research and development should at least double with the support for the deployment of low-carbon technologies increased by up to five times.
- Promote cleaner energy and transport technology, with non-fossil fuels accounting for 60% of energy output by 2050.
- Work with the World Bank and other financial institutions to create a $20 billion fund to help developing countries adjust to climate change challenges.

“Climate change is a synthesis of all other environmental issues; energy (in)efficiency, deforestation, pollution, species extinction, water use and desertification, urban sprawl ... many of the most pressing environmental issues are related intimately to the problem of climate change.”

Andrew Heintzman

Co-recipients of the 2007 Nobel Peace Prize, the Intergovernmental Panel on Climate Change (IPCC), reported in February 2007 that it is “very likely” (greater than 90%) that heat trapping emissions from human activities have caused most of the observed increase in globally averaged temperatures since the mid-twentieth century. Evidence that human activities are the major cause of recent climate change is even stronger than in prior assessments.

The findings of the IPCC are the result of six years of progressive research by Working Groups I, II and III. The Group is composed of the world's pre-eminent climate scientists. The results of Working Group I were supplemented by the subsequent contributions of Working Group II ‘Impacts, Adaptation and Vulnerability’; and Working Group III ‘Mitigation of Climate Change’; and Working Group I ‘Fourth Assessment Report of the Intergovernmental Panel on Climate Change.’

The debate is no longer centred on whether human induced climate change is happening but how the challenge should best be tackled and who will bear the costs.


Global increases in CO₂ concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.

Atmospheric concentration of CO₂ in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice core samples.

Eleven of the last twelve years (1995-2006) rank among the twelve warmest years in the instrumental record of global surface temperature (since 1850).

Average Arctic temperatures have increased at almost twice the global average rate in the past 100 years.

In the course of this century, water supplies stored in glaciers and snow cover are projected to decline, reducing water availability in regions supplied by meltwater from major mountain ranges, where more than one-sixth of the world population currently lives.

It is projected that by 2080 many millions more people will be flooded every year due to a rise in sea-level. Most affected will be the mega-deltas of Asia and Africa while small islands are especially vulnerable.

By 2020, between 75 and 250 million people are projected to be exposed to an increase of water stress (shortage of potable water) due to climate change.
Climate change risk is a business reality for which all organizations must plan. Failing to assess and manage climate risks will have significant implications for businesses and their stakeholders. The right blend of climate risk strategies can substantially reduce the costs of mitigation and generate economic benefits. The most powerful and often-cited example of this is the reduced energy expenditure that most companies realize under a program to reduce emissions.

Recent studies have noted far greater disclosure and discussion of the business opportunities of climate change as compared to the risks. The low rate of reporting on risks may be because companies see climate change not only as a threat but also an opportunity for new products, services and trade initiatives. Risks could be perceived to be beyond current business planning horizons or companies may not have identified, explored or quantified risks associated with climate change and may therefore not be in a position to report on risks. There is still limited agreement on a standardized methodology for assessing climate risks as this is required for companies to make credible statements about risks and enable investors to analyze or make meaningful comparisons.

A comprehensive risk management analysis will facilitate an understanding of the potential means by which a climate risk could directly and indirectly affect operations, resources, reputation, financial position and competitive advantage. There are six categories of climate risk including regulatory, financial, physical, litigation, reputational and competitive risk.

**REGULATORY RISK**

Regulatory exposure from national and/or international GHG emission reduction policies will cause the greatest financial impact for most firms. Regulatory risk is viewed in terms of a company’s record of compliance with respect to any carbon policies that are material to its financial performance. While an optimal global policy would impose a consistent charge on emissions across all sectors, regulations are likely in practice to be sector or industry specific with emphasis on the automobile industry, utilities, integrated oil and gas, building, construction and, cement manufacturing.

**FINANCIAL RISK**

Climate change is likely to drive increases in the cost of energy, raw materials, insurance premiums and capital expenditures. Additional and prohibitive operational costs are expected as businesses adapt sites and processes to mitigate the impacts of climate change. Revenues will be impacted by the inability to pass these costs onto consumers while exploiting new market opportunities and maintaining market share. Significant emissions in any industries’ supply chain may still result in increased costs (upstream) or reduced sales (downstream). As payment for GHG emissions may be direct through a carbon tax or emissions trading scheme, or indirect through increased energy prices, a company’s financial liability can be reduced by reducing absolute emissions and energy use.

**PHYSICAL RISK**

Physical risks are those that arise from the changing climate itself such as damage to property and infrastructure from extreme
“Climate change will impose change on business slowly, but inexorably. Just because an influence is slow-moving however does not mean that its effects will always be commensurately slow. Slow-moving forces can on occasion impact business quite sharply and suddenly.”

John Llewellyn

weather events. Industries that are particularly exposed include agriculture, fisheries, forestry, tourism, water, real estate and insurance. A company should ask itself what the impacts of such unforeseen risks as altered weather patterns, severe storms, sea level rise, water availability and potential health risks due to the spread of disease could have on it as a result of climate change. Once these questions are addressed, companies are encouraged to analyze and disclose the material, physical effects that climate change may have on the company’s business and operations.

LITIGATION RISK
Legal risks arise when litigation is brought against companies that contribute to climate change. Companies that generate significant GHGs are at risk of shareholder lawsuits. As class actions law suits are becoming more common, it is foreseeable that companies may be threatened by such action in areas where citizens and communities are feeling the effects of climate change.

Mass torts
As class actions law suits are becoming more common, it is foreseeable that companies may be threatened by such action in areas where citizens and communities are feeling the effects of climate change.

REPUTATIONAL RISK
Companies that are viewed as undermining actions to address climate change, or have projects and practices that contribute to climate change, risk being the target of damaging public campaigns. Reputational risk can also hinder a company’s ability to compete in the marketplace. In competitive sectors where brand loyalty is a critical element of corporate value, consumer preferences may change with increased demands for climate-compatible goods and a backlash against those products or services that are perceived to contribute to climate change. In a competitive labour market, reputational risk can adversely affect a company's ability to recruit and retain qualified and skilled employees.

COMPETITIVE RISK
Companies that do not address climate change are at risk of lagging behind their competitors with respect to innovation and new product development. Consumer expectations, preferences and needs are likely to change as they become more aware of the impacts of climate change. Demands for more climate compatible goods are likely to increase at the expense of those goods and/or services that are perceived to contribute to the problem.

While the risks associated with climate change pose an imminent threat to Canadian business, there is also an opportunity to manage those risks effectively and leverage a business’ progressive action into a competitive advantage. Turn to page 38 for some useful tools to consider when reporting carbon risks and benefits to stakeholders.

20. Ibid.
25. CERES (2006)
27. Greenpeace (2007)
29. Ethical Funds maintains an active Focus List for Shareholder Action Program (http://www.ethicalfunds.com/pdf2/sri/climate_change.pdf) to encourage better corporate and environmental performance.
CLIMATE CHANGE OPPORTUNITIES

THE OPPORTUNITIES

Companies with a history of working on climate change are now trying to shift their focus from risk management and bottom-line protection to business opportunity and top-line enhancements. Climate change has created business opportunities including new regulatory frameworks, carbon emissions trading schemes, shifting consumer demands and a market for carbon neutral products and services. The interrelated business opportunities yielded by climate change activities include:

CONTRIBUTING TO REGULATORY DEVELOPMENT
Addressing carbon emissions immediately lends credibility to corporate efforts and allows companies to participate in the process of policy and regulatory developments. Companies that contribute to climate-related regulatory development will stay abreast of upcoming legislative changes and widely accepted operational standards. Constructive engagement with government is linked to a shift in focus from risk management to new climate-related business opportunities.

REALIZING COST REDUCTIONS
For many companies, the initial and most significant financial benefits are derived through increased energy efficiencies, operational improvements and resource productivity. Climate change also introduces an innovation opportunity for new GHG friendly or carbon neutral materials and products, leading to new markets and revenue streams. Mechanisms such as carbon cap-and-trade schemes are the most market-oriented opportunities arising from climate change and are therefore the most financially tangible.

ENHANCING CORPORATE REPUTATION
Leadership on climate change through the development of corporate commitments, strategies, reduction targets, new product lines and stakeholder engagement efforts – offers the opportunity for a company to differentiate itself from its competitors. Companies can benefit from these climate change activities by enhancing their brand as a climate change friendly organization. An improved corporate reputation can assist with the recruitment and retention of key talent.

GAINING AND MAINTAINING COMPETITIVE ADVANTAGE
The organizations that recognize the importance of climate change, work to understand the implications for their industry and implement mitigation steps in advance of regulation or policy will prosper. Companies that develop an ability to out-compete sectoral peers on efficiency, driving down the cost of energy and improving margins and profitability, will see an increased competitive advantage. New technology innovation opportunities will be linked to the increased demand for clean and renewable sources of energy. Climate change awareness amongst consumers will likely increase the demand for “climate-friendly” products and services.

Tackling potential shareholder questions early on can help companies reveal key climate change opportunities. Sharing the results of such internal inquiries can enhance reputation. Shareholder questions typically encompass the following areas:

Climate risk mitigation:
Does the organization have a plan of action to assess the potential financial impacts of climate change?

Response to regulatory changes:
How will the company maximize shareholder value as climate change regulations continue to develop and influence business practices?

GHG performance:
How much tonnage does the company currently emit and what are its plans to reduce GHGs?

FIGURE THREE: OPPORTUNITIES THROUGH SHAREHOLDER ENGAGEMENTS

The Fairmont hotel chain was looking for a way to reduce negative impacts on the environment and increase operational efficiencies while enhancing their guests’ hotel experience. Some of the initiatives from “The Fairmont Green Partnership Program” included:

- Tracking energy used in each room though the use of sub-meters in the Hotel Vancouver.
- Allowing guests the opportunity to have their sheets replaced less often, reducing water and energy usage at a number Fairmont locations.
- Replacing and fixing leaky steam traps and fixing leaks to reduce steam consumption by 30 million pounds which saved the Royal York Hotel more than $200,000 annually.
- Installing automated climate control systems in Ottawa’s Château Laurier to return room temperature to a pre-set point upon guest check out.
- Replacing old refrigerators that required ozone-depleting freon.
- Replacing chlorine in the swimming pool with a more pleasant baking soda and salt solution.
- Planting an organic rooftop herb garden at one hotel that produces food for the restaurants and increases guests’ meal enjoyment.

Through their efforts the Fairmont reported an increase in cost savings and a reputation as an environmental leader in the hotel industry, giving the hotel chain a competitive advantage.

Canada’s GHG emissions are per capita among the highest in the world, thus highlighting Canada’s responsibility to play a leading role in the global effort to cut GHG emissions.

Business supports stronger policy as voluntary action by select companies and their investors will not achieve the emission reductions needed to solve the problem.

In the absence of stringent regulations, businesses are forced to demonstrate leadership on climate change and work to advocate and influence government policy.

Federal regulations announced in April 2007 propose to reduce Canada’s emissions to 20% below 2006 levels by 2020.

In May 2007, CBSR initiated an interview series to reveal the challenges faced and progress made by leading organizations as they integrate climate change into their core business strategy and operations.
“It is not enough; in fact it is dishonourable, for Canada to say that Canadians emit only 2% of global GHG emissions and therefore what we do as a nation is irrelevant. Our per capita emissions level is one of the highest in the world, as is our capacity to act.”

Climate Action Network Canada

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**Summary:**

- Strongly increasing emissions.
- Far from reaching the Kyoto target.
- Very high emission rates per capita compared to the average industrialized countries.
- Relatively large share of renewable energy in fuel mix, but almost completely large-scale hydro.
- Plans to exploit oil from tar sands, which is very CO₂ intensive.

“Let us not let the issue of targets get in the way of getting started, in a real, productive and constructive way that benefits our global environment and works to truly position Canada as a global clean energy leader.”

John Drexhage

It is recommended that the government establish a clear framework for business to operate within – one that strikes a balance between regulations and allowing operational freedom. Climate change is a classic ‘catch-22’; governments refrain from introducing new policies to reduce emissions because they fear corporate resistance, while companies find it difficult to take their investments in low-carbon solutions to scale because of the lack of long-term climate policies. The Conference Board of Canada states that a durable Canadian policy requires three basic elements:

i) it requires global engagement, with no free riders among major emitters, while taking action at home to curb our own emissions;

ii) it must include greater clarity on attainable targets for GHG reductions; and

iii) the optimal mix of policies with a heavy reliance on market-oriented solutions.

An ideal policy framework may include a combination of carbon taxes, cap-and-trade systems, specific regulatory intervention and incentives for new technologies, mandated GHG reporting and, support for industries, communities and individuals predicted to be the most affected by climate change impacts.

The National Round Table on Environment and the Economy (NRTEE), takes a similar approach noting that energy and climate policy in the 21st century requires Canada to address both energy use and energy production as reductions will be achieved only if energy is used more efficiently and produced while emitting less carbon. They recommend strict targets for absolute emissions reductions, cooperative and collaborative international partnerships, a Canadian cap-and-trade system and, an economic assessment of the potential costs to our national economy and quality of life from the projected impacts of climate change.
Business supports stronger policy as voluntary action by self-selected companies and their investors will not achieve the emission reductions needed to solve the problem. As government action is inevitable and policy decisions will have substantial implications for future profits, business leaders are increasingly engaging with policy makers to help influence those decisions. Most favour market-based mechanisms such as cap and trade systems that give businesses flexibility either to reduce their own emissions or buy credits from others who can reduce emissions at a lower cost.

The launch of the Montreal Climate Exchange at the end of 2007 creates the first environmental products market in Canada, which will enable emissions trading and the sale of environmental financial products.

Federal regulations announced in April 2007 propose to reduce Canada’s emissions 20% below 2006 levels by 2020—a reduction of 150 megatonnes—and set intensity-based targets, as opposed to absolute emission caps, for industry to achieve this. According to The Pembina Institute, these targets fall short of the requirements based on our scientific knowledge of climate change, the targets adopted by the developed countries making the strongest GHG reduction commitments and, Canada’s legal obligations under the Kyoto Protocol.43

38. G8 countries include Canada, France, Germany, Italy, Japan, Russia, the United Kingdom and the United States.
In May 2007, CBSR initiated an interview series to supplement The Guide with examples of challenges corporations in Canada faced, as they integrate climate change into their core business strategy and operational considerations. Invitations to participate were extended to more than 30 CBSR member and non-member companies. It is worth noting that many of those approached declined to be interviewed. Reasons cited for not participating included concerns that their organization had not yet developed a climate change commitment statement or strategy, had not conducted a comprehensive emissions inventory, had not advanced climate change onto the agenda of senior management or, would prefer to tell their story a year from now when they expect more progress will have been made.

This signals a common vulnerability for big business in Canada and validates the need for CBSR’s Guide and, other climate change resources for business.

The trends, analysis, lessons learned, challenges and successes gleaned from the 13 interviews undertaken, are highlighted throughout The Guide.
The potential impacts of climate change can be understood by focusing on risk management and bottom-line protection. Leaders realize there is a business opportunity and focus on how they can most effectively integrate climate change strategy with core business strategy. Rising energy prices and increased operation efficiency / cost reduction are the top two drivers of climate related strategies, followed closely by social responsibility considerations.\(^{44}\) CERES published the Climate Change Governance Checklist to highlight fourteen specific governance actions for companies to address climate change.\(^{45}\) A comprehensive climate change management program includes an emissions inventory, product development, risk assessment, climate adaptation plan, commitment statement, publicly stated goals and targets, stakeholder engagement and communications strategy.

\(^{44}\) Gathered from CBSR Climate Change Interview Series (May 2007)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining Impacts and Implications</td>
<td>32</td>
</tr>
<tr>
<td>Quantifying GHG Emissions</td>
<td>33</td>
</tr>
<tr>
<td>Assessing Risks and Climate Adaptation Approaches</td>
<td>36</td>
</tr>
<tr>
<td>Developing a Climate Change Action Plan</td>
<td>38</td>
</tr>
<tr>
<td>Formulating Climate Commitment</td>
<td>39</td>
</tr>
<tr>
<td>Statements and Strategy</td>
<td>39</td>
</tr>
<tr>
<td>Establishing Goals and Targets</td>
<td>40</td>
</tr>
<tr>
<td>Evaluating Carbon Management Alternatives</td>
<td>41</td>
</tr>
<tr>
<td>Securing Buy-in and Communicating Progress</td>
<td>45</td>
</tr>
<tr>
<td>Engaging Stakeholders</td>
<td>46</td>
</tr>
<tr>
<td>Climate Reporting and Communications</td>
<td>50</td>
</tr>
</tbody>
</table>
CLIMATE STRATEGY DRIVERS

The potential impacts of climate change can be understood by focusing on risk management and bottom-line protection. Leading organizations however have shifted that focus to climate change as a business opportunity or top-line enhancement and how they can most effectively integrate climate change strategy with core business strategy. This section of the guide contains an overview of a comprehensive climate change management program including an emissions inventory, risk assessment, climate adaptation plan, commitment statement, publicly stated goals and targets, stakeholder engagement and communications strategy. Each component of the program is supplemented with profiles of best practice from the leading companies interviewed as part of this project.

Hoffman (2006) notes that three overarching drivers provide impetus for a company to take action on climate change: cost savings, social responsibility and corporate reputation. An adapted version of a question posed to companies profiled in Getting Ahead of the Curve: Corporate Strategies that Address Climate Change was asked of our sample: “How important were the following drivers in leading your company to pursue its climate-related strategy?” Figure Five outlines both the internal and external drivers of climate-related strategies which align with these three ‘drivers’. As expected, financial considerations including rising energy prices and cost reductions associated with energy and operational efficiencies were cited as the most significant drivers. Social responsibility considerations (“doing the right thing”) also ranked highly as early action on climate is viewed to be consistent with corporate sustainability values. Conversely, climate change management was not viewed as a new strategic direction for most companies and pressure from NGOs was not cited as a significant driver. It is worth noting that more than half of the drivers indicated in Figure Five, had either a significant impact or some impact, on leading a company to pursue a climate-related strategy.

Two CBSR member companies: Catalyst Paper Corporation and Bell Canada, have partnered with the WWF in different capacities:

**Catalyst Paper Corporation** is the first Canadian company to sign a WWF Climate Savers agreement pledging to reduce its CO₂ emissions by 70% below its 1990 levels by 2010, a goal it has already achieved.

**Bell Canada** and WWF-Canada are working to better document and communicate the climate change benefits of Bell’s telecommunications solutions such as teleconferencing, tele-working, energy monitoring and electronic billing. In addition, Bell will donate $1 for every mobile phone or PDA returned through its Mobile Take-Back Program to support WWF-Canada’s climate change and conservation work.

Three overarching drivers provide impetus for a company to take action on climate change: cost savings, social responsibility and corporate reputation. 


47. Ibid.
### FIGURE FIVE: DRIVERS OF CLIMATE RELATED STRATEGIES

<table>
<thead>
<tr>
<th>Driver</th>
<th>Impact Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising energy prices</td>
<td>5</td>
</tr>
<tr>
<td>Increased operational efficiency/cost reduction</td>
<td>4</td>
</tr>
<tr>
<td>Social responsibility considerations</td>
<td>3</td>
</tr>
<tr>
<td>Industry innovation opportunity</td>
<td>3</td>
</tr>
<tr>
<td>Increase employee motivation and engagement</td>
<td>3</td>
</tr>
<tr>
<td>Consistency with existing corporate culture</td>
<td>3</td>
</tr>
<tr>
<td>Leadership opportunity</td>
<td>3</td>
</tr>
<tr>
<td>Remaining competitive with industry peers</td>
<td>3</td>
</tr>
<tr>
<td>Compliance with projected regulations</td>
<td>3</td>
</tr>
<tr>
<td>Improving corporate reputation among consumers</td>
<td>3</td>
</tr>
<tr>
<td>Protecting the global climate</td>
<td>3</td>
</tr>
<tr>
<td>Shareholder demands for accountability</td>
<td>3</td>
</tr>
<tr>
<td>Compliance with existing regulations</td>
<td>3</td>
</tr>
<tr>
<td>Policy advocacy opportunity</td>
<td>3</td>
</tr>
<tr>
<td>Opportunity for new sources of capital</td>
<td>3</td>
</tr>
<tr>
<td>New strategic direction for company</td>
<td>2</td>
</tr>
<tr>
<td>Pressure from NGOs</td>
<td>1</td>
</tr>
</tbody>
</table>

All data gathered from CBR interview series conducted in 2007.
CERES published the Climate Change Governance Checklist to highlight 14 specific governance actions for companies seeking to address climate including:

01 Assigning a director’s committee for environmental affairs.
02 Conducting a board-level review of climate change strategies.
03 Having the Chief Environmental Officer report directly to the CEO or to an executive committee.
04 Making attainment of GHG emissions targets an explicit factor in employee compensation.
05 Issuing a clear statement from the CEO about the company’s climate change strategy.
06 Including a statement on climate risks and opportunities in its securities filings.
07 Issuing a sustainability report.
08 Calculating emissions savings and offsets from projects.
09 Inventorying emissions and reporting results to shareholders.
10 Establishing an emissions baseline to gauge trends.
11 Making projections of future emissions and setting targets to manage and control them.
12 Hiring a third-party auditor to certify emissions data.
13 Participating in an external GHG emissions-trading program.
14 Purchasing or developing renewable energy sources.

Leading organizations view climate change as a business opportunity or top-line enhancement and are focusing on how they can most effectively integrate climate change strategy with core business strategy.

A GHG emissions inventory exercise can lead to a heightened consciousness of climate change issues within a company and set the stage for a wider analysis of the strategic risks and opportunities posed by the emissions.

Risk management is generally recognized as a starting point for addressing climate-related vulnerabilities.

Once an emissions inventory and preliminary risk assessment is done, the next steps include developing and implementing company-wide goals and policies to reduce climate risk exposures, reducing emissions, instituting corporate preparedness plans and making climate risk initiatives public.

The same basic concepts apply to corporate preparedness and business-continuity management (BCM) for climate risk as for other risks, as each organization must understand the potential means by which climate risk could affect their operations, resources, reputation competitive advantage and financial position.
QUANTIFYING GHG EMISSIONS

Businesses will not have similar environmental impacts but GHG emissions are significant to the performance of all sectors. GHG management programs are influenced by factors such as industrial sector, types of emissions, business growth, geographic distribution of operations and corporate culture. A GHG emissions inventory exercise can lead to a heightened consciousness of climate change issues within a company and set the stage for a wider analysis of the strategic risks and opportunities posed by emissions, including any potential liability or exposure.

A well-designed and maintained GHG inventory can serve several business goals including managing risks and identifying reduction opportunities, assisting with public and mandatory reporting initiatives, participating in GHG markets, gaining recognition for early voluntary action and subsequently measuring and reporting progress.

Generally accepted financial accounting and reporting principles influence and drive GHG emissions accounting and reporting to ensure that the disclosed information represents a true, accurate and fair account of an organization's emissions. The GHG Protocol Corporate Accounting and Reporting Standard is the most widely accepted and used standard for mandatory and voluntary GHG programs. The standard and guidance were designed to achieve the following objectives:

> To provide business with information that can be used to build an effective strategy to manage and reduce GHG emissions;
> To provide information that facilitates participation in voluntary and mandatory GHG programs; and,
> To increase consistency and transparency in GHG accounting and reporting among various companies and GHG programs.

An emissions inventory will make an explicit link between an organization's climate impact and energy use as energy consumption patterns are also disclosed. Companies should be aware of the range of possible emissions categories and the extent to which their business activities contribute to each one. Figure Eight illustrates the operational boundaries to facilitate mapping direct and indirect emissions.

Steps for a comprehensive emissions inventory include:

- Defining operational and organizational boundaries
- Identifying direct and indirect emissions
- Selecting a base year
- Collecting data
- Gathering emissions factors for each activity
- Calculating emissions
- Setting goals and targets

“Efforts to integrate adaptation to climate change into decision making are limited by information gaps, unproven risk management approaches and a lack of knowledge among business and financial leaders.”

Greg Hoover and John Roberts

Figure Seven: Top Ten Tips – Developing Your Carbon Footprint

01 Have a clear understanding of why you are developing your carbon footprint and use a recognized standard to guide the process.

02 Use external expertise to help kick-start the process.

03 Engage your colleagues to ensure accurate and timely data.

04 Develop a business case to gain senior management support.

05 Develop clear indicators.

06 Consider the carbon footprint across your value chain.

07 Be transparent about how business changes impact your carbon footprint.

08 Develop a road map with manageable steps to enable you to reach end goal.

09 Build in-house expertise.

10 Empower people to get involved. Identify internal champions not only to be active participants in existing initiatives but to encourage others to be part of the process.


The Vancouver Port Authority views climate change as an opportunity to become the green port of choice and a leader in addressing climate impacts associated with marine transport. The Port has conducted:

→ extensive climate risk assessments, corporate preparedness exercises and adaptation planning including hydrological modelling projections with 50, 75 and 100 year timelines;

→ community impact evaluations, and water salination studies.

The expansion planned for the third berth at the Deltaport was also designed to incorporate the changes predicted as a result of these efforts.
FIGURE EIGHT: GREENHOUSE GAS IMPACT OPERATIONAL BOUNDARIES

SCOPE 1
DIRECT

SCOPE 2
INDIRECT

SCOPE 3
INDIRECT

PURCHASED ELECTRICITY

GAS FOR MANUFACTURING

COMPANY OWNED VEHICLES

RAW MATERIALS PROCESSING

RAW MATERIALS

PROCESSING

MATERIALS PRODUCTION

EMPLOYEE TRAVEL

WASTE MANAGEMENT

WASTE MANAGEMENT

WASTE MANAGEMENT

CONTRACTOR OWNED VEHICLES

CO₂  SF₆  CH₄  N₂O  HFC₅  PCF₅

Source: New Zeland Business Council for Sustainable Development
“The effects of climate change must be taken into account when it comes to technical design, financial evaluation and delivery methods for all goods and services.”

Greg Hoover and John Roberts

ASSESSING RISKS AND CLIMATE ADAPTATION APPROACHES

Risk management is generally recognized as a starting point for addressing climate-related vulnerabilities. With time and experience, companies shift their climate strategies to emphasize business opportunities and top-line enhancements. For a company to fully understand the risks posed by climate change and their potential impacts — and whether those risks and impacts are near-term and sudden, versus long-term and gradual — a comprehensive climate risk map should be developed to rank risks by frequency and severity. Figure Nine outlines a standard risk assessment framework for analyzing potential impacts of climate change.


FIGURE NINE: STEPS IN THE RISK MANAGEMENT PROCESS

Establishing context
> define the business to be assessed and the scope of the assessment;
> clarify the objectives of the company;
> identify stakeholders and their interests and concerns;
> establish success metrics against which business risks can be evaluated;
> determine key functional areas of the company to structure the process; and
> determine potential climate change scenarios for the assessment.

Identifying risks
> describe and list how climate changes could impact each functional area of the company.

Analyzing risks
> review established policies, procedures and responses that deal with each specific risk;
> assess the consequences of each risk against business objectives, taking into account the extent and effectiveness of existing controls;
> form a judgment about the likelihood of each identified risk leading to the consequences identified; and
> determine the level of risk to the organization, for each of the climate change scenarios used in the analysis.

Evaluating risks
> reaffirm the judgments and estimates;
> rank the risks in terms of their severity;
> screen out minor risks which would otherwise distract the attention of management; and
> identify those risks for which more detailed analysis is recommended.

Treating risks
> identify relevant options to manage or adapt to the risks and their consequences; and
> select the best options, incorporate these into forward plans and implement them.

FIGURE TEN: TOP TEN CONSIDERATIONS – CARBON RISKS AND BENEFITS DISCLOSURE

01 Respond to the Carbon Disclosure Project (CDP). Investors are increasingly requesting information on carbon risks and benefits to incorporate climate change impacts into their investment decisions. Each year the CDP sends a climate change questionnaire to the largest publicly listed companies globally.

02 Carbon and climate risk is just another business risk that needs to be strategically managed and treated as carefully as any other. Stakeholders will be interested in understanding how your business assesses and manages the risks.

03 Describe the opportunities and explain how they are integrated into corporate strategy.

04 Report on climate and carbon issues in the context of your business.

05 Break down information to fit your business operations. Not only do emissions intensity and climate change-related risks vary within sectors but there can also be substantial variations between countries of operation and subsidiaries.

06 Use a known standard to report your carbon footprint.

07 Engage investors on the issue where it is material to your business.

08 Use your position on climate change to gain competitive advantage.

09 Report forward-looking information focusing on the expected financial implications of climate change and potential risks.

10 Companies actively implementing climate change strategies can further their commitment through industry/regional collaboration and engaging key stakeholders such as employees, customers, and suppliers in their impact reduction efforts.

Publicly stated climate change commitments generally include the company’s current position on climate change, its responsibility to address climate change and its engagement with governments and advocacy organizations to affect climate change regulation and policy.\(^{57}\)

In making the business case for climate mitigation, companies typically focus on cost reductions and operational improvements associated with energy efficiency projects.

Once the business case for the climate strategy has been developed it is critical to engage stakeholders, measure progress towards stated goals, communicate setbacks and successes and continue to monitor and anticipate regulatory actions which may adversely impact the strategy.

To succeed in reducing carbon emissions, an organization will need both targets and technology, which will be created by analyzing risks and opportunities within their many business units.\(^{58}\)

Setting public emissions targets is the best indicator of a serious commitment and, while they are not legally binding, they do put real pressure on companies to perform.\(^{59}\)

For companies who have not actively pursued energy efficiency and operational improvements, there are likely to be many “low-hanging fruit” opportunities to make immediate progress against stated emissions reductions goals.

For companies who have already captured low hanging fruit, continued improvement can be achieved through collaborative research and development (such as the business-to-business partnerships between Talisman Energy Inc. and the University of Saskatchewan or Westport Innovations and Terasen Gas), refining current programs/policies to maximize savings, educating and engaging employees, ensuring all areas of sustainability are addressed (waste, air quality, water, transport) and by opening dialogue with key stakeholders to harness feedback and solutions.
A climate strategy can be defined as the set of goals and implementation plans within a corporation that are intended to reduce GHG emissions, produce significant GHG reduction co-benefits, or that otherwise respond to climate related changes in markets, public policy or the physical world.60

Andrew Hoffman

Enbridge has developed a Climate Change Policy that has been approved by senior management. The policy outlines the company’s engagement with various levels of government and other stakeholders to help policy makers better understand the company’s business. The policy reinforces full support for the GHG emission reduction targets set by the Corporate Social Responsibility Committee of the Board and encourages all Canadians to work towards reducing their own GHG emissions.
“Targets are generally expressed in accordance with four parameters: start date, target achievement date, base year (reference year) and a specific quantity of targeted emissions based on a percentage of the reference year’s emissions. Each sets a target that limits its emissions at some predetermined and measurable amount, representing a downward trend and delivering some guaranteed environmental performance.”

The Partnership for Climate Action

Since 2001, TELUS Corporation has had a target to reduce energy consumption per unit of revenue by 10% by 2007. They are currently at 6%, due mainly to solid revenue growth based on more efficient use of energy. In 2003, a GHG intensity target of 2% reduction year over year (also normalized to revenue) was added and has since been met. A 20% reduction in absolute GHG emissions was also achieved between 2003 and 2006.

ESTABLISHING GOALS AND TARGETS

To succeed in reducing carbon emissions, an organization will need both targets and technology. Goals and targets need not be limited to GHG reductions but can also include strategic initiatives and climate adaptation strategies. Ultimately the goals must fit the company’s capabilities, culture and business model.64

Most companies develop goals by analyzing risks and opportunities within their many business units. Energy efficiency targets and GHG reduction targets are often developed in parallel. However many organizations also link broader environmental goals such as water and waste minimization, to efficiency improvements and climate mitigation efforts. Energy efficiency offers near-term realized financial benefits while the value of GHG reductions are more difficult to quantify and connect to a company’s bottom line. In making the business case for climate mitigation, companies typically focus on cost reductions and operational improvements associated with energy efficiency projects.

Climate targets should be sensibly linked to organizational goals and companies should avoid creating one universal reduction target. Developing a set of diverse targets related to emissions reductions, cost savings, operational improvements among others across different business units that all contribute to overall business objectives will be most effective.65

More than any other action, setting public emissions targets is the best indicator of a serious commitment and while they are not legally binding, they do put real pressure on companies to perform.66 Leading organizations...
EVALUATING CARBON MANAGEMENT ALTERNATIVES

With no shortage of options to reduce carbon emissions and address climate change, perhaps the more difficult task is determining which solutions, or mix of solutions will reduce emissions on the scale of what is needed to avoid disastrous climate change impacts. The evaluation of options is often conducted in an iterative fashion with goal setting. Some companies set goals and then search for ways to achieve them while others consider options for reducing emissions and then set goals accordingly. Ultimately, the goal is to find ways to reduce GHG emissions in a manner that supports other business objectives.

An increased emphasis on energy efficiency can help slow the pace at which climate change risk increases, not reverse the trend. For companies who have not actively pursued energy efficiency and operational improvements, there is likely to be much “low-hanging fruit” and opportunities to make immediate progress against stated emissions reductions goals. Increasing energy efficiency applies to all aspects of a company’s operations from product design, raw materials sourcing, infrastructure, transportation, manufacturing, production processes and the useful end life of products.

A range of criteria can be used to evaluate and prioritize reduction activities including but not limited to:

> costs to implement;
> collateral benefits to the company, the environment and the community;
> an understanding of the opportunities inherent in the emissions inventory;
> net return on investment;
> time to implement;
> contribution to the core business;
> contribution to brand image;
> barriers to implementation; and
> other derived indirect GHG reductions such as water efficiency standards and recycled content procurement policies.

Leading companies have now started to explore potential opportunities beyond efficiencies including: creating new climate-friendly products and services to serve emerging markets; sourcing new fuel or renewable types; reducing losses through operational or infrastructure improvements; finding alternate uses for recovered gas; implementing carbon capture and sequestration systems; and, developing customer, employee and supply-chain engagement programs. For a more comprehensive overview of offsetting and carbon neutrality, please refer to Section Four, Page 55, of this guide.


Catalyst Paper Corporation achieved its goal of a 70% reduction in emissions over 1990 levels by 2010 – an amount equal to eliminating nearly one million tonnes of GHGs annually. This goal has been realized by switching to cleaner fuels like renewable biomass, improving production efficiency and using methane gas recovered from a landfill as energy for its Paper Recycling Division.

Both Bell Canada and TELUS Corporation cite their ability to provide Canadians with telecom products and services that offer added value in terms of GHG reductions. Transferring information rather than people or materials via teleconference or videoconference, will result in fewer emissions and other environmental benefits such as decreased paper use.
The Overwaitea Food Group (OFG) has a long history of demonstrating commitment to the environment. It has twice been awarded BC Hydro’s Power Smart Excellence Award, most recently in 2007 in the category of “Outstanding Energy Efficiency Project”. Recently constructed and renovated stores include energy efficiency measures such as high output lighting and energy efficient heaters on glass-door freezers. In addition to these features, newer store designs include a glycol heat reclaim system that takes heat generated by the refrigeration system and redistributes it throughout the store, significantly reducing natural gas consumption; timed bakery ovens that only pre-heat and operate when needed; and a building automation system that automatically adjusts operating systems like lighting, heating and air-conditioning based on occupancy. Thanks to these improvements, on an annual basis, in its British Columbia stores alone, OFG saves enough electricity to light over 6,175 family homes.\(^71\)

**FIGURE ELEVEN: GHG REDUCTIONS – LOW-HANGING FRUIT**

**LIGHTING**
Lighting consumes 40% of electricity in commercial buildings and is accountable for another 10% of the cost of cooling the heat it produces.

**Maximize daylight:** Install skylights and larger windows. High-efficiency windows are the most common daylighting tool producing excellent transmission of visible light and low thermal conduction. Windows with a higher head (top) will allow light to creep farther into the building.

**Increase bulb efficiency:** Use lower wattage and more efficient fluorescent bulbs. Compact fluorescent bulbs may cost more up-front, but, they last longer, require less labour than incandescent bulbs and, use less energy.

**Install dimmer switches:** Using task lamps and dimmer switches will personalize employee workspaces and improve comfort levels.

**Install light shelves:** These shelves have a reflective surface inside or outside of a building located at the base of windows. Their function is to reflect light deeper into the building and into places where natural light is needed most – on ground floors and in internal cavities.

**Use low-wattage ‘Exit Signs’:** These reduce energy usage 24 hours a day.

**Use occupancy sensors:** These sensors automatically turn off lights in unoccupied rooms.

**Utilize automatic devices:** Technologies such as power monitors and smart meters will reduce energy consumption.\(^69\)

**HEATING AND COOLING**
Space heating and cooling accounts for nearly 30% of primary energy usage in commercial buildings.

**Increase insulation:** Using higher “R-value” insulating materials will reduce the rate of heat transfer to and from the outside environment.

**Replace windows:** Use windows that employ non-conductive argon gas between the panes and low-emissivity coatings. Low cost alternatives are window films and shades that help to limit heat transfer.

**Coat roofs:** Use white or reflective roofing materials or coatings to reflect heat and cool buildings by reducing ambient temperatures and lowering the ‘heat island’ effect.

**Install thermostats in workstations:** Allowing employees to fine-tune their working environments, increasing their comfort and productivity.

**Adjust heat settings:** During winter, heat your building to a maximum of 21°C when occupied, 16°C when unoccupied.

**Reduce temperatures:** In vestibules, stairwells, lobbies and unused spaces reduce or simply turn off heating.

**Install building automation systems:** These systems can save 5-30% in energy costs, and have a payback of two to four years depending on the hours of operation used, type of system, and equipment controlled.\(^70\)

**COMPUTERS AND APPLIANCES**
Across Canada, appliances in standby mode are estimated to be using at least 5.4 terawatt-hours. Reducing stand-by power consumption alone could generate enough electricity to power every household in Manitoba and Prince Edward Island.

**Exercise power management:** Encourage employees to use their PCs power management...
features or have the information technology (IT) department do it.

**Look for ENERGY STAR labels:** ENERGY STAR software used to enable “sleep mode” on PC monitors can save $10/year with monitor - approximately 170 kWh/year/monitor.

**Turn off monitors:** Encourage employees to turn off their PC monitors when away from their computers. Activate screen savers for each PC to secure further reductions.

**Specify 80 PLUS power supply when ordering computers:** 80 PLUS certification ensures that a computer’s power supply is at least 80 per cent efficient and will save 88 kWh/year/computer.

**Turn off photocopiers:** Operating photocopy equipment efficiently by turning it off after hours, will reduce energy use by 25% or more.

**Consider laptops:** Laptops provide mobility for staff and use 50% less energy than the average desktop unit.72

**TRANSPORTATION**

On road transportation accounts for 17.9% of Canada’s total GHG emissions.

**Explore alternatives to plane trips:** Air travel is the most carbon intensive travel method; consider teleconferencing and videoconferencing as alternatives to in-person meetings.

**Consider teleworking:** Using communications technology to work at a distance rather than commuting is an alternative to traditional commuting for some employees.

**Encourage car pooling:** Create incentives for employees to use car pools or other alternative methods for their work commute, such as walking, cycling, and mass transit.

**Offer transit passes:** Provide discounts on mass transit to employees or allow employees to use pre-tax dollars to pay for commuting.

**Encourage cycling:** Provide a place where employees can secure their bicycles.

**Evaluate office locations:** Consider proximity to public transportation as a key factor when relocating offices.73

AT&T estimates that in 1999, its teleworkers avoided 87 million miles of driving, preventing emissions of 41,000 tons of CO₂, 93,000 tons of nitrogen oxides, 1.4 million tons of carbon monoxide, and 180,000 tons of hydrocarbons.74
When evaluating carbon management options, it is obvious that the most attractive approaches are those that result in emissions reductions, cost savings, increased efficiency, operational improvements and strengthened competitive advantage.

Fred Wellington and Rob Bradley

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**Figure Twelve: Metrics of Success for Climate Strategies**

Figure Twelve outlines the most important metrics of climate change program/initiative success as cited by our interview participants. Easily quantifiable metrics such as improved energy efficiency or cost savings were noted as very important while those that are more difficult to measure such as improving risk management approaches or protecting the global climate were assigned somewhat less relative importance. A number of respondents indicated that protecting the global climate is an ambitious goal but, one that cannot be influenced by the actions of one company.

![Graph showing metrics of success for climate strategies]

Stakeholder engagement is essential in this age of accountability. Best practice companies are providing opportunities for employees, customers and suppliers to learn how to reduce GHG emissions.

To mobilize an entire organization on climate change and ensure the integration of climate strategy with key business objectives, a company must communicate reduction targets, identify and empower internal champions and ‘horizon-scan’ to flag changes in legislation, reputation or stakeholder expectations.

The extent to which climate roles and responsibilities are defined and institutionalized throughout the company is another determinant of success.

Most companies have moved past the debate of climate change and are acknowledging that it is an important business issue via a range of forums including corporate websites, sustainability reports and in public addresses delivered by executives. Similarly, companies are making a stand and investing in specific climate change events, research pieces and resources.

Communication of actions, commitments and strategies can help to demonstrate that the company is integrating its climate change targets strategically into its business operations.
Petro-Canada conducted an extensive stakeholder mapping exercise in early 2007 to develop strategic positioning and climate change priorities from a corporate perspective. The stakeholder map included customers, government, regulators, media, NGOs, industry associations, employees, potential employees, shareholders, business partners, competitors, representatives of the financial community, ethical investors and the public at large.

The RBC Financial Group has also proactively conducted a stakeholder mapping exercise – specific to climate – and disclosed the results on their website. They spoke with clients, employees and environmental NGOs to gain a better understanding of their issues and expectations, as these relate to climate change and other environmental issues.

**ENGAGING STAKEHOLDERS**

Stakeholder engagement is essential in this age of accountability. Organizational change can be a complex process and this is especially true relative to efforts to alter policies and practices regarding climate change as future potential economic and environmental benefits are pitted against immediate, bottom-line pressures and costs. It is important to develop a dialogue with stakeholders around climate change with messages that are action-oriented and solutions-based. An organization’s climate stakeholders will typically include employees, shareholders, customers, suppliers, NGOs, the public at large, government, stock analysts, industry associations, insurance providers and others. This Guide highlights employee, supply chain and business-to-business partnerships, as key stakeholder engagement opportunities, pages 46-49.

**EMPLOYEES**

As with other business objectives, external perception of corporate action on climate change must not be different from internal reality. To mobilize an entire organization on climate change and ensure the integration of climate strategy with key business objectives, a company must communicate reduction targets, identify and empower internal champions and horizon-scan to flag changes in legislation, reputation or stakeholder expectations. Hoffman (2006) notes that employees will devise innovative ways to achieve climate goals when they understand the linkage with the company’s vision and values as communications strategies work best if climate issues are linked to more familiar issues. Active and visible senior leadership remains critical.

Much has been written about effective change management and many of the same best practices apply to the integration of climate change such as:

1) supporting a broad base of change agents within the organization;
2) building internal capacity;
3) fostering a culture of empowerment;
4) allowing sufficient time and resources for implementation; and
5) communicating early, fully and often.

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“Climate advocates need to present visionary, positive messages: find the best possible organizational leaders and allies rather than waiting for the ideal; be flexible and use creative approaches to provoking and guiding organizational change.”

Keith James

Scotiabank held several in-house screenings of “An Inconvenient Truth,” Al Gore’s Oscar-winning documentary on climate change. Senior leaders also speak to employee focus groups across the company to build awareness of the organization’s climate impact and how they can contribute to minimizing not only Scotiabank’s, but their own carbon footprint.

“When our employees saw the risks of climate change, they got very creative designing solutions that reduced our emissions and helped our bottom line by lowering costs and improving productivity.”

Translink, the Greater Vancouver Transportation Authority includes climate-related topics in weekly employee newsletters. For example, the results of the Angus Reid polls conducted in March 2007 identifying trends in climate change perceptions and Canadian’s willingness to alter behaviours were summarized and circulated to employees along with a high-level analysis of how these trends could impact the company and the provision of public transit.

All of the companies within the CBSR Climate Change Interview Series identified a number of successful tactics to engage employees including: videotaped messages from the CEO; promoting transit ridership; hosting Lunch ’n’ Learn events with topics related to climate change, energy efficiency and environmental stewardship; and supporting employee-led Green Teams working to drive organizational improvements. There was also anecdotal evidence of the intangible employee-related benefits derived from internal engagement activities in that they may enhance employee recruitment and retention efforts.

The positioning of climate change within the organization chart and at the Board level is significant as it speaks to the priority assigned to the issue. Beyond the job title of the person responsible for climate change, the extent to which climate roles and responsibilities are defined and institutionalized throughout the company is another determinant of success. While the initial organizational champions of climate change were leaders within Environmental or CSR departments, this portfolio is increasingly being shared with other departments such as corporate affairs, business development, strategic planning, marketing and engineering or maintenance operations.

SUPPLY CHAIN
As current climate mitigation efforts have focused on internal operational improvements, cost reductions and energy efficiencies, there are fewer examples of companies who are managing the carbon footprint of their products across the supply chain. Best practice companies, however, are leveraging their supply chain.

Key areas that companies can review within its supplier practices for all purchased goods and services include:
1. All processes for extracting natural resources and producing materials, including energy usage;
2. Any transportation of materials purchased;
3. Outsourcing of services, machinery, buildings and other business-related activities; and
4. Usage and disposal of products by final customer.

PARTNERSHIPS
In the shift to a more carbon constrained world business will ultimately have to meet consumer needs in a way that generates fewer carbon emissions and collaboration across the value chain has the potential to realize very large reductions. Business partnerships will likely prove to be one of the most effective means of addressing climate change risk and taking advantage of commercial opportunities.

A number of leading companies are developing product carbon footprints. To create a product carbon footprint the Social Purchasing Network recommends the following steps: 83

- Identifying and mapping the supply chain of a particular product.
- Approaching identified supply chain companies and gathering information on their emissions and energy usage.
- Identifying high leverage areas for emissions reduction that lead to efficiencies and cost savings.
- Engaging supply chain companies in developing reduction plans and supporting them throughout the implementation of these strategies.

**Marks and Spencer**, a large UK retailer, has a goal of making their company carbon neutral. They have determined that a majority of their emissions come from their suppliers and customers so collaboration with those stakeholders is essential for Marks and Spencer to meet their goal. A few of their strategies include:

- Sourcing as much food locally as possible and investing in research and development projects to help UK farmers improve production.
- Working with a supplier to open a ‘green’ factory and creating four ‘green’ model retail outlets.
- Sharing best practices with their supplier network.
- Developing low carbon products for customers and creating campaigns to increase awareness at the consumer level.


**In 2003**, **Westport Innovations** and **Terasen** developed and engineered a system to enable the capture and reuse of Liquefied Natural Gas (LNG). LNG used in the testing of Westport’s heavy-duty engine fuel system is injected to the Terasen pipeline for use by other commercial and residential customers. Since its installation, the system has prevented the emission of more than 15,000 tonnes CO\textsubscript{2} equivalent (CO\textsubscript{2}e).

Source: Marks & Spencer (2007), Marks & Spencer launches “Plan A”- £200m ‘eco-plan’ www.marksandspencer.com

**FIGURE FOURTEEN: ENGAGING YOUR SUPPLY CHAIN**
CLAIRE REPORTING AND COMMUNICATIONS

Effective and comprehensive climate change communication involves:
i) public acknowledgement of climate change;
ii) dimensions of climate change material to industry and business;
iii) linkages to and integration with business strategy;
iv) company performance; and,
v) position on public policy.

Most companies have moved past the debate of climate change and are acknowledging that it is an important business issue via a range of forums including corporate websites, sustainability reports and in public addresses delivered by executives. Some organizations use a narrative approach which provides the rationale for their actions and demonstrates a willingness to engage in dialogue while others issue formal position statements on climate change that are used as baseline references. Figure Fifteen outlines the GHG reporting frameworks that publicly traded Canadian companies can use to report or disclose emissions, risks, targets and other elements of their climate strategies.

Leadership companies disclose the dimensions of climate change that are material to their industry and business including risks and opportunities and in doing so, prioritize actions to be taken. Opportunities such as new product development and improved energy efficiency are also highlighted in order to provide a balanced discussion on how climate change can provide positive impacts on business value.

Companies communicate organizational commitments and business strategies to address climate change. Commitments may be near or long-term goals and targets and, business strategies may range from board level policies to facilitating consumer actions to seeking collaborative partnerships with external organizations. The communication of actions, commitments and strategies can help to demonstrate that the company is integrating its climate change targets strategically into its business operations. Climate change reporting is most prevalent in the energy and financial services sector. This trend is not surprising due to the link between energy and GHG emissions and the emerging new opportunities to provide financial services related to climate change.


“The private sector will play a key role in responding to the growing market for energy and / or climate-friendly goods and services and for the innovation necessary to transition to a low-carbon future. When businesses go public about integrating climate change into their bottom lines, it sends a powerful message about the realities of climate change and the means of addressing it.”

John Atcheson
Canadian publicly traded companies currently report GHG emissions data through various voluntary and regulatory reporting mechanisms:

- Voluntary corporate CSR, sustainability or environmental reports;
- Climate Change Registry (formerly the Voluntary Challenge Registry);
- Facility-level GHG reporting in Ontario and Alberta via the provincial Ministry of the Environment;
- Statistics Canada for large industrial emitters with annual emissions >100 Kt; and
- Industry association initiatives such as Responsible Care (chemicals), Canadian Association of Petroleum Producers’ Stewardship Initiative (petroleum) and Towards Sustainable Mining (minerals and metals).

There are also international GHG reporting frameworks such as:

- World Resources Institute/World Business Council for Sustainable Development GHG Reporting Protocol; and
- ISO 14064 GHG Quantification, Reporting and Verification Standard.

A common theme identified from the interview series includes: How an organization’s sustainability report provides an effective forum to communicate progress and challenges on climate change and a range of other environmental issues. A sustainability report provides the mechanism by which leading companies can leverage and profile their climate change management program.

“Frame the issue in the context of higher-level values such as responsibility, stewardship, vision, ingenuity. Actions to prevent climate change should be characterized as being about new thinking, new technologies, planning ahead, smartness, forward-thinking, balanced alternatives, efficiency, prudence and caring.”

Simen Retallack

**Candid corporate comments:** The companies profiled in this Guide have faced challenges and realized success via their ongoing efforts to minimize the climate impact of their operations and/or products. Each was asked to provide some candid observations about the obstacles or barriers they have faced or continue to struggle with. The following is a sample of some of those comments:

→ “Goals and targets will be achieved when climate change is viewed as a business issue and not solely an environmental issue.”

→ “Internal communications in a large organization with a global presence is still a challenge.”

→ “With an increased focus on climate change and carbon footprint, there is some concern that we are diluting other important CSR or sustainability messages.”

→ “There is not a lot of “low-hanging fruit” going forward; we need to prioritize our next actions.”

→ “We are concerned that perhaps we are getting too far ahead of the pack.”

→ “We must identify and implement key performance indicators (KPIs) to ensure accountability for climate change.”

To further relate action on climate and achievement towards earlier-stated commitments, companies publish year over year data on GHG emissions to indicate progress towards reduction targets. A discussion of performance is included to provide additional understanding of success or setbacks in meeting or falling short of targets. It should also be noted that report readers often assess management commitment to issues such as climate change in part by the seniority of managers responsible for the issue.

Business leaders publicly acknowledge the need for climate regulation, engage in public policy dialogue and communicate the company’s position in the development of these public policies. Increasingly, transparency of corporate influence on climate policy is becoming a CSR issue as lobbying efforts are undergoing scrutiny as a measure of CSR performance.

The current best practices for communicating climate change have been influenced by marketing, psychology, and education:

→ Recognize that information is not sufficient. People do not learn alone as consumption choices are part of social conversations about status, social cohesion, group norms and the pursuit of personal and cultural meaning. Enabling people to change means changing what is socially acceptable.

→ Find ways to make positive behaviours into unconscious habit.

→ Simplify message and prioritize action steps.

→ Do not make people feel bad, irrelevant and/or useless. Help people to understand (and trust) that they are making a difference.

→ Balance the solution to the scale of the problem.

→ Choose credible messengers. Not just those with scientific authority but common-sense and likable intermediaries and trusted NGOs.

→ Motivate people to change as a region, a town, a team or other personal identity group.

→ Help people move beyond small, insignificant or token behavioural change.

→ Make it a pleasure – associate positive behaviour not with duty but with leisure, pleasure, health or fulfillment.

Figure Seventeen illustrates the noted importance of various stakeholder groups or audiences when considering the communication of climate change related strategy and progress. Many of our case study organizations made a distinction between climate change communications as both an attraction and recruitment vehicle for new employees and an important retention tool for current employees.

Offsetting is a way of compensating for the emissions produced by a business, an individual, an event or an activity with an equivalent carbon savings.

Offsetting involves the purchase of emission reduction or carbon credits generated by initiatives that have reduced GHG emissions such as small-scale or large industrial renewable energy projects, energy efficiency technologies or reforestation efforts.

Companies need to take a multi-dimensional approach reviewing both strategic and regulatory considerations when determining the quality of voluntary offset products in this rapidly growing market.

To become carbon neutral, the footprint or impact of the company, product or event involved must first be measured and the steps to reduce emissions to zero identified.

Standardization about what it means to be carbon neutral will provide those companies wanting to voluntarily make a commitment to reduce their climate impact with much needed clarity and confidence.89

“Getting offsets right means stepping back to appreciate that climate change is driving political, economic, social and technological shifts that are fundamentally changing businesses’ relationship with the environment and that offsets provide a qualitatively unique yet minor lever for improving and sustaining financial and environmental performance.”

Business for Social Responsibility

Once an organization has completed a GHG emissions inventory and efforts have been made to reduce those emissions, carbon offsetting is available as a means of further mitigating its climate change impact by taking full responsibility for those remaining emissions. Offsetting is a way of compensating for the emissions produced by a business, an individual, an event or an activity with an equivalent carbon savings. As there is a limited availability of zero carbon intensity energy and materials, most organizations will be unable to reduce emissions associated with their activities, products and/or services to zero in the short-term.

Offsetting involves the purchase of emission reduction or carbon credits generated by initiatives that have reduced GHG emissions such as small-scale or large industrial renewable energy projects, energy efficiency technologies or reforestation efforts. In practice, offsetting is done in two stages:

Step 1. calculating the amount of emissions to be offset from the activity carried out with results of calculations presented in the form of carbon, CO₂ or CO₂ equivalent; and

Step 2. investing in projects that prevent or remove an equivalent amount of emissions from the atmosphere.³¹

It is important to note the difference between voluntary offsetting and carbon trading to meet a compliance requirement. Regulated companies may buy or sell whatever legal instruments are the most cost-effective to achieve a target whereas voluntary offsetting activities consist of project offsets purchased to compensate for a specific emission and may not be resold.³²

A comprehensive overview of the carbon markets and cap and trade mechanisms such as those established under the Kyoto Protocol or the European Union’s Emissions Trading Scheme (EU ETS) is beyond the scope of this Guide. Please refer to Carbon Finance: Carbon Finance: The Financial Implications of Climate Change by Sonia Labatt and Rodney White for a Canadian perspective on this global business issue. Additional information can be found within the Tools and Resources section of this guide.

As a rapidly growing market, determining the quality of voluntary offset products can pose a challenge and requires both strategic considerations and a methodological approach. Businesses should be wary of purchasing offsets that have not met rigorous quality standards, as the public relations fallout from offsets that are later exposed as disingenuous can be damaging.

The basic components of a process for carbon offsetting include:
i) defining project goals;
ii) evaluating options in the marketplace;
iii) determining benefits and limitations of offset projects;
iv) ensuring quality through additionality and verification; and
v) communicating commitment.29

The documents listed in Figure Nineteen are comprehensive guides on the subject and explain offset issues related to quality, pricing, screening criteria, project eligibility, additionality, social impacts and verification among others.

The lack of formal regulation in the voluntary market has attracted criticism. The implementation of The Voluntary Carbon Standard and the Gold Standard for Voluntary Offsets developed by the WWF and partner organizations has aimed to provide greater confidence in this market. The Voluntary Carbon Standard (www.v.c.e.org) was launched in July 2007 and provides project eligibility, criteria, verification, certification and registration processes for emissions reduction projects. The Gold Standard (www.cdmgoldstandard.org) looks beyond the volume of projected emissions reductions and considers issues such as local stakeholder support and the promotion of sustainable development goals.24 In addition, the UK’s Department for Environment, Food and Rural Affairs (DEFRA) has launched a consultation on a voluntary Code of Best Practice for carbon offsetting.

To become carbon neutral, the footprint or impact of the company, product or event involved must first be measured and the steps to reduce emissions to zero identified. While in principle this may appear to be a straightforward process, there are a number of issues that may affect the credibility of the claim including the scope of emissions (both upstream and downstream) included in the footprint to be neutralized, how many reductions are made before using offsets and the quality of the actual offsets themselves. As with offsetting, standardization about what it means to be carbon neutral will provide those companies wanting to voluntarily make a commitment to reduce their climate impact with much needed clarity and confidence.25

US-based Business for Social Responsibility has compiled a list of companies, non-profits, government agencies, events and jurisdictions that are claiming to be, or announcing their intent to become carbon neutral.26 With the number of claims or intentions growing in both number and type, NGOs and businesses will need to work together to set guidelines for carbon neutrality.
The Carbon Trust three stage approach to developing a robust offsetting strategy.


Tufts University Climate Initiative Voluntary Offsets for Air-Travel Carbon Emissions: Evaluations and Recommendations of Voluntary Offset Companies.

Whatever mix of incentives and regulation is provided, climate reduction strategies simply have to be intelligently designed for the long-term, so that businesses have the consistency and clarity they need for planning their investments and their operation.”

Patron: HRH The Prince of Wales

FIGURE TWENTY: SO YOU WANT TO BE A CARBON NEUTRAL LEADER?

Companies that seek to do more than reduce their own carbon emissions may want to develop climate change strategies adopted by other leading businesses. These are some ideas for developing your own strategy:

→ Get your own house in order – follow the steps outlined in this guide.
→ Offer innovative products and services that address climate change and enable your customers to reduce their footprints (e.g. green car loans, green building materials, locally produced goods and services).
→ Use your purchases and investments to influence the behaviour of your suppliers and to get those who manage your money to invest in sustainable companies.
→ Provide public education and awareness on climate change issues and what they can do about them.
→ Work with others through carbon neutral working groups and stakeholder collaborations to influence local, provincial and federal governments to take action on climate change.


97 Patron: HRH The Prince of Wales
A common theme throughout this Guide shows the need for businesses to:

- take ownership of their emissions; and
- commit to a range of actions required to reduce their carbon footprint. In the absence of stringent regulations, strong political leadership and a real price on carbon emissions, businesses find themselves in a very powerful position to influence societal behaviour through their influence with customers, suppliers, employees and other stakeholders.

This Guide demonstrates that climate change has become a reputational and strategic business issue for those sectors not currently regulated. A comprehensive GHG management framework including an emissions inventory, target-setting, an evaluation of carbon reduction alternatives and the disclosure of impacts, is required for all organizations to position climate change as the core business issue it has become. Quantifying emissions, improving energy efficiencies and engaging key stakeholders are the initial steps all companies must take to achieve the large-scale reductions in emissions needed in a relatively short time to avoid the more extreme impacts associated with higher CO₂ concentrations in the atmosphere.

The challenge posed by climate change will also require a range of possible solutions; economic systems such as cap-and-trade systems, carbon markets, fees and taxes; regulatory mechanisms; and technological developments like carbon capture and sequestration and, new renewable forms of energy.

While increased energy efficiency, operational improvements and new climate-friendly products and services have their place, these actions are not yet at the scale needed to meet emissions reduction objectives or mitigate the most serious consequences associated with climate change – financially and environmentally – as illustrated by various reports. It is apparent that, longer-term and more difficult fixes include conservation, regulation and enforcement, meaningful incentives, political will, leadership and action. Business will be expected to lead this fundamental shift from the tactics outlined in this guide to long-term, sustainable approaches that conserve the natural environment and strengthen social and economic infrastructure. Leaders need to initiate this critical dialogue, moving the conversation beyond science to enable a discussion of solutions, values and vision for the future.


products, procedures and management systems such as ISO 14064 to manage, reduce, monitor, report and measure GHG emissions. CSA acquired Canada’s Climate Change Voluntary Challenge and Registry Inc. (VCR Inc.) on January 1, 2005; a voluntary publicly accessible national registry of GHG baselines, targets and reductions. The primary objective of this registry renamed the Canadian Greenhouse Challenge Registry is to challenge both current and potential registrants from all economic sectors and geographic regions to demonstrate meaningful actions which contribute towards the reduction of Canada’s GHG emissions.

THE CARBON DISCLOSURE PROJECT
www.cdproject.org
The Carbon Disclosure Project (CDP) is a coalition of 280 institutional investors (including 25 in Canada) globally managing more than $40 trillion in assets. It recognizes that climate change is becoming a driver of long-term shareholder value and it encourages companies to understand and disclose the implications of climate change to their business. The CDP is the world’s largest registry of corporate GHG emissions data with the aim to inform institutional investors about the organizational risks and opportunities presented by climate change. In 2008, the CDP sent a request to more than 2,000 companies and the success of the CDP is indicative of the growing willingness of companies to share their current and future policies regarding climate change.

CARBON FOOTPRINTS IN THE SUPPLY CHAIN:
THE NEXT STEP FOR BUSINESS
www.carbontrust.co.uk/Publications/publicationdetail.htm?productid=CTC616
Stabilizing climate change will require fundamental changes to the way that businesses deliver products and services to consumers. This research identifies radical new ways for businesses to cut carbon emissions across their supply chain by analyzing the carbon impact at all stages of a product’s lifecycle. Two pilot studies run with Walkers and Trinity Mirror in the UK identified savings worth 29,000 tonnes of CO2, and £2.7 million a year.

THE CARBON NEUTRAL COMPANY
www.carbonneutral.com
Founded in 1997, The CarbonNeutral Company created some of the tools which have now been widely adopted: legal contracts for carbon credits, carbon calculators, positive messaging that aims to spur action and “measure, reduce, offset”; the mantra of CarbonNeutral, its registered trademark. The CarbonNeutral Company offers carbon offset and climate consulting services to help its clients measure, reduce and offset their emissions. With headquarters in London and an international network of offices, The CarbonNeutral Company works with over 200 large corporations and thousands of small-to-medium sized enterprises (SMEs) and individuals on carbon offset projects, climate-consulting in the area of measurement, reductions and strategy and climate marketing services.

CARBON TRUST
www.carbontrust.co.uk
The Carbon Trust is a private company established in 2001 by the British government in response to the threat of climate change, with the aim of accelerating the move to a low-carbon economy. To achieve this goal, the Carbon Trust works in five complementary business areas: Insights, Solutions, Innovations, Enterprises and Investments which in turn explain, deliver, develop, create and finance low-carbon enterprise.

CHICAGO CLIMATE EXCHANGE
www.chicagoclimatex.com
The Chicago Climate Exchange (CCX) is the world’s first and North America’s only legally binding rules-based GHG allowance trading system. CCX members are leaders in GHG emissions management and represent all sectors of the economy as well as public sector innovators. CCX emitting members make a voluntary but legally binding commitment to meet annual GHG emission reduction targets. Those who reduce below the targets have surplus allowances to sell or bank; those who emit above the targets, comply by purchasing CCX Carbon Financial Instrument (CFITM) contracts. The CCX supports trading between offset providers (such as farms and forests) to offset purchasers (such as producers and users of fossil fuels) for offset projects in North, South and Central America, which are registered on the exchange. The CCX register is supported by third-party verifiers, many of whom are also working with the EU ETS.

CLIMATE ACTION NETWORK
www.climateactionnetwork.ca
The Climate Action Network Canada (CAN Canada) is composed of member organizations and individuals committed to preventing dangerous levels of human interference with the global climate system, protecting environmental sustainability and public health, while upholding principles of just transition, equity and social justice. Its mission is to support and empower Canada’s governments, private sector, labour and civil society by designing, developing and implementing effective strategies to reduce GHG emissions.
at international, national and local levels. CAN
Canada promotes solutions and provides a
basis for collaborative action and a forum for
communication, policy development and
coordination to its independent members
recognizing that preventing dangerous
interference with the global climate system will
involve significant changes in the way society
utilizes energy, natural resources and land.

THE CLIMATE CHANGE GOVERNANCE
CHECKLIST
www.ceres.org/pub/docs/Ceres_corp_gov_
and_climate_change_0306.pdf
This report examines how 20 of the world’s
largest corporate emitters of GHGs are
factoring climate change into their business
strategies and governance practices. Effective
corporate responses are built on a foundation
of well functioning environmental management
systems and properly focused governance
practices. This foundation is the critical first
step companies must take to make meaningful
progress in controlling their emissions and
orienting their businesses for a carbon
constrained world. The report identified 14
specific governance actions for companies to
address climate.

THE UKCIP BUSINESS AREAS CLIMATE
IMPACTS ASSESSMENT TOOL (BACLIAT)
www.ukcip.org.uk
This tool provides a simple checklist for
organizations to assess the potential impacts
of climate change on their business. The
checklist can be used at the level of a single
organization or an entire business sector to
courage consideration and a more compre-
hsive understanding of the climate risks
and opportunities under the broader headings
of logistics, finance, markets, process, people,
premises and management implications.

THE CLIMATE GROUP
www.climategroup.org
The Climate Group is an independent, non-
profit organization dedicated to accelerating
the international uptake of corporate and
government best practice in emissions
reduction. Proactive companies, states,
regions and cities around the world are
demonstrating that the cuts in GHG required
to stop climate change can be achieved while
growing the bottom line. Using the work of
these leaders as a catalyst, The Climate Group
strives to accelerate international action on
global warming with a new, strong focus on
practical solutions.

THE CONFERENCE BOARD OF CANADA
www.conferenceboard.ca
In partnership with The Carbon Disclosure
Project secretariat, The Conference Board of
Canada produces an annual CDP report focusing
on the carbon management strategies and
disclosure practices of the 280 most valuable
TSX companies, by market capitalization.

THE CORPORATE LEADERS GROUP ON
CLIMATE CHANGE
www.cpi.cam.ac.uk/programmes/energy_and_
climate_change
The Corporate Leaders Group (CLG) on
Climate Change in the UK was convened by
the University of Cambridge Programme for
Industry on behalf of HRH The Prince
of Wales's Business and the Environment
Programme. It operates from the position
that only by taking ambitious domestic policy
action will the UK be able to convince rapidly
developing countries such as China and India
that the UK and its EU partners are serious
about tackling climate change. The CLG
sent their first letter to Prime Minister Tony
Blair in May 2005, offering to work with the
Government to strengthen climate policy in
the following seven areas:
1. Strengthening markets for emissions
reductions;
2. Support for “early-stage” low-carbon
technologies;
3. Scaling up low-carbon investment in rapidly
developing economies;
4. Improving energy efficiency in the large
commercial sector;
5. Stimulating consumer action on
climate change;
6. Strengthening product and building
regulations; and
7. Reducing the impact of transport on
climate change.

In 2007, the CLG recommended that a
strengthened EU ETS should be key to the
UK’s climate change strategy and calls on the
government to ensure that non ETS countries
are provided with strong incentives to
participate. The EU ETS should be broadened
to include sectors such as aviation that are
expected to generate an increasing share of
overall emissions. The governments within
the EU should set clear targets for the ETS
out to 2021 so that not only the businesses
represented by the CLG but all businesses
can have the confidence to make long-term
investments in emissions reduction.

DAVID SUZUKI FOUNDATION
http://www.davidsuzuki.org/Climate_Change/
What_You_Can_Do/carbon_neutral
Since 1990, the David Suzuki Foundation
has worked to find ways for society to live in
balance with the natural world that sustains
us. Focusing on four program areas – oceans
and sustainable fishing, climate change and
clean energy, sustainability, and the Nature
Challenge - the Foundation uses science
and education to promote solutions that
conserve nature and help achieve sustainability
within a generation. Its climate change and
clean energy program promotes sustainable
solutions to energy needs, from renewable
sources like wind and solar power, to energy
efficiency and improved public transportation.
The David Suzuki Foundation’s Carbon Neutral
program provides background information,
resources, and guidance on best practices for
businesses, individuals, and others who want
to reduce and/or offset their climate footprint.

EARTHWATCH INSTITUTE
www.earthwatch.org
The Earthwatch Institute is an international
non-profit organization that supports scientific
field research by offering volunteers the
opportunity to join global research teams.
Earthwatch recruits more than 4000 volunteers
every year to collect field data in the areas of
rainforest ecology, wildlife conservation,
marine science, archaeology and more. They
have published a Climate Change Position
Statement which outlines their commitment to
a sustainable environment via the promotion
of research and education around the science,
impacts and responses to climate change.
Earthwatch addresses climate change by
focusing research, influencing government
agencies, not-for-profit organizations and the
private sector to address climate change,
developing education and engagement
programs specific to climate and striving to
minimize the Institute’s own carbon footprint.

THE EUROPEAN UNION EMISSIONS TRADING
SCHEME (EU ETS) 103
www.europa.eu.int/comm/environment/climat/
emission.htm
The EU ETS represents the European Union’s
commitment to spearhead efforts to combat
climate change, both by setting an example,
and by fulfilling its pledge to reduce its
emissions by 8% from 1990 levels by 2012.
The EU ETS came into effect in January 2005,
prior to the ratification of the Kyoto Protocol
and is the largest multi-country, multi-sector
GHG emissions trading scheme. It is a cap
and trade system which covers CO2 emissions
from approximately 12,000 installations in
27 countries and six major industrial sectors.
TOOLS AND RESOURCES

Proposals are currently being considered to include CO₂ emissions from aviation and non-CO₂ gases in industrial applications. It allows access to the Kyoto project mechanisms including Joint Implementation (JI) and the Clean Development Mechanism (CDM). These allow projects in developed and developing countries that can cover six GHGs and all emitting sectors. The EU is actively engaged with other governments at national and state levels to allow the linking of emergent trading systems with the EU ETS. There are good reasons to suspect that the EU ETS or a system similar to it will feature strongly in an emergent context of climate risk and provides further background information and examples of adaptation strategies and options. It includes a simple adaptation checklist which identifies key principles that are in alignment with good adaptation decisions. The principles suggest that good adaptation is founded on the engagement of an informed community with a willingness and ability to adapt.¹⁰⁴

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
www.ipcc.ch
Recognizing the problem of global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988. The role of the IPCC is to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation. The IPCC does not carry out research nor does it monitor climate related data or other relevant parameters. It bases its assessment mainly on peer-reviewed and published scientific/technical literature. A main activity of the IPCC is to provide in regular intervals an assessment of the state of knowledge on climate change.

THE INTERNATIONAL EMISSIONS TRADING ASSOCIATION
www.ieta.org
The International Emissions Trading Association (IETA) is a non-profit business organization created in June 1999 to establish a functional international framework for trading GHG emission reductions. Its membership includes leading international companies such as Alcan, Ontario Power Generation, Suncor and Transalta. The IETA is dedicated to the objectives of the United Nations Framework Convention on Climate Change (UNFCC), the establishment of effective market-based trading systems for emissions that are demonstrably fair, open, efficient, accountable and consistent across national boundaries and maintaining society equity and environmental integrity while establishing such systems.

THE KYOTO PROTOCOL ¹⁰⁵
www.unfccc.int/2860.php
The Kyoto Protocol came into force in February 2005. As of January 2007, 166 countries and other governmental entities had ratified the Accord. Ratifying countries have committed to reduce, by 2008-12, their emissions by 5.2% below their 1990 levels. Under Kyoto’s main

THE GREENHOUSE GAS PROTOCOL
www.ghgprotocol.org
The GHG Protocol is a multiple-stakeholder partnership of business, NGOs, and governments, led by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It is an excellent source of information about corporate GHG accounting and reporting and draws on the expertise and contributions of individuals and organizations from around the world. The GHG Protocol Initiative comprises two separate but linked standards:

i) GHG Protocol Corporate Accounting and Reporting Standard provides comprehensive guidance on accounting for and reporting corporate GHG emissions and is the most widely used standard for mandatory and voluntary GHG programs; and

ii) GHG Protocol Project Quantification Standard a guide for quantifying reductions from GHG mitigation projects. Other international standards, such as the ISO 14064 standard, are also compatible with the GHG Protocol. The standards are analogous to the generally accepted financial accounting standards for companies’ consistent accounting and reporting practices.

GRI REPORTING INITIATIVE INDICATORS SPECIFIC TO CLIMATE CHANGE
www.globalreporting.org/Home
The Global Reporting Initiative (GRI) is a system that issues sustainability guidelines for reporting on the economic, environmental and social dimensions of corporate activities, products and services. Using the GRI guidelines, companies can disclose significant information regarding their climate risk in a manner that is similarly aligned with the Carbon Disclosure Project. Exactly how organizations should communicate their response to climate change is a question facing many companies, particularly since the introduction of the new indicator in the G3 guidelines (EC2: Financial Implications and Other Risks and Opportunities for the Organization’s Activities due to Climate Change). Other indicators specific to climate change within the GRI include EN16 which allows for disclosure on the total amount of GHG emissions and EN18 which discloses total reductions achieved and initiatives for reducing the amount of emissions produced.

WORLD RESOURCES INSTITUTE (2006)
HOT CLIMATE, COOL COMMERCE:
A SERVICE SECTOR GUIDE TO GHG MANAGEMENT
Because heavy industry is a leading source of GHG emissions, most of the business-focused programs responding to the problem emphasize participation by “emitters,” manufacturers and utilities. Action by industry alone, however, is not enough. Long term solutions require emissions reduction efforts by the entire economy, and this publication addresses service-sector companies such as banks, law firms, retailers and real estate managers. A description of the comprehensive steps needed to plan and develop a GHG inventory and manage GHG emissions is provided. This guide uses the established framework of the GHG Protocol to ensure that service-sector companies develop effective climate change response strategies that are compatible with others in the business community and voluntary and mandatory climate change programs.

IDENTIFYING ADAPTATION OPTIONS
UK CLIMATE IMPACTS PROGRAMME
www.ukcip.org.uk
Identifying Adaptation Options explores the nature and characteristics of adaptation in the context of climate risk and provides further

GOLD STANDARD
www.cdmgoldstandard.org
The Gold Standard offers a quality label to Clean Development Mechanism (CDM) / Joint Implementation (JI) voluntary offset projects. The Gold Standard is endorsed by more than 40 non-governmental organizations worldwide and is preferred by a range of government and private sector companies. Renewable energy and energy efficiency projects with sustainable development benefits are eligible.

THE CLIMATE CHANGE GUIDE – CBSR
principle, governments are separated into developed countries, referred to as Annex 1 countries (which have accepted GHG emissions reduction obligations); and developing countries, referred to as Non-Annex 1 countries (which, although they do not have legally binding GHG caps, must submit and monitor their annual GHG inventory).

The Protocol provides three mechanisms:
1. Emissions trading among Annex 1 countries;
2. Joint Implementation (JIs) which allow Annex 1 nations to obtain emission credits (Emission Reduction Units – ERUs) for projects that reduce emissions in other Annex 1 countries; and
3. Clean Development Mechanisms (CDMs) whereby Annex 1 countries can obtain permits (Certified Emission Reduction units – CERs) for projects that reduce emissions in non-Annex 1 countries. This allows countries to earn credits for establishing or assisting climate-friendly projects in developing nations.

Parties to the UN Framework Convention on Climate Change (UNFCCC) will meet in Bali to continue negotiating the successor to the Kyoto Protocol which expires in 2012. Businesses are looking for clear signals from governments that the Kyoto mechanisms will continue post-2012 and be built upon.

MAY DAY BUSINESS SUMMIT ON CLIMATE CHANGE 2007
www.maydaycompany.org.uk
Another recent example of business collaboration is HRH The Prince of Wales’s May Day: Business Summit on Climate Change 2007. Attended by more than 1,000 business leaders, it provided an opportunity to share experiences, learn from one another and commit to action after the day itself. It marked the beginning of a nation-wide movement of businesses taking action on climate change and making commitments to mobilize their company, employees, suppliers and customers.

MONTREAL CLIMATE EXCHANGE
www.m-x.ca/accueil_en.php
The Montreal Exchange in partnership with the Chicago Climate Exchange will launch the Montreal Climate Exchange (MCeX) carbon futures contract by the end of 2007. The new MCeX is expected to generate the price signal required by large GHG emitters to manage the risks associated with the so-called “price of a tonne of carbon”.

THE NATIONAL ROUND TABLE ON THE ENVIRONMENT AND THE ECONOMY
www.nritteetnee.ca
The National Round Table on the Environment and the Economy (NRTEE) is dedicated to exploring new opportunities to integrate environmental conservation and economic development, in order to sustain Canada’s prosperity and secure its future. Its mission is to generate and promote innovative ways to advance Canada’s environmental and economic interests in combination, rather than in isolation. In this capacity, it examines the environmental and economic implications of priority issues and offers advice on how best to reconcile the sometimes competing interests of economic prosperity and environmental conservation. The membership of the NRTEE includes distinguished leaders in business and labour, universities, environmental organizations, Aboriginal communities and municipalities. It acts as an advocate for positive change, raising awareness among Canadians and their governments about the challenges of sustainable development and promoting viable solutions.

OFFSETTERS
www.offsetters.ca
Offsetters assists companies with their climate change mitigation efforts by developing and customizing GHG accounting systems, identifying offset choices that are consistent with a corporate brand, verifying that an organization has truly gone carbon neutral and providing advice on reducing the volume of emissions throughout the supply chain. In alignment with their philosophy to promote the mainstream adoption of next generation energy systems, Offsetters funds are invested in renewable energy and energy efficiency projects that would not have taken place without their involvement. Working with industry, municipal and financial partners, they are in the process of establishing heat recovery projects in North America. International projects are provided in collaboration with Climate Care, a world leader in the provision of sustainable offsets.

THE PEMBINA INSTITUTE
www.pembina.org
The Pembina Institute is an independent, not-for-profit environmental policy research and education organization that envisions a world in which our immediate and future needs are met in a manner that protects the Earth’s living systems; ensures clean air, land and water; prevents dangerous climate change; and provides for a safe and just global community. Pembina’s major policy research and education programs are in the areas of sustainable energy, climate change, environmental governance, ecological fiscal reform, sustainability indicators and the environmental impacts of the energy industry. Its current climate change work includes monitoring and reporting on the federal government’s progress in implementing the full range of policies and measures needed to meet Canada’s emission reduction target under the Kyoto Protocol, outlining the case for deep emission reductions post-2012 and working for the implementation of regulations to reduce Canadian emissions through a system of targets and trading.

PEW CENTER ON CLIMATE CHANGE
www.pewclimate.org
The Pew Center on Global Climate Change brings together business leaders, policy makers, scientists and other experts to advance the belief that collaborative effort will protect the climate while sustaining economic growth. The Pew Center has issued 92 reports from leading researchers on key climate topics such as economic and environmental impacts and practical domestic and international policy solutions. Through their 43-member Business Environmental Leadership Council (BELC) they work to shape policy and chart practical solutions to climate change. The BELC consists of primarily Fortune 500 companies who together employ more than 3.8 million people and represent $2.8 trillion in market capitalization. It is now the largest U.S. based association of corporations focused on addressing the challenges of climate change.

PLANETAIR
www.planetair.ca
Planetair is a not-for-profit service offered by the Unisféra International Centre. Launched in 2005, Planetair aims to help individuals, corporations, and institutions to reduce their climate footprint. Unisféra generates and disseminates knowledge on a broad range of sustainable development issues and offers research, consulting and training services to public and private organizations. Unisféra’s team is comprised of jurists, economists, scientists and engineers, as well as experts in management, communications, public policy, and international relations.

POINT CARBON
www.pointcarbon.com
Point Carbon is a leading provider of independent news, analysis and consulting services for European and global power, gas and carbon markets. Point Carbon offers a real-time news service with the latest developments and prices in the world’s carbon markets, market research services to understand the implications of
TOOLS AND RESOURCES:

market trends and trading analytics/tools to allow clients to trade and manage risks in the power, gas and carbon markets.

POLLUTION PROBE
www.pollutionprobe.org
Pollution Probe is a Canadian environmental organization that defines environmental problems through research, promotes understanding through education and presses for practical solutions through advocacy. Its Climate Change Programme activities are designed to help Canada achieve its current and future climate change targets and focus on renewable energy and Green Power, transportation efficiency programs, forest carbon management and climate change impacts and adaptation assessments. Pollution Probe has also worked in partnership with health organizations to explore the relationship between climate change and human health and has actively engaged in the development of standards for GHG reporting systems at the international and national levels.

SUSTAINABILITY PURCHASING NETWORK
www.buysmartbc.com/
The Sustainability Purchasing Network is a resource for organizations, including large and small firms, governments and non-profit organizations, seeking to minimize the negative and enhance the positive environmental and social impacts of purchasing. The Network provides training, tools, on-line forums, resources, business-to-business projects and advisory services on environmental and social purchasing. They run workshops on reducing the carbon in your supply chain, introducing sustainability purchasing to your organization and integrating sustainability into your tendering toolkit, and are available for on-site training and advice. Publications include: Guide to the Business Case Benefits of Sustainability Purchasing and Trends and Drivers for Sustainable Purchasing.

UK CLIMATE IMPACTS PROGRAMME
www.ukcip.org.uk
The UK Climate Impacts Programme (UKCIP) helps organizations assess how they might be affected by climate change and how to prepare for its impact. Established in April 1997, UKCIP is funded by the Department for Environment, Food and Rural Affairs (Defra) and based at the University of Oxford. UKCIP works with its stakeholders to coordinate research on how climate change will have an impact at regional and national levels.

UNITED NATIONS GLOBAL COMPACT
www.unglobalcompact.org
The UNGC is a network of concerned business leaders and non-profit groups 5,000 members strong which seeks to implement 10 principles in the area of human rights, labour, environment, and anti-corruption. UNGC recently published Caring for Climate: Tomorrow’s Leadership Today which showcases innovative examples of Global Compact participants addressing climate change.

THE UNIVERSITY OF CAMBRIDGE PROGRAMME FOR INDUSTRY
www.cpi.cam.ac.uk
The Cambridge Programme for Industry works with senior leaders internationally to help them understand and respond effectively to the most significant social and environmental challenges that face their organizations now and in the future. The Programme for Industry is actively involved in three projects related to climate change:

1. The Climate Project (UK) is a climate leaders training initiative which brings together UK leaders to help them communicate the challenges of climate change and explore ways of taking further action. Developed in partnership with Al Gore’s initiative The Climate Project.

2. The Corporate Leaders Group on Climate Change brings together business leaders from major UK and international companies to work with government to develop new and longer-term policies for tackling climate change (see page 65).

3. The Climate Leadership Programme builds capacity in organizations to address the challenges and opportunities of climate change. Developed in partnership with The Climate Group and Duke University.

VOLUNTARY CARBON STANDARD
www.vcs.org/
The International Emissions Trading Association (IETA), the Climate Group, the WBCSD and the World Economic Forum announced the completion of the Voluntary Carbon Standard (VCS) Framework in July 2007. The VCS will introduce a stringent quality assurance to the market and underpin consumer confidence, market credibility and innovation in low carbon technologies. It will be a global standard applicable to all project types in all jurisdictions.

WORLD BANK CARBON FINANCE
www.carbonfinance.org
The World Bank Carbon Finance Unit (CFU) uses money contributed by governments and companies in OECD countries to purchase project-based GHG emission reductions in developing countries and countries with economies in transition. The emission reductions are purchased through one of the CFU’s carbon funds on behalf of the contributor, and within the framework of the Kyoto Protocol’s Clean Development Mechanism (CDM) or Joint Implementation (JI).

Unlike other World Bank development products, the CFU does not lend or grant resources to projects, but rather contracts to purchase emission reductions similar to a commercial transaction, paying for them annually or periodically once they have been verified by a third party auditor. The selling of emission reductions - or carbon finance - has been shown to increase the bankability of projects, by adding an additional revenue stream in hard currency, which reduces the risks of commercial lending or grant finance. Thus, carbon finance provides a means of leveraging new private and public investment into projects that reduce GHG emissions, thereby mitigating climate change while contributing to sustainable development. The Bank’s carbon finance operations have demonstrated numerous opportunities for collaborating across sectors, and have served as a catalyst in bringing climate issues to bear in projects relating to rural electrification, renewable energy, energy efficiency, urban infrastructure, waste management, pollution abatement, forestry, and water resource management.

The World Bank’s carbon finance initiatives are an integral part of the Bank’s mission to reduce poverty through its environment and energy strategies. The threat climate change poses to long-term development and the ability of the poor to escape from poverty is of particular concern to the World Bank. The impacts of climate change threaten to unravel many of the development gains of the last several decades. The Bank is therefore making every effort to ensure that developing countries can benefit from international efforts to address climate change.

WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT
www.wbcsd.org
The World Business Council for Sustainable Development (WBCSD) is a CEO-led, global association of nearly 200 companies dealing exclusively with business and sustainable development. The Council provides a platform for companies to explore sustainable development, share knowledge, experiences and best practices and to advocate business positions on these issues in a variety of forums, working
with governments, non-governments and intergovernmental organizations.

The overarching objective of the WBCSD Energy and Climate focus area is to promote and facilitate interaction and dialogues on energy sustainability and its related policy frameworks. The WBCSD interacts with international bodies such as the IPCC and the UNFCCC and focuses on post-2012 discussions and the development of the “Kyoto” flexible mechanisms, an area where more efforts are needed to make the Clean Development Mechanism (CDM) workable and attractive for the private sector.

The GHG Protocol Initiative (GHG Protocol) is a joint initiative of the WBCSD and the World Resources Institute (WRI) that aims to harmonize GHG accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting.

**WORLD RESOURCES INSTITUTE**

www.wri.org

The World Resources Institute (WRI) was founded in 1982 and is an environmental think tank that goes beyond research to find practical ways to protect the earth and improve people’s lives. Its mission is to move human society to live in ways that protect Earth’s environment and its capacity to provide for the needs and aspirations of current and future generations. The WRI organizes its work around four key goals:

i) reverse rapid degradation of ecosystems and assure their capacity to provide humans with needed goods and services;

ii) guarantee public access to information and decisions regarding natural resources and the environment;

iii) protect the global climate from further harm due to emissions of GHGs and help humanity and the natural world adapt to unavoidable climate change; and

iv) harness markets and enterprise to expand economic opportunity and protect the environment.

By conducting independent research and developing innovative policy and business options, WRI is promoting an effective international and US response to climate change. In particular, WRI aims to:

> Develop robust international agreements and US policies to protect the climate system;

> Foster widespread investment in climate-friendly energy and transportation technologies; and

> Reduce GHG emissions through clean alternatives supported by businesses, governments, nongovernmental organizations, and the public.

**WORLD WIDE FUND FOR NATURE / WORLD WILDLIFE FUND CLIMATE SAVERS PROGRAM**

www.panda.org/about_wwf/what_we_do/climate_change/index.cfm

The World Wide Fund for Nature (WWF) and World Wildlife Fund Canada (a member of the global network) is working with leading companies to turn the necessity of carbon management into a business advantage. Climate Saver companies have set ambitious goals and targets and made innovative commitments to reduce their GHG emissions. Current Climate Saver agreements are with Catalyst Paper Corporation, Johnson and Johnson, IBM, Nike, Polaroid, Sony, Lafarge, Tetra Pak and Novo Nordisk.

**ZEROFOOTPRINT**

www.zerofootprint.net

Zerofootprint is a not-for-profit organization that combines financial and environmental engineering, social networking tools and business intelligence to create products and services that help large corporations, organizations and individuals significantly reduce their environmental footprint. Zerofootprint aims to be the world’s leading brand in green by generating thought leadership and designing practical solutions to solve global problems.

"Considering the costs of reducing GHG emissions but not the costs of failing to reduce emissions is highly misleading: if insufficient action is taken to curb GHG emissions, climate change impacts are likely to result in very large financial costs.”

AccountAbility


104. UKCIP (2007) “Identifying Adaptation Options” Available at www.ukcip.org


### FLIGHT TRAVEL
The CarbonNeutral Company  
www.carbonneutral.com
Atmosfair  
www.atmosfair.de
Climate Care  
www.climatecare.org
Offsetters  
www.offsetters.ca
TerraPass  
www.terrapass.com
Sustainable Travel International  
www.sustainabletravelinternational.org/offset
Zerofootprint  
www.zerofootprint.com

### BUSINESS OR INDUSTRIAL EMISSIONS CALCULATORS
GHG Protocol  
www.ghgprotocol.org
Climate Friendly  
www.climatefriendly.com/business
The Carbon Trust  
www.carbontrust.co.uk
Safe Climate  
www.safeclimate.net/calculator
Paper Usage Calculator  
www.environmentaldefense.org/papercalculator

### VEHICLE TRAVEL EMISSIONS
Certified Clean Car  
www.certifiedcleancar.com
Target Neutral  
www.targetneutral.com
TerraPass  
www.terrapass.com
Cool Drive Pass  
www.cooldrivepass.com
Cool Driver  
www.cooldriver.org
Drive Neutral  
www.driveneutral.org
Driving Green  
www.drivinggreen.com

### ABBREVIATIONS AND ACRONYMS
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>BAT</td>
<td>Best Available Technology</td>
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<tr>
<td>BAU</td>
<td>Business as Usual</td>
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<tr>
<td>BCM</td>
<td>Business Continuity Management</td>
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<tr>
<td>CCS</td>
<td>Carbon Capture and Storage</td>
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<tr>
<td>CCX</td>
<td>Chicago Climate Exchange</td>
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<tr>
<td>CDM</td>
<td>Clean Development Mechanism</td>
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<tr>
<td>CDP</td>
<td>Carbon Disclosure Project</td>
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<tr>
<td>CERs</td>
<td>Certified Emission Reduction units from the Clean Development Mechanism</td>
</tr>
<tr>
<td>CERES</td>
<td>Coalition of Environmentally Responsible Economies</td>
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<tr>
<td>CH₄</td>
<td>Methane</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
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<tr>
<td>CO₂ₑ</td>
<td>Carbon Dioxide Equivalent</td>
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<tr>
<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<tr>
<td>EF</td>
<td>Emission Factor</td>
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<tr>
<td>EPA</td>
<td>Environmental Protection Agency (U.S.)</td>
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<tr>
<td>ET</td>
<td>Emissions Trading</td>
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<td>EU ETS</td>
<td>European Union Emissions Trading Scheme</td>
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<td>GHG</td>
<td>GHG</td>
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<tr>
<td>GRI</td>
<td>Global Reporting Initiative</td>
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<td>GWP</td>
<td>Global Warming Potential</td>
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<td>IETA</td>
<td>International Emissions Trading Association</td>
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<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
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<td>ISO</td>
<td>International Standards Organization</td>
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<tr>
<td>JI</td>
<td>Joint Implementation</td>
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<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
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<tr>
<td>LEED</td>
<td>Leadership in Energy and Environmental Design</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>PPM</td>
<td>Parts Per Million</td>
</tr>
<tr>
<td>SRI</td>
<td>Socially Responsible Investment</td>
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<tr>
<td>SO₂</td>
<td>Sulphur Dioxide</td>
</tr>
<tr>
<td>UKCIP</td>
<td>United Kingdom Climate Impacts Programme</td>
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<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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<td>WBCSD</td>
<td>World Business Council on Sustainable Development</td>
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<td>WRI</td>
<td>World Resources Institute</td>
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<td>WWF</td>
<td>World Wide Fund for Nature</td>
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</table>
## Glossary of Terms

### A

**Absolute Target**
A target defined by reduction in absolute emissions over time (i.e. reduces CO₂ emissions by 25% below 1990 levels by 2010)

**Adaptation**
An adjustment in natural or human systems in response to actual or expected climate stimuli (variability, extremes and changes) or their effects, which moderates harm or exploits beneficial opportunities.

**Adaptive Capacity**
The ability of a system to adjust to climate change (including variabilities and extremes) to moderate potential damages, to take advantage of opportunities or to cope with the consequences. Adaptation can be spontaneous or planned and can be carried out in response to or in anticipation of changes in climatic conditions.

**Additionality**
Criterion for assessing whether a project has resulted in GHG emission reductions or removals in addition to what would have occurred in its absence. Additionality is an important criterion when the goal of the project is to offset emissions elsewhere. Emissions reductions are additional if they occurred because of the presence of incentives associated with the existence of GHG markets, voluntary or mandatory.

**Afforestation**
The process of establishing and growing forests on bare or cultivated land which has not been forested in recent history.

**Annex 1 Countries**
Defined in the International Climate Change Convention as those countries taking on emissions reduction obligations: Australia, Austria, Belgium, Belarus, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Sweden, Switzerland, Ukraine, United Kingdom, USA.

### B

**Baseline**
The emission of GHGs that would occur without the contemplated policy intervention of project activity.

**Base Year**
A reference year against which emissions performance is measured over time.

**Base Year Emissions Recalculation**
Recalculation of emissions in the base year to reflect a change in the structure of the company, or to reflect a change in the accounting methodology used. This ensures data consistency over time.

**Best Available Technology (BAT)**
With respect to energy consumption, the use of current best available technologies can reduce energy intensity levels.

**Biofuels**
Fuel made from plant material i.e. wood, straw and ethanol from plant matter.

**C**

**Cap-and-Trade System**
A system that sets an overall emissions limit, allocates emissions allowances to participants and allows them to trade emissions credits with each other.

**Carbon Asset**
The potential of GHG emissions reductions that a project is able to generate and sell.

**Carbon Capture and Storage**
A long-term alternative to emitting CO₂ to the atmosphere is capturing it at its source of emission and storing it. Geological carbon storage involves the injection of CO₂ into subsurface geological formations.

**Carbon Credits**
Carbon credits are reductions in GHG emissions that can be traded and have a financial value. They are created under a legal framework for emissions trading such as the Kyoto Protocol or the EU ETS or generated by voluntary action outside of legal frameworks such as credits traded on the Chicago Climate Exchange.

**Carbon Finance**
Explores the financial risks and opportunities associated with a carbon-constrained society and anticipates the availability and use of market-based instruments that are capable of transferring environmental risk and achieving environmental objectives.

**Carbon Footprint**
A representation of the amount of CO₂ emitted through the combustion of fossil fuels. It is generally referred to as a measure of the amount of carbon emitted; in the case of a business, as part of their everyday operations; in the case of an individual or household, as part of their daily lives; or a product or commodity in reaching market.

**Carbon Management**
Refers to a company’s evaluation of emissions across the value chain, an understanding of the risks and opportunities associated with carbon constraints, the establishment of priorities for action and communication of these results to stakeholders.

**Carbon Neutral**
Emissions of carbon dioxide and/or other GHGs into the atmosphere from the manufacture of a product, a company or another activity have been offset by removing an equal amount of gas from the atmosphere.

**Carbon Pricing**
Refers to the action of putting a price on a ton of carbon. There are several possibilities to establish a carbon price. Options include the adoption of a carbon tax or cap-and-trade scheme.

**Carbon Sequestration**
The uptake of CO₂ and storage of carbon in biological sinks.

**Certified Emission Reduction (CER)**
A certified reduction in GHG emissions resulting from a CDM project. One unit under the Kyoto Protocol equals one metric ton of CO₂e. CERs are tradable commodities that can be used by Annex 1 countries to meet their commitments under the Kyoto Protocol.
### CLEAN DEVELOPMENT MECHANISM (CDM)
A mechanism established by Article 12 of the Kyoto Protocol for project-based emission reduction activities in developing countries. The CDM is designed to meet two main objectives: to address the sustainability needs of the host country and to increase the opportunities available to Annex 1 Parties to meet their GHG reduction commitments. The CDM allows for the creation, acquisition and transfer of CERs from climate change mitigation projects undertaken in non-Annex 1 countries.

### CLIMATE
The average weather experienced over a long period, typically 30 years including temperature, wind and rainfall patterns.

### CLIMATE ADAPTATION
The process or outcome of a process that leads to a reduction in harm or risk of harm, or realization of benefits, associated with climate variability and climate change.

### CONSOLIDATION
Combination of GHG emissions data from separate operations that form part of one company or group of companies.

### CO₂ CONCENTRATION
The amount of CO₂ in the atmosphere at any given time, typically measured in parts per million (ppm).

### CO₂-EQUIVALENT (CO₂E)
The universal unit of measurement to indicate the global warming potential (GWP) of each of the six GHGs, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different GHGs against a common basis.

### CDM GOLD STANDARD
A NGO-backed standard for offset projects which goes beyond the standard requirements required by the Kyoto Protocol. Its aim is to cover the top 20% of the market, certifying projects that contribute to emissions reductions and meet stringent sustainable development requirements.

### DECARBONIZATION
The action of reducing the carbon content required (carbon intensity) to produce a product or service.

### DIRECT GHG EMISSIONS
Emissions from sources that are owned or controlled by the reporting company.

### DOUBLE COUNTING
Two or more reporting companies take ownership of the same emissions or reductions.

### EMISSION FACTOR
A factor allowing GHG emissions to be estimated from a unit of available activity data (i.e., tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions.

### ENERGY INTENSITY
The level of energy input per unit of output.

### FUGITIVE EMISSIONS
Emissions that are not physically controlled by result from the intentional or unintentional releases of GHGs. They commonly arise from the production, processing transmission storage and use of fuels and other chemicals, often through joints, seals, packing, gaskets etc.

### GREENHOUSE GASES (GHGs)
A number of anthropologically produced and naturally occurring gases whose presence in the atmosphere traps energy radiated by the Earth. Primary GHGs, aside from water vapor include the following six gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

### GHG CAPTURE
Collection of GHG emissions from a GHG source for storage in a sink.

### GHG CREDIT
GHG offsets can be converted into GHG credits when used to meet an externally imposed target. A GHG credit is a convertible and transferable instrument usually bestowed by a GHG program.

### GHG INTENSITY OF ENERGY
The quantity of GHG produced relative to total energy output.

### GHG MARKET
A GHG market is similar to a stock market however in the GHG market, GHG allowances or certificates are traded instead of stocks. GHG markets are designed to offer flexibility to market participants in meeting mandatory/voluntary targets and to help identify cost-effective GHG emission reduction opportunities.

### GHG OFFSET
Offsets are discrete GHG reductions used to compensate for (i.e. offset) GHG emissions elsewhere. Offsets are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the mitigation project that generates the offsets. To avoid double counting, the reduction giving rise to the offset must occur at sources or sinks not included in the target or cap for which it is used.

### GHG PROGRAM
A generic term used to refer to any voluntary or mandatory international, national, sub-national, government or non-governmental authority that registers, certifies or regulates GHG emissions or removals outside the company including the Clean Development Mechanism (CDM), the European Union Emissions Allowance Trading Scheme (EU ETS) and the Chicago Climate Exchange (CCX).

### GHG PROJECT
A specific project or activity designed to achieve GHG emissions reductions, storage of carbon, or enhancement of GHG removals from the atmosphere. GHG projects may be stand-alone projects or specific activities or elements within a larger non-GHG related project.

### GHG PROTOCOL INITIATIVE

### GHG PROTOCOL PROJECT QUANTIFICATION STANDARD
An additional module of the GHG Protocol Initiative addressing the quantification of GHG reduction projects. This includes projects that will be used to offset emissions elsewhere and/or generate credits.
GLOSSARY OF TERMS

GHG REGISTRY
A public database of organizational GHG emissions and/or project reductions such as the California Climate Action Registry (CCAR) and the World Economic Forum’s Global GHG Register. Each registry has its own rules regarding what and how information is reported.

GHG REMOVAL
Absorption or sequestration of GHGs from the atmosphere.

GHG SINK
Any physical unit or process that stores GHGs; usually refers to forests and underground/deep sea reservoirs of CO₂.

GHG SOURCE
Any physical unit or process which releases GHG into the atmosphere.

GLOBAL WARMING POTENTIAL (GWP)
A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO₂.

INDIRECT EMISSIONS
Emissions that are a consequence of the operations of the reporting company but occur from sources owned or controlled by another company (i.e. as a consequence of the import of electricity, heat or steam).

INTENSITY RATIOS
Ratios that express GHG impact per unit of physical activity or unit of economic value (tonnes of CO₂ emissions per electricity generated). Intensity ratios are the inverse of productivity/efficiency ratios.

INTENSITY TARGET
A target defined by reduction in the ratio of emissions and a business metric over time (i.e. reduce CO₂ per tonne of cement by 12% between 2000 and 2008).

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)
Established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess the scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation.

INVENTORY
A quantified list of an organization’s GHG emissions and sources.

INVENTORY BOUNDARY
A line that encompasses the direct and indirect emissions included in the inventory that result from the chosen organizational and operational boundaries.

ISO 14064
A global standard for dealing with voluntary emissions reduction credits. Includes requirements for quantifying and verifying both organizational GHG emissions and emission reductions at a project level.

JOINT IMPLEMENTATION (JI)
The JI mechanism was established in Article 6 of the Kyoto Protocol and refers to climate change mitigation projects implemented between two Annex 1 countries. JI allows for the creation, acquisition and transfer of emission reduction units.

LIFE-CYCLE ANALYSIS
Assessment of the sum of a product’s effects (i.e. GHG emissions) at each step in its life cycle including resource extraction, production, use phase and waste disposal.

MARKET INSTRUMENTS
Carbon taxes, carbon trading and subsidies and tax breaks for low-carbon technologies that aim to enhance the competitiveness of low-carbon technologies.

MATERIALITY THRESHOLD
A concept employed in the process of verification. It is often used to determine whether an error or omission is a material discrepancy or not.

NON-ANNEX 1 COUNTRIES
Countries that have ratified or acceded to the UNFCCC but are not listed under Annex 1 and are therefore not under any emission reduction obligation.

OFFSET
A specific activity or set of activities that reduce, remove or sequester GHG emissions from the atmosphere.

OPERATIONAL BOUNDARY
The boundary that determines the core and direct emissions and sources. The boundary allows a company to establish which operations and sources cause direct and indirect emissions and to decide which optional emissions to include that are a consequence of its operations.

ORGANIZATIONAL BOUNDARY
The boundary that determines the operations owned or controlled by the reporting company depending on the consolidation approach taken.

PRIMARY EFFECTS
The specific GHG reducing elements or activities (reducing GHG emissions, carbon storage or enhancing GHG removals) that the project is intended to achieve.

PRIMARY ENERGY
The total energy contained in a naturally occurring raw material such as coal, oil or natural gas or generated by any energy system before being converted into an end-use form.

PRODUCIVITY/EFFICIENCY RATIOS
Ratios that express the value or achievement of a business divided by its GHG impact. Increasing efficiency ratios reflect a positive performance improvement.

REFORESTATION
This process increases the capacity of the land to sequester carbon by replanting forest biomass in areas where forests have been previously harvested.

RENEWABLE ENERGY
Energy taken from sources that is inexhaustible including wind, water, solar, geothermal energy and biofuels.

REPORTING
Presenting data to internal management and external users such as regulators,
shareholders, the general public or specific stakeholder groups.

**RISK IDENTIFICATION**
The process by which hazards are recognized and characterized. In the case of climate change risk assessment, risk identification is a deliberate procedure to review and anticipate possible hazards. Risks associated with climate variability can in general be identified from past experience of climate.

**SCOPE**
Defines the operational boundaries in relation to indirect and direct GHG emissions.

**SCOPE 1 INVENTORY**
A reporting organization’s direct GHG emissions.

**SCOPE 2 INVENTORY**
A reporting organization’s emissions associated with the generation of electricity, heating/cooling or steam purchased for own consumption.

**SCOPE 3 INVENTORY**
A reporting organization’s indirect emissions other than those covered in scope 2.

**SECONDARY EFFECTS (LEAKAGE)**
GHG emissions changes resulting from the project not captured by the primary effect(s). These are typically the small, unintended GHG consequences of a project.

**SEQUESTRATION**
Refers to the capture of carbon dioxide in a manner that prevents it from being released into the atmosphere for a specified period of time.

**STABILIZATION WEDGE/SOCOLOW’S AND PACALA’S WEDGE**
A theory developed by Princeton professors, Rob Socolow and Stephen Pacala. To stabilize emissions in the next 50 years, the world must reduce emissions by about 7 gigatons of carbon (not CO₂) compared to “business as usual” scenarios. Socolow and Pacala identified 15 stabilization wedges that, if deployed at a significant global scale, could conceivably reduce emissions by 1 gigaton each. Some examples of the 15 proposed stabilization wedges include increased fuel economy for two billion cars from 30 to 60 mpg, reduced carbon emissions by 25% in buildings and appliances projected for 2054, add 100 times the current Brazil or US ethanol production with the use of 250 million hectares.

**STAKEHOLDER**
Individuals and organizations that have an investment, financial or otherwise, in the consequences of any decisions taken.

**TARGET BASE YEAR**
The base year used for defining a GHG target (i.e. to reduce CO₂ emissions 25% below the target base year levels specified by the target base year 2010).

**TARGET COMPLETION DATE**
The date that defines the end of the target commitment period and determines whether the target is relatively short-or long-term.

**UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)**
An international convention adopted on May 9, 1992 in New York and signed at the Earth Summit in Rio de Janeiro by more than 150 countries and the European community. Its objective is to stabilize GHG concentrations in the atmosphere to levels that would prevent dangerous anthropogenic interference with the climate system. The convention entered into force in March 1994.

**VALUE CHAIN EMISSIONS**
Emissions from the upstream and downstream activities associated with the operations of a reporting company.

**VERIFICATION**
An independent assessment of the reliability (considering completeness and accuracy) of a GHG inventory.

**VULNERABILITY**
The extent to which climate change may damage or harm a system. It depends not only on a system’s sensitivity but also on its ability to adapt to new climatic conditions.
REFERENCES


The experiences, voices and actions of leaders may be the most credible communicators to businesses not yet engaged. Communication that illustrates the hard facts (emissions, types of activities and costs savings) about what some companies have done will be persuasive to those not yet engaged.” 112

Vicky Arroyo and Benjamin Preston
REFERENCES


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Developing green minds. And giving young Canadians an early start in environmental thinking. It’s the reason Enbridge supports the Pembina Institute’s Greenlearning.ca Program.

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CBSR is integrating climate change perspectives into all of the practice areas above to help member companies understand the impacts of climate change on their CSR initiatives.

To learn more about Climate and CBSR’s Advisory Services, please contact Mel Phadtare, Senior Programs Manager at +1 604 323 2714 or Wesley Gee, CSR Advisor at +1 416 703 7435. Alternatively please go to: www.cbsr.ca.

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The Climate Change Guide is printed on Cover and Text Domtar Proterra Ice resulting in the following benefits:

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