Sustainability and Business

A Narrative and Annotated Bibliography

July 2009

Erwin A.J. Dreessen, Ph.D.

Sustainability and Business: A Narrative and Annotated Bibliography (July2009)

ERRATA

Apart from minor style changes and typographical errors, the following errors in Version 7 (July 2009) were corrected in Version 8 (February 2010):

p. 17: EU (European Union) was added to the list of Acronyms.

p. 27: The 3rd-last line should read: "The Figure notes that low-cost opportunities are geographically dispersed, meaning that the".

p. 43: The concluding sentence of the annotation of C.S.A. (1995) should read: "(More on ISO 14000 in section 2.4.3.2 below.)".

p. 62, note 24: The last sentence should read: "No sample bias would imply that some 2500 manufacturing firms with 50 or more employees firms were listed."

p. 66: **"Karlskrona, Sweden,"** should be added to the reference of Hallstedt (2008), also on p. 237.

p. 74: The last reference of section 2.4.4.3 should be to ***"The Gazette (Montreal)"***. Likewise on p. 263.

p. 86: The reference to Hargroves & Smith (2005) should end with: *"(Hargroves & Smith is annotated in section 7.2.1.)"*.

p. 92: The 2nd line of the annotation in section 3.9 should read: "Bell Canada and about a dozen other major companies in the sector. Direct emissions from ICT".

p. 102: The first line of note 46 should read: "The authors use a simplified form of Tobin's Q, defining it as the sum of the market".

p. 111: In the 4th line from the bottom, there should be no ' " ' after 'process.'

p. 135: the 4th line from the bottom should read: "*indexes and funds follows. Finally, we look at investment industry practices – the Principles of*".

p. 154: The reference should read:
Bauer, Rob, Nadja Guenster, Jeroen Derwall and Kees C.G. Koedijk, "The Economic Value of Corporate Eco-Efficiency," August 2006, 34 pp. Available at SSRN http://ssrn.com/abstract=675628
and also be relocated in Reference list A to p. 226.

p. 173: The correct reference is:
Alfred Rappaport, "The Economics of Short-Term Performance Obsession," *Financial Analysts Journal*, vol. 61 no. 3 (2005), pp. 65-79.
and likewise on p. 247.

p. 198: Note 112 should read: "Some indicators are being developed at the sector level: See section 3.7 on the food, beverage and consumer products sector, section 3.8.2 on the pulp and paper industry, section 3.8.3 on FPAC's work and section 3.17 on the steel industry.".

p. 207: The quote at the end of the page should read: "*"Longer-term implications for a more comprehensive and sustained greening of sectoral international institutions remains* [sic] *unclear."*".

p. 244: The entry for NRTEE (2009) should be:
National Round Table on the Environment and the Economy, Achieving 2050: A Carbon Pricing Policy for Canada (Advisory Note), 2009, 121 pp. [Sections 2.4.4n and 7.3.6n]

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Foreword

At the request of the Small Business Policy Branch as it was then called (now the Small Business and Tourism Branch of the Small Business and Marketplace Services Sector, Industry Canada) I have spent much of the time available since March 2006 informing myself about sustainability and what it means for business. My sincere thanks go to Nancy Graham, then Director of Policy and Liaison at the Branch, for having suggested this investigation as a project suitable for a partial return to work during my recovery from illness. I am also grateful to Denis Martel, Director - Research & Analysis at the Branch, for re-hiring me post-retirement as a 'casual employee' so that this project could be completed.

I thank my colleagues at the former interdepartmental Working Group on SMEs & Sustainability for much initial material and friendly personnel at the IC Library and Knowledge Centre who retrieved many references for me. I am grateful to Louise Gravel for her technical assistance.

An earlier version of this work was distributed in July 2008 and presented at two workshops for government officials on September 3, 2008. I am grateful for all comments received from participants in the workshops and from recipients of that and later drafts. I remain to blame, of course, for all remaining errors and omissions. All opinions expressed are my own and should not be understood as representing those of the Branch or of the Government of Canada. The work is "Reproduced with the permission of the Minister of Public Works and Government Services, 2009."

The current text aims to be up to date to October 1, 2008, though some later developments are at least referenced – a dozen have a 2009 date.

The Summary was intended for publication on a Branch web site. It largely merges, in a somewhat expanded form, the Introduction and Epilogue of the present document. The full document text and related Figures are available at http://web.ncf.ca/ct976/ .

Feedback on the document or inquiries about works cited are welcome. Please contact me at < erwin [underscore] dreessen [at] ncf [dot] ca > or (613) 739-0727, fax (613) 739-1197.

E.D.
30 July 2009

Summary

This document is intended for both the general reader in government and research economists or policy analysts anywhere. Awareness of the sustainability challenge and the related business opportunity is still low, though the recent confirmation of human-generated climate change has led to significant progress in both awareness and the determination to act. Within the federal government, the assertion-in-principle in the mid-1990s that sustainable development (SD) was a central policy tenet has resulted in few roots, let alone implementation, in departmental actions. For the general reader in government, therefore, the intent of this document is nothing more or less than to further raise awareness about the significance of a sustainability orientation for businesses.

At the same time, it is hoped that the document will prove useful for policy analysts and researchers in the field, as a reference and perhaps as a source of ideas or warnings about pitfalls in their own work.

Besides the obvious anchor in the business perspective, wherever possible the selection of references and the annotations seek out what pertains to small and medium-sized enterprises (SMEs). They always note the inclusion of Canadian data, if there are any. For descriptive reports, an idea is provided of what is covered, without summarizing the substantive content. For analytical reports, the aim was to capture the source of data, the methodology employed and the main results. In two dozen cases, the annotation ends with a Comment.

Overall, nearly 400 references are annotated, in addition to over 100 news reports and, excluding government sites, over 50 web sites. An overwhelming proportion of the references dates from the last few years.

Scope and main findings

The narrative begins by putting the sustainability challenge in a global context, primarily with the help of the 2005 United Nations (UN) Millennium Assessments reports and the United Kingdom's Stern Review. These studies make the link to business considerations very explicit, leaving no doubt that environmental degradation and climate change pose both risks and opportunities for businesses. The rest of Section 1 annotates the UN's Global Compact initiative (launched in 2002) to engage business leaders on Human Rights, Labour Practices, the Environment and the fight against Corruption; and notes a number of business voices in Canada and abroad that advocate change. The Section concludes with a thought-provoking 2007 report by SustainAbility Ltd. It portrays the sustainability issue as the value creator/destroyer of the 21st century and sketches out four scenarios over the next 20 years in which either the environment, or society, or both, win or lose.

- By the best evidence, climate change is only part of a more widespread degradation of the planet's ecosystems on which all life – and business! – depends. Mitigation opens manifold opportunities for new businesses to spring up.

A Sidebar following Section 1 briefly deals with definitions. The "triple bottom line" (Environmental, Social, Economic) is recognized as the standard concept today, though the "ESG" acronym (for Environmental, Social and Governance issues, factors or risk exposures) is also prevalent, especially in financial circles.

Sections 2 and 3 deal with what a change to more sustainable conduct entails. Section 2 first reviews general frameworks and guidebooks. Special attention is paid to the work of Lynn Johannson for both Canadian and international audiences, because it is the best guide found that is expressly applicable to small and very small businesses. A dozen other general guides are also annotated. Then follow five special topics including annotations on eco-efficiency, standards and environmental management systems (EMSs), and carbon pricing.

- Triple-bottom-line thinking, and adoption of some form of EMS, is applicable to all manner and every size of business. Studies based on a large Organisation for Economic Co-operation and Development (OECD) survey suggest that formal EMSs become more attractive the larger the firm, if the firm is profitable, and if there is effective regulation.

- Whether through cap-in-trade or as a carbon tax, or both, carbon emissions will soon carry a price.

Section 3 references initiatives, progress reports, tools etc. in 20 industry sectors, starting with Canada's own Responsible Care® program in the chemical industry.

- In many instances, in sector initiatives as well as more broadly, an elite group of very large corporations is the most advanced in integrating triple-bottom-line thinking into its decision making. This will affect smaller firms if they are part of the supply chain to these large firms.

A brief Section 4 reviews the business case for more sustainable behaviour, interpreted as responding to the question whether such change is profitable. Surprisingly few studies were found that offer a rigorous answer to the question, though a majority do conclude that it pays to be green or sustainable. There are also annotations on ways of making the business case.

- The resource theory of the firm appears best placed to identify winners and losers. Essentially however, the case that it pays to be 'green' has long been proven and perhaps it's time to move on to developing solid metrics for corporate applications of sustainability initiatives.

Section 5 references the literature on Corporate Social Responsibility (CSR), highlighting the international CSR Implementation Guide – slightly modified from the Canadian original. A separate section is devoted to what drives firms to disclose sustainability-related information and what the uptake is in Canada and worldwide. The main drivers for reporting appear to be regulation, risk management or reduction, employee motivation, the rise of ethical consumerism, brand reputation management, and pressure from the Responsible Investment community. By last count, about 100 firms in Canada produced sustainability reports.

The Section concludes with brief annotations on the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP), and various scorecards and awards. The GRI has formulated the gold standard of sustainability reporting practices; some 1000 corporations around the world adhere fully to the GRI guidelines while many more seek inspiration in it. The CDP surveys the 2400 largest corporations in the world on volumes and management of their greenhouse gas emissions.

- While the practice is spreading, triple-bottom-line reporting is still long from being mainstream, especially in North America.

- There is a close correlation between good reporting and good ESG performance.

Section 6 asks whether the stock market rewards sustainable behaviour. First is a discussion of the legal requirement to disclose material facts and the interpretation of fiduciary duty. It would seem that corporations probably should disclose more than they do, and that investment advisors must at least consider such 'non-financial' information. A Sidebar offers an overview of efforts made to supply investors with sustainability-relevant information. Then follows, under three headings, a review of a selection of 15 studies that have examined the relationship between some measure of sustainable behaviour and stock prices: simulations, backcasting studies, and economic models. With one exception, each study in its own way points to the positive relationship between sustainability performance and stock market returns. The same strong trend is evident in several review studies, which are annotated next. Brief references follow to sustainability-sensitive investment vehicles currently on the market.

- It would appear that there <u>is</u> a sustainability premium. Companies that score well on ESG factors produce higher Total Returns, even in the current downturn.

Section 6 ends with a review of financial industry practices. Here are highlighted, first, the UN-sponsored Principles for Responsible Investment, which aim to mainstream the integration of ESG issues into investment decision making. Next we look at policies on Responsible Investment by the Canada Pension Plan Investment Board and other pension funds. Responsible Investment practices have evolved from negative screening to selection of best-in-class to constructive engagement with individual firms. In the financial industry as a whole, consideration of ESG factors is increasing but is not yet a mainstream practice. In fact, short-termism seems to have gained more ground recently.

- In line with the research results found earlier, the financial industry is gradually recognizing that favouring corporations that perform well on ESG criteria also helps improve financial performance.

- Short-termism, and the obsession with quarterly earnings, is – well beyond the realm of sustainable-sensitive investing – an ailment that is not in the best interest of most stakeholders.

The narrative and annotations in the final Section, on the role of governments, stay purposely short of surveying current or recent government policies. Instead, the Section begins with calls for 'new thinking' in response to the sustainability imperative, emanating from work in both Canada and Australia. The Section situates Canada's 1995 amendment to the *Auditor General Act* that created the Commissioner of the Environment and Sustainable Development as an early manifestation of the central importance of the SD perspective – an initiative now complemented by the *Federal Sustainable Development Act (2008).*

Literature pertaining to seven policy domains are annotated next, starting with, again out of Australia, an analysis of what works and what doesn't in environmental regulation of SMEs. The history of 'ecological' fiscal policy advice in the 1990s in Canada is documented. Two reports compile what governments around the world are doing about Sustainable Consumption.

- Governments are indispensable partners if businesses are to succeed in becoming more sustainable.

- Government leadership is particularly indicated regarding policies on Sustainable Consumption and Production.

Significant attention is paid to the thriving field of indicators – both principles and theories, and what actual indicators are available. The now largely archived "National Environmental Indicator Series 2003" by Environment Canada is documented. Apart from an abortive attempt by the National Round Table on the Environment and the Economy in 1997-99 to measure eco-efficiency, there are no SD indicators that specifically track business sector performance. Brief reviews of studies about governance and of commentary on energy policy conclude the list of specific topics.

- The OECD's Key Environmental Indicators are impressive in combining fact with measuring issues, policy challenges, trends, etc.

Finally, advice from very diverse quarters is presented on what governments could do better to help businesses, and especially SMEs, engage in better environmental practices. For example, from the European Union comes a report that identifies best practices to encourage SMEs to adopt an environmental management system.

More generally, the role of governments in helping businesses to become more sustainable may be categorized as follows:

1- establish framework conditions through laws, regulations and creation of institutions;
2- adopt policies, including fiscal policies and adoption of international treaties;
3- provide incentives or subsidies;
4- provide information (including technical assistance) and support information networks and partnerships;
5- support research and research networks; and
6- support pre-commercial pilot projects.

What could follow

The Narrative aims to increase awareness of the significance of more sustainable conduct on the part of businesses of all sizes. It is hoped that it will lead to governments placing higher priority on facilitating businesses' transition to greater sustainability.

Researchers and policy analysts – the other audience for which especially these Annotations are intended – hopefully will make a few discoveries, gain some insights and receive guidance for their own work.

Future SME-related research could usefully examine the relevance and feasibility of high-quality industry-specific standards such as in chemicals and mining – standards that are binding on the majors – for the several thousand smaller firms that populate these industries but are not members of the association of majors.

There also is a dearth of carefully constructed backcasting studies of Responsible Investment performance that are transparently reported.

Finally, the employment implications of a 'green' economy appear to be severely under-researched.

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Outline

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Detailed Table of Contents

List of Figures

(The Figures are inserted at the end of the document.
The page number below indicate the location of placeholders.)

* Bibliography only

Introduction

Who may want to read this report?

This document is intended for both the general reader in government and the research economist or policy analyst anywhere. Awareness of the sustainability challenge and the related business opportunity is still low, though the recent confirmation of human-generated climate change has led to significant progress in both awareness and the determination to act. Within the federal government, the assertion-in-principle in the mid-1990s that sustainable development was a central policy tenet has resulted in few roots, let alone implementation, in departmental actions. For the general reader in government, therefore, the intent of this document is nothing more or less than to further raise awareness about the significance of a sustainability orientation for businesses.

At the same time, it is hoped that the document will prove useful for policy analysts and researchers in the field, as a reference and perhaps as a source of ideas or warnings about pitfalls in their own work.

What's the storyline?

The narrative begins by putting the sustainability challenge in a global context, primarily with the help of the 2005 UN Millennium Assessments reports and the UK's Stern Review. These studies make the link to business considerations very explicit. The rest of Section 1 annotates the UN's Global Compact initiative and a number business voices in Canada and abroad that advocate change. The Section concludes with a thought-provoking 2007 report by SustainAbility Ltd. A Sidebar following Section 1 briefly deals with Definitions. The "triple bottom line" (Environmental, Social, Economic) is recognized as the standard concept today, though the "ESG" acronym (for Environmental, Social and Governance issues, factors or risk exposures) is also prevalent, especially in financial circles.

Sections 2 and 3 deal with what a change to more sustainable conduct entails. Section 2 first reviews general frameworks and guidebooks. Special attention is paid to the work of Lynn Johannson for both Canadian and international audiences, because it is the best found that is expressly applicable to small and very small businesses. A dozen other general guides are also annotated. Then follow five special topics including annotations on eco-efficiency, standards and environmental management systems, and carbon pricing.

Section 3 references initiatives, progress reports, tools etc. in 20 industry sectors, starting with Canada's own Responsible Care® program in the chemical industry.

A brief Section 4 reviews the business case for more sustainable behaviour, interpreted as responding to the question whether such change is profitable. Surprisingly few studies are found that offer a rigorous answer to the question, though a majority do conclude that it pays to be green or sustainable. There are also annotations on ways of making the business case.

Section 5 references the literature on Corporate Social Responsibility (CSR), highlighting the international CSR Implementation Guide – slightly modified from the Canadian original. A separate section is devoted to what drives firms to disclose sustainability-related information and what the uptake is in Canada and world-wide. The Section concludes with brief annotations on the Global Reporting Initiative, the Carbon Disclosure Project, and various scorecards and awards.

Section 6 asks whether the stock market reward sustainable behaviour. First is a discussion of the legal requirement to disclose material facts and the interpretation of fiduciary duty. A Sidebar offers an overview of efforts made to supply investors with sustainability-relevant information. Then follows, under three headings, a review of 15 studies that have examined the relationship between some measure of sustainable behaviour and stock prices: simulations, backcasting studies, and economic models. Annotations of review studies follow. Next are brief references to sustainability-sensitive investment vehicles currently on the market.

Section 6 ends with a review of financial industry practices. Here are highlighted, first, the UN-sponsored Principles for Responsible Investment, followed by policies enunciated by pension funds – presumably prime candidates to adhere to the long term view – and venture capitalists. The final subsection contains annotations about "short-termism" – the tendency to let quarterly earnings overpower all other considerations when it comes to investing.

Lastly, Section 7, on the role of governments, begins with calls for 'new thinking' in response to the sustainability imperative. Literature pertaining to seven policy domains are annotated next, starting with an analysis of what works and what doesn't in environmental regulation of SMEs. The history of 'ecological' fiscal policy advice in the 1990s in Canada is documented. Two reports compile what governments around the world are doing about Sustainable Consumption. Significant attention is paid to the thriving field of Indicators – both principles and theories, and what actual indicators are available. Brief annotations on Governance and on Energy Policy conclude the Section.

Conclusions, lessons learned and a few suggestions for future work are set out in the Epilogue.

My lens

Besides the obvious anchor in the business perspective, wherever possible the selection of references and the annotations seek out what pertains to small and medium-sized enterprises. They always note the inclusion of Canadian data, if there are any. For descriptive reports, an idea is provided of what is covered, without summarizing the substantive content. For analytical

reports, the aim was to capture the source of data, the methodology employed, and the main results. In two dozen cases, the annotation ends with a *Comment.* Brief annotations under any given heading are in counter-chronological order.

Reading tips

Blocks of text in italics indicate narrative, while annotations are in normal type. All references in bold are collected at the end of the document. (The References list sometimes provides more information such as titles of news items.) In some contexts bolding is omitted when it would be superfluous or make for too much clutter. Smaller font signals references and annotations of secondary relevance but is also used for longer quotes or to make a quote stand out.

I would suggest that readers wishing to go beyond the Summary (or this Introduction and the Epilogue) glance or read through most of Section 1 (including Sidebar 1) and at least the Broad Strokes part of Section 7 (section 7.2). For the remaining sections, the general reader may want to focus on the italicized parts, selectively reading an annotation for which curiosity is tweaked. Sometimes words in an annotation are in bold, meant to draw the attention of the narrative-only reader.

Acronyms

In order to lighten up the text, many acronyms are defined and used within one paragraph or annotation and used there only. Besides UN, US and UK, acronyms more often used include:

CSR	:	Corporate Social Responsibility
EMS	:	Environmental Management System
ESG	:	Environmental, Social and Governance factors or issues
GRI	:	Global Reporting Initiative
IISD	:	International Institute for Sustainable Development
NRTEE	:	National Round Table on the Environment and the Economy
PRI	:	Principles for Responsible Investment
SD	:	Sustainable Development
SMEs	:	Small and Medium-sized Enterprises
SRI	:	Socially Responsible Investment
UNEP	:	UN Environmental Programme
WBCSD	:	World Business Council for Sustainable Development

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SECTION 1 Global Assessments and what they mean for Business

1.1 The UN Millennium Assessments and Follow-up

Several initiatives attempt to grasp the totality of the human race's challenge to the survival of the planet:

- *World Scientists' Warning to Humanity, 1992 (www.ucsusa.org)*
- *The Earth Charter Initiative (www.earthcharter.org)*
- *A Manifesto for Earth (www.ecospherics.net)*
- *The Ecological Footprint methodology (www.footprintnetwork.org)*
- *The Millennium Development Goals, 2000 (www.un.org/millenniumgoals/),*

and more. However, the UN's Millennium Assessment (MA) *reports, the result of the work of 2000 authors and reviewers worldwide, make an explicit, science-based link to Business. There are specific MA Synthesis reports (themed "Ecosystems and Human Well-Being") on Biodiversity, Desertification, Human Health, and Wetlands. The overall* Synthesis *report was published in 2005 by the World Resources Institute (WRI) as was another one that further homed in on the business implications of the findings:*

World Resources Institute (WRI), Synthesis, Millennium Ecosystem Assessment, 2005, 137 pp.
WRI, Opportunities & Challenges for Business & Industry, 2005, 32 pp.

Both reports can be downloaded from www.millenniumassessment.org.([1]) They provide considerable detail on the scientific basis of the MA's findings. The MA's model identifies **four Ecosystem Services**: Provisioning, Regulating, Cultural, and Supporting; and Direct and Indirect drivers of change. **Five Direct Drivers** are: Habitat change, Climate change, Invasive species, Overexploitation (especially fishing), and Pollution (especially nitrogen and phosphorus). The impact of these drivers over the last century on 13 ecosystems (four types

[1] The Millennium Reports are also available in the web-based *Encyclopedia of Earth.*

of Forest, three types of Dryland, Inland water, Coastal water, Marine life, Islands, Mountains and Polar areas) is then assessed as ranging from Low to Very High. A trend, from Decreasing to Very Rapid Increase, is also identified.

Figure 1 displays a 65-cell grid of impacts. Nine impacts are rated Very High, 12 others High; and 34 trends show Very Rapid Increase of the impact.

Figure 1: Main Direct Drivers of Change in Biodiversity and Ecosystems

See also:

World Business Council for Sustainable Development (WBCSD), WRI and others, Business and Ecosystems : Ecosystem Challenges and Business Implications, November 2006, 20 pp.

(Download from www.wbcsd.org .) Drawing on the 2005 Millennium Assessment reports, this publication succinctly characterizes **six challenges**: water scarcity, climate change, habitat change, biodiversity loss & invasive species, overexploitation of oceans, and nutrient overloading – closely modelled on the five Direct Drivers in the Synthesis report. It then outlines **risks and opportunities** for each; as well there are, for each, one or two graphics, a box describing some concrete action a corporation is taking, and a few quotes from business persons. This is an easier read and has a somewhat different take than what is found in the original MA Synthesis Reports.

And:

Millennium Ecosystem Assessment, Business Industry Sector Perspectives on the Findings of the Millennium Ecosystem Assessment (21 pp., 2005),

Provides comments and case examples from Agri-business, Coffee Supply Chains, Mining, Oil & Gas, Energy & Utilities, Forestry and Tourism in Costa Rica.

In 2008, as a follow-up to the Millennium Assessments, the WRI published:

WRI, WBCSD and Meridian Institute, The Corporate Ecosystem Services Review – Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change - Version 1.0, March 2008, 40 pp.

From the Foreword: "Global warming may dominate headlines today. Ecosystem degradation will do so tomorrow." The publication offers corporate managers "an approach to making the connection between ecosystem change and their business goals." The tools and ideas offered were 'road-tested' by five companies, including BC Hydro. They are intended to be applicable to companies in a wide range of sectors.

A 5-step process is set out, identifying who should be involved and the sources of information. Both risks and opportunities are noted throughout. A Dependence and Impact Assessment Tool is offered – a spreadsheet to accommodate information on each of 23 ecosystem services; it produces a 1-page visual summary at the end. The Tool, the paper, and much other information and assistance are available from www.wri.org/ecosystems/esr.

Comment: This tool looks well-designed and deserves to be further looked into for wider application.

Note: EXCEL is a group of 14 Canadian corporations formed in 1996 and is the WBCSD's Canadian affiliate. Its members are "committed to integrating environmental, economical and social performance with [their] business strategy." EXCEL is an initiative of the Globe Foundation and is managed by the Delphi Group. (Ref.: **www.excelpartnertship.ca**.)

1.2 "One Planet Business"

In 2006, the World Wildlife Fund and UK-based international consulting firm SustainAbility Ltd. initiated a research project under the name "One Planet Business."

World Wildlife Fund and SustainAbility, <u>One Planet Business – Creating Value Within Planetary Limits</u>, 2007 First Edition, 52 pp.
World Wildlife Fund, <u>Methodology for determining global sectoral material consumption, carbon dioxide emissions and Ecological Footprints</u>, 9 June 2006, Review Version 12, 65 pp.

The project aims to translate the finite limits of our one planet into a framework to enable engagement by the business community. It sees the key implications of the "overshoot" to include increased resource prices, supply disruptions and growing regulatory pressure. At the same time the report sees huge business opportunities to meet demand and create value.

In a first phase, making use of an environmental extension of input-output analysis, the project has measured the degree of "overshoot," currently estimated to be 25% globally. Next it will measure the impact of demand areas, sector and supply chains, and individual companies. It will focus on three areas of demand: housing, transport and food, noting that these three areas together account for 63% of mankind's ecological footprint, 65% of total CO_2 emissions and 72% of the world's material use. It has begun to tackle an analysis of Personal Mobility.

1.3 Climate Change

Increasingly, climate change *is becoming the angle through which the sustainability challenge is gaining popular and political traction. Along with the Reports from the* **Intergovernmental Panel on Climate Change** *(ref.* **www.ipcc.ch***), one of the most influential recent publications, synthesizing much previous research, is the report by* Nicholas Stern *for the UK government, issued late 2006:*

Nicholas Stern, The Economics of Climate Change (The Stern Review), U.K. Cabinet office - HM Treasury, ISBN-13: 9780521700801, available at http://www.occ.gov.uk/activities/stern.htm . Issued late 2006, presented in Toronto, 19 February 2007. Articles by Don Butler in *The Ottawa Citizen*, 18 February; an op-ed article by Sir Stern in the *Globe & Mail*, 19 February 2007; an article by Martin Mittelstaedt, *Globe & Mail*, 20 February 2007. All quotes below are from the "long," 27-page **Executive Summary** of the Report; there is also a 4-page **"short" Executive Summary**.

Figure 2, from the Stern report, illustrates the ranges of CO_{2e} concentration, associated ranges of temperature change, and the impact on food, water, ecosystems, etc.([2])

Figure 2: Impact of increasing greenhouse gases

Stern describes climate change as "the greatest and widest-ranging market failure ever seen." (p. 1) This necessitates global analysis, long time horizons, giving centre stage to the economics of risk and uncertainty, and allowing for the possibility of major, non-marginal change.

> No-one can predict the consequences of climate change with complete certainty; but we now know enough to understand the risks. Mitigation - taking strong action to reduce emissions - must be viewed as an investment, a cost incurred now and in the coming few decades to avoid the risks of very severe consequences in the future. If these investments are made wisely, the costs will be manageable, and there will be a wide range of opportunities for growth and development along the way. For this to work well, policy must promote sound market signals, overcome market failures and have equity and risk mitigation at its core. That essentially is the conceptual framework of this Review. (p. 1)

Using a range of methods to analyze costs and benefits, he comes to "a simple conclusion: the benefits of strong, early action considerably outweigh the costs" (p. 2).
He notes that "Uncertainty is an argument for a more, not less demanding goal, because of the size of the adverse climate-change impacts in the worst-case scenarios" (p. 17).

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[2] This figure is also reproduced in Sir Stern's 2008 AEA Lecture.

There are evident implications for business. A few salient findings:

- "A 5 or 10% increase in hurricane wind speed, linked to rising sea temperatures, is predicted approximately to double annual damage costs, in the USA." (p. 8)

- under a Business as Usual (BAU) scenario, "analyses that take into account the full ranges of both impacts and possible outcomes - that is, that employ the basic economics of risk - suggest that BAU climate change will reduce welfare by an amount equivalent to a reduction in consumption per head of between 5 and 20%. Taking account of the increasing scientific evidence of greater risks, of aversion to the possibilities of catastrophe, and of a broader approach to the consequences than implied by narrow output measures, the appropriate estimate is likely to be in the upper part of this range." (p. 10)

- "With strong, deliberate policy choices, it is possible to 'decarbonise' both developed and developing economies on the scale required for climate stabilisation, while maintaining economic growth in both." (p. 11)

- based on both resource cost estimates and macroeconomic models, the "central estimate is that stabilisation of greenhouse gases at levels of 500-550ppm CO2e will cost, on average, around 1% of annual global GDP by 2050. This is significant, but is fully consistent with continued growth and development, in contrast with unabated climate change, which will eventually pose significant threats to growth." (p. 13)

- "Preliminary calculations ... suggest that the social cost of carbon today, if we remain on a BAU trajectory, is of the order of $85 per tonne of CO2 ...This number is well above marginal abatement costs in many sectors. Comparing the social costs of carbon on a BAU trajectory and on a path towards stabilisation at 550ppm CO2e, we estimate the excess of benefits over costs, in net present value terms, from implementing strong mitigation policies this year, shifting the world onto the better path: the net benefits would be of the order of $2.5 trillion. This figure will increase over time. This is not an estimate of net benefits occurring in this year, but a measure of the benefits that could flow from actions taken this year; many of the costs and benefits would be in the medium to long term." (p. 16-17)

The Review identifies three essential elements of an emissions reduction policy: (1) establish a price for carbon, whether through taxes, trading or regulation; (2) support the development of low-carbon high-efficiency technologies; (3) remove barriers to behavioural change to encourage the take-up opportunities for energy efficiency.

Journal articles critically reviewing the Stern Review include:

William D. Nordhaus, "A Review of the *Stern Review on the Economics of Climate Change*," *Journal of Economic Literature*, vol. XLV (September 2007), pp. 686-702.

Martin L. Weitzman, "A Review of the *Stern Review on the Economics of Climate Change*," *Journal of Economic Literature*, vol. XLV (September 2007), pp. 703-724.

And Stern answers his critics in an undated Postscript *to his report, with a* Technical Annex to Postscript *(8 and 13 pp. respectively; both are available along with the report on the UK Government web site), and in his Richard T. Ely Lecture at the January 2008 American Economic Association meeting in New Orleans:*

Nicholas Stern, "The Economics of Climate Change," *American Economic Review: Papers and Proceedings 2008*, vol. 98, no. 2 (May 2008), pp. 1-37.

The main (related) objections raised to Stern's analysis concern whether there is a need for immediate, decisive action and whether the proper discount rate was used. In his responses Stern makes a strong argument for urgent action – one being that stocks of greenhouse gases are extremely difficult to reduce. His expansion on the reason for a (very low) discount rate illuminates that it is at bottom an ethical choice and should not be confused with, e.g., discount rates used for project evaluation. He notes that, if the 'probability of existence' view of pure discounting is invoked, then the pure time discount rate used in his analysis (0.1%) implies a probability of 91% that the human race will survive the next 100 years. If one believes that probability to be higher then even lower discount rates should be used.

Stern posits that the methods to combat and mitigate climate change must be effective, efficient and equitable. In his lecture, he sets out elements of a Global Deal that would meet these criteria.([3])

Kenneth J. Arrow, "Global Climate Change: A Challenge to Policy," *Economists' Voice*, June 2007, The Berkeley Electronic Press, 5 pp.

Has a different take on the discount and preference parameters underlying Stern's calculations but finds that "even with higher discounting, the Stern Review's estimates of future benefits and costs imply that current mitigation passes a benefit-cost test" (p. 5).

Two other, even more recent reports grapple with the planetary challenge but they fail to draw out detailed implications for business. ([4])

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[3] In **Key Elements of a Global Deal on Climate Change, London School of Economics and Political Science, 2008, 56 pp.**, Stern also elaborates on the need for action by putting forward a set of proposals on emission targets, cap-and-trade, deforestation, technology, institutions, adaptation and the role of developing countries.

[4] *I refer to:*

- **UN Environment Programme, Global Environment Outlook: Environment for Development (GEO4), 25 October 2007.** *The report has 570 pages (22MB) but there are various, more digestible summaries.*
- **Intergovernmental Panel on Climate Change, Fourth Report (released 17 November 2007), esp. Contribution of Working Group II to the Fourth Assessment Report - Summary for Policymakers, 22 pp.**

A 2008 KPMG report assessed the risks and degrees of preparedness at a sector level:

Barend van Bergen (lead author), Climate Changes Your Business, KPMG International, Global Sustainability Services, 2008, 86 pp.

Based on a review of 50 reports and interviews with 11 external experts, the report distinguishes four types of risks: regulatory, physical, reputational and litigation. Plotted against preparedness for the effects of climate change, the report finds that six sectors are in the danger zone: oil & gas, aviation, health care, the financial sector, tourism, and transport. Three sectors are in 'safe haven:' telecommunications, chemicals, and food & beverages. Nine other sectors fall in between.

Looking ahead, the report suggests that companies invest in understanding and managing risks, seize opportunities and increase disclosure.

Here are two publications from government-owned Swedish energy giant Vattenfall:

Vattenfall, Curbing Climate Change - An outline of a framework leading to a low carbon emitting society, Stockholm, January 2006, 80 pp.

Vattenfall, Climate Map 2030, 2007, 28 pp.

The Outline is of an allocation model of burden sharing to stabilize CO_{2e} emissions, based on GDP/capita but with adjustments to limit negative economic effects and account for countries in different phases of industrialization. The application model is applied to two scenarios, one where global emissions peak around 2025, the other where they continue to increase another 15 years. The scenarios are run out to 2100.

The report criticizes the European Emissions Trading Scheme for being too short-sighted, limited to EU countries and covering less than 50% of the EU's CO_2 emissions.

The Climate Map outlines how emissions could be cut in the power industry, other industries, transport, buildings, forestry and agriculture & waste sectors. The weighted average abatement cost is estimated to be about €2 per tonne CO_{2e}. The abatement cost varies greatly by sector. E.g., for buildings, the marginal cost is negative €93/tonne (i.e., energy efficiency measures are profitable); in transport it is negative €9/tonne.

Figure 3, from the Climate Map, shows, along the vertical axis, the marginal cost of abatement, in euros per tonne of CO_{2e}. Along the horizontal axis is the abatement potential over the years to 2030, in Gt of CO_{2e}. The yellow area shows the many opportunities where money could be saved.

Figure 3: Marginal cost of abatement of greenhouse gas emissions

The report finds that, between now and 2030, about 5 billion tons of CO_{2e} per year could be abated with negative cost (i.e., save cost) and that, if carbon were priced at $40/ton, another 22 billion tons could be abated.([5])

Finally, a new group of business leaders going by the name of "3C" *(for* "Combat Climate Change"*), was launched in January 2007 and proposed a 'roadmap' on climate change:*

Combat Climate Change (3C), A roadmap to combating climate change, November 2007, 32 pp.

3C comprises the leaders of 46 large companies from 11 of the G8+5 countries. (BC Hydro is the only Canadian member.) The analysis of the paper draws on the Stern report, on the IPCC's latest report and on the Vattenfall work.

The roadmap identifies the key policies that are required to get us there: A long-term stable international emissions market for power and industry, minimum efficiency requirements for buildings and transportation, policies to halt deforestation and support low-carbon agriculture, and mechanisms to drive selected key technologies down the learning curve. It calls on the G8+5 countries to provide leadership.

Figure 4, taken from the report, shows the total abatement potential by region and sector. Note that low-cost opportunities are geographically dispersed, meaning that the more inclusive a compact to abate climate change, the closer the world will be to an optimal, most efficient path of abatement.

Figure 4: Abatement potential by industrial sector and region

[5] Another version of this Figure may also be found in Sir Stern's 2008 AEA Lecture.

1.4 Global Compact

With the Global Compact *(GC, ref.:* **www.unglobalcompact.org***) the UN's Secretary-general aims to engage business leaders on Human Rights, Labour Practices, the Environment and the fight against Corruption. Launched in July 2000, the Compact has adopted ten principles against which participants seek to measure themselves. A Leaders Summit was held in Geneva in July 2007, when the Compact could boast over 3,000 companies and almost 1,000 other stakeholders in 116 countries. The Summit saw the release of the GC's first* Annual Review*:*

UN Global Compact, Annual Review, June 2007, 62 pp.

The Review is based largely on data obtained from 400 participant companies who responded to a survey (15% response rate). Only 7% of the firms were from North-America; 59% were from Europe. Thirty-two percent were firms with fewer than 250 employees; 41% had between 250 and 10,000 employees; the remaining 28% employed more than 10,000.

The results show that setting environmental performance targets, formulating sustainable production objectives or having in place measurement and tracking systems, is practiced by most of the very large firms (about 79, 53 and 72 % for these three indicators respectively) but far less by the "smaller" firms. Noteworthy is also that, on average, only 40% said that their environmental policies applied to production sites the firm owned or over which they had significant control (62% for the largest firms, 35% for the middle group and 21% for firms with fewer than 250 employees).

For each of the elements of the ten principles (Human Rights, etc.) the Review lists a number of resources and tools. Under Anti-Corruption, note is made of the **Anti-Corruption Web Portal for SMEs, www.business-anti-corruption.com** , launched in 2006 by the Danish government with input from the GC and Transparency International. (TI is chaired by Huguette Labelle.)

See also:

McKinsey&Company, Shaping the New Rules of Competition: UN Global Compact Participant Mirror, July 2007, 30 pp.

Reports on a survey of CEOs of GC participant companies – 391 respondents representing companies in Europe (230), the U.S. (14), Canada (3) and elsewhere. Fifty-two of these companies each generated $10 billion or more in annual revenue, 59 between $1 and 10 billion, and 280 less than $1 billion. There were follow-up in-depth interviews with top executives of 31 companies as well as 7 civil society organizations.

Finds that 71% of the largest firms believe that climate change is the most critical "**ESG**" (**environmental, social** and **governance**) issue to address for the future success of their business, while only 44% of the middle group and 31% of firms with revenue of less than $1 billion/year believe so.

Fifty-nine percent said that they are incorporating "much more" ESG issues into their firm's core strategy than five years ago; another 34% did so "somewhat more." Comparing what they should do with what the company

actually does, the greatest performance gap was "Embed these issues into global supply chain management," followed by "Fully embed these issues into strategy and operations of subsidiaries." The greatest barriers to implementation of an integrated and strategic company-wide approach to ESG issues were seen to be "Competing strategic priorities" (43%), "Complexity of implementing strategy across various business functions" (39%), "Lack of recognition from the financial markets" (25%), and "Differing definitions of [Corporate Social Responsibility] across regions and cultures" (22%).

The Summit showcased a number of initiatives:

- *"Caring for Climate: The Business Leadership Platform"*
- *the "Principles for Responsible Management Education"*
- *the "CEO Water Mandate"*
- *the "Principles for Responsible Investment" (PRI)*

More on PRI in Section 6.4.1 below, as well as, in Section 6.2.3, on a report by Goldman Sachs released in conjunction with the Summit.

The Caring for Climate *platform consists of a 1-page statement which includes an expectation from governments that they "urgent[ly] creat[e], in close consultation with the business community and civil society, ... comprehensive, long-term and effective and fiscal frameworks designed to make markets work for the climate, in particular policies and mechanisms intended to create a stable price for carbon." The Statement was widely subscribed by GC participants, including 53 SMEs, and further signatories are encouraged.*

This call is similar to that of the United States Climate Action Partnership (USCAP), *"an expanding alliance of major businesses and leading climate and environmental groups that have come together to call on the federal government to enact legislation requiring significant reductions of greenhouse gas emissions." (Ref.* www.us-cap.org .*) Its "call for swift action" was issued on* January 22, 2007*:*

USCAP, A Call for Action, 20 pp.

At time of issue, the Partnership counted ten major U.S. corporations and four leading NGOs. By July 2007, the membership had grown to 23 companies and six NGOs.

USCAP lays out "a blueprint for a mandatory economy-wide, market-driven approach to climate protection." It says legislative action is urgently needed, with mandatory short- and mid-term reductions. The "cornerstone" of its approach is a cap-and-trade program.

See also, from the **Tomorrow's Leaders** *group of the* **WBCSD**, *"From Challenge to Opportunity - The role of business in tomorrow's society" including "*A manifesto for tomorrow's global business,*" issued* **20 Feb 2007** *by eight Executives of major corporations.*

*And a month later, 65 institutional investors managing $4 trillion in assets issued a "*Climate Call to Action.*" "We need regulations to enable the markets to deploy capital and spur innovation," said the CEO of the U.S.'s largest pension fund. (Source:* ***Greenbiz.com*****, 19 March 2007.)**

Finally in the US, on April 19, 2007, the **National Commission on Energy Policy**, *a bipartisan group of 20 energy experts representing the ranks of industry, government, academia, labour, consumer and environmental protection,*

renewed its call for federal action in its **Energy Policy Recommendations to the President and the 110th Congress**. *This was an update of the group's December 2004 report,* **Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges**. *The new report sets out six components that should be included in any federal mandatory GHG program.*

In Canada, **Don Drummond et al.** *sounded a similar note in "Market-based Solutions to protect the Environment," (ref. www.td.com/economics , 7* **March 2007***). They urged "market-based policies that change the price structure of pollution" and concluded that "any delay or vagueness in policy announcements creates an economic cost in itself."*

On October 1, 2007, the **Canadian Council of Chief Executives'** *Task Force on Environmental Leadership issued an 11-page Policy Declaration,* **"Clean Growth - Building a Canadian Environmental Superpower."** *The paper made five propositions, including the formulation of a national plan and creation of price signals through either an emissions trading regime or revenue-neutral environmental taxation.*

In anticipation of the July 2008 G8 Summit in Hokkaido, Japan,, the **WBCSD and World Economic Forum** *issued* **CEO Climate Policy Recommendations to G8 Leaders (32 pp.)**, *endorsed by 95 of the world's largest corporations. The report was developed with the assistance of the Pew Center on Global Climate Change. The recommendations accept the conclusions of the IPCC's Fourth Assessment Report and of the Stern Review, concluding that "a responsible risk management approach to the issue requires political and business leaders to take action now."*

The Geneva Summit culminated in a 2-page Geneva Declaration. *A few noteworthy statements were made at the GC Summit:*

UN Secretary-general Ban Ki-moon:
- "Exploitative practices, corruption, income inequality and other barriers discourage innovation and entrepreneurship."

E. Neville Isdell, Chairman & CEO, The Coca-Cola Company:
- "Business must become agents of transformation. We have the resources. We have the talents. And let's be clear here, we have the self-interest."
- "Business has stepped up... with both promises and programs. But if we add up all the great progress to date... it's only a mildly encouraging start. It's time to scale up."
- "We will change the world. ... because we can... and because we must."

(As an antidote, one may wish to consider the troubles Coca-Cola India is in. See **Paul Hawken, Blessed Unrest [Viking, 342 pp., 2007]**, pp. 159-161.)

(Source: WBCSD, Speeches)

Canadian press coverage:

Carol Stephenson and Paul Beamish, "When it comes to doing good, we can do better," ***Globe & Mail*****, 4 June 2007, page B2 (Agenda / Corporate Responsibility).**

In advance of the Summit, notes that Alcan and Bombardier are the only Canadian companies that are both in the Fortune Global 500 and participants in the GC; lists the 11 Canadian Global 500 that are not. See also the comment by Bronwyn Best, executive director of TI Canada in:

Steven Edwards, "UN tells execs to fight corruption, go green," ***Ottawa Citizen*****, July 6, 2007, page E3.**

1.5 SustainAbility: "Raising Our Game"

Also in July 2007, SustainAbility Ltd., *on its 20th anniversary, published a paper as part of what it describes as its "defining project:*

SustainAbility Ltd., Raising Our Game - Can We Sustain Globalization?, 2007, London, U.K., 70 pp.

The paper argues that

> the sustainability agenda, particularly when boiled down into narrower concepts like corporate social responsibility, has yet to be seen for what it is: a label applied to a set of factors that will drive waves of creative destruction through the coming decades.

Also asserts that

> we are reaching the limits of what business can achieve voluntarily [and that] interactions between the complexities of globalization and the evolving sustainability agenda will define markets and politics in the 21st century.

It identifies four "drivers" and seven "attributes" of global changes over the next 20 years. It notes, for example, the different shape globalization is taking, with South-South trade currently rising by 11% per year, double the global rate. One attribute of change is "Growing divides" and a later chapter will identify ten such divides ("The Stakes Are Rising"). Another attribute points to Hawken's Blessed Unrest (subtitled "How the Largest Movement in the World Came into Being and Why No One Saw it Coming") and much stock is put later into Hawken's description of civil society as an emerging planetary immune system.

These trends are then presented in four scenarios named after the four suits in playing cards, where either the Environment or Society, or both, win, or lose. The "Hearts" scenario, where both society and the environment "win," pictures a global pandemic in the early years which shuts down global trade. But this drives positive responses and "over time virtuous spirals of improvement set in." In "Diamonds," where both the environment and society lose, "demographic trends and the spread of western lifestyles devastate ecosystems." Society is unable to respond effectively and "vicious spirals develop in politics, governance, economics, and technology."

The paper also contrasts "old" (current) rules with new rules. One old rule is "Sustainability is a gloss to be applied to innovation, if and when external pressures make this necessary." To this the authors advise: "Leapfrog" – pointing to, e.g., the Stern Review and the Millennium Development Goals as indicating market opportunities for the private sector. Another old rule is "The aim of corporate responsibility is to keep the company's nose clean, contain risk, and build relationships with key influencers in case things go wrong." Au

contraire, they advise: "Scale solutions" – and "encourage public policy-makers to create the system conditions within which sustainable outcomes are very much more likely." Indeed, their final new rule is "Lobby – for sustainability," citing the example of USCAP.

The report concludes with what one may take to be a sustainability agenda for business:

> ...find ways to help business: avoid areas likely to descend into Diamonds-like chaos – and, where appropriate, to work on prevention; balance the different competing economic, social, and environmental priorities in the Clubs and Spades worlds; and evolve the breakthrough business models, technologies, and strategies needed to leapfrog the global economy towards more sustainable outcomes. (p. 62)

A graph at the end (pp.64-65) traces the "Upwaves and downwaves - Interest in sustainable development, 1967-2007."

This paper was launched in five cities around the world in May and June 2007. I found no coverage in the Canadian press.

So is the business world at the beginning of a new era? Worldwatch seems to think so. At the launch of the group's 25th State of the World report in January 2008, its president said: "There are signs that a vibrant sustainable economy is being created, the product of an extraordinary wave of innovation that is emerging in sectors like NGOs, consumer groups and governments and spreading to the business and finance worlds." And Daniel Esty, professor of environmental law and policy at Yale University, speaks in the report of "a sea change in business attitudes towards the environment over the last several years." (Source: **Karin Zeitvogel, *AFP*, 9 January 2008.***)*

Much of the remainder of this Narrative and Bibliography can be seen as investigating whether this is rhetoric or for real.

Sidebar 1 Defining Sustainable Development

The definition of Sustainable Development (SD) in the 1987 Brundtland Commission report refers to intergenerational responsibility for the planet:

United Nations, Our Common Future – Report of the World Commission on Environment and Development, December 1987.

> "Sustainable development [is] development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This definition continues to serve well.([6]) Note that equity is key – a component also strongly highlighted in SustainAbility's 2007 report. Various definitions of convenience float about (e.g., reducing its meaning to "a better quality of life"). In the literature, however, there now appears to be a consensus that SD refers to the ***"triple bottom line" – social, environmental and economic****. (SustanAbility Ltd. claims 1996 coining rights to this term.) This tripod is likely to endure. Perhaps only "deep ecology" supersedes it. Still, as seen, several variations are in vogue, also employing terms such as governance, ethics, corporate responsibility, and anti-corruption. In financial circles, "ESG" (for environmental, social and governance) issues, factors or risk exposures has more currency.*

Ann Dale offers an extensive discussion of concepts consistent with the triple bottom line concept.([7]) Her definition refers to the three imperatives, to each of which separate chapters are devoted:

> [Sustainable development is] a process involving the reconciliation of three imperatives: (1) the **ecological imperative** to live within global biophysical carrying capacity and to maintain biodiversity; (2) the **social imperative** to ensure the development of democratic systems of governance that can effectively propagate and sustain the values that people wish to live by; and (3) the **economic imperative** to ensure that basic needs are met worldwide. (p. 35)

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[6] *The 1995 amendment to the* Auditor General Act *that created the role of Commissioner of the Environment and Sustainable Development defines sustainable development literally as in the Brundtland report.*

[7] **Dale (2001:3-9)**, *further annotated in section 7.2.1. For a more recent discussion, see* **Blackburn (2007)**, *esp. pp. 1-10 and 18-20. A full annotation of Blackburn (2007) is in section 2.3.2. See also* **Bell and Morse (2008)**, *Chapter 1, esp. pp. 6-31. This work is annotated in section 7.3.5.1.*

While the Brundlandt Commission has popularized the term SD, the idea goes back much further. In 1915, Canada's Commission on Conservation said:

> Each generation is entitled to the interest on the natural capital, but the principal should be handed on unimpaired.

(For more on this remarkable Commission, see an article by **David Wood, "Picturing Conservation in Canada: The Commission of 1909-1921,"***(Archivaria* **vol. 37, 1994, 17 pp.***) available at http://journals.sfu.ca/archivar/index.php/archivaria/article/view/11986/12949).*

*For an interesting "***Environment and Sustainability Chronology***" (from Pre-History to 2002) see the web site of* **The Sustainability Report,** *http://www.sustreport.org/ . (This web site appears to have become static after 2004.) See also "***A Guide to Sustainability,***" final draft of a first chapter, dated* **May 1995,** *available on the* **IISD** *web site at http://www.iisd.org/worldsd/canada/projet/choices/guide.htm . (The other chapters appear not to have been written.)*

Finally, I signal Scientific American*'s recent expression of what SD is not:*

Michael D. Lemonick, "Top 10 Myths about Sustainability," ***Scientific American Earth 3.0,*** **March 2009, pp. 40-45.**

The ten myths deftly counter-argued are:

Nobody knows what sustainability means;
Sustainability is all about the environment;
"Sustainable" is synonym for "green;"
It's all about recycling;
Sustainability is too expensive;
Sustainability means lowering our standard of living;
Consumer choices and grassroots activism, not government intervention, offer the fastest, most efficient routes to sustainability;
New technology is always the answer;
Sustainability is ultimately a population problem; and
Once you understand the concept, living sustainably is a breeze to figure out.

SECTION 2 More Sustainable Business Conduct – General

2.1 Introduction

> It's hard to imagine a more active year in green business than 2007. Except, perhaps, for 2006. And likely 2008, 2009, and beyond, for that matter. Point is, every year lately seems to be a banner year when it comes to the greening of mainstream business — another 12 months of new and substantive corporate commitments and initiatives, technological breakthroughs, reports and tools, partnerships and consortia, and various other achievements and developments.
>
> Joel Makower (2008:4)

What does becoming more sustainable mean in practice? What are companies actually doing? What does a sustainable company look like? **Achim Steiner** *is Under Secretary-General and Executive Director of the UN Environment Programme (UNEP). Here is what he said at the* **UN Business and Environment Summit** *in* **Singapore** *on* **19 April 2007***:*

> What in UNEP's view is the environmentally responsible company? It is the company that takes steps such as the following:
>
> - Re-define company vision, policies and strategies to include the 'triple bottom line' of sustainable development.
> - Develop sustainability targets and indicators (economic, environmental, social).
> - Establish a sustainable production and consumption programme with clear performance objectives to take the organisation beyond compliance in the long-term.
> - Work with suppliers to improve environmental performance, extending responsibility up the product chain and down the supply chain.
> - Adopt voluntary charters, codes of conduct or practice internally as well as through sectoral and international initiatives to confirm acceptable behaviour and performance.
> - Measure, track and communicate progress in incorporating sustainability principles into business practices, including reporting against indicators as found in the Global Reporting Initiative (GRI) Guidelines.
> - Ensure transparency and unbiased dialogue with stakeholders.

Note that triple bottom line thinking is embedded in his prescription and that he asks that companies "take steps" toward such behaviour and "measure, track and communicate progress."

The media company GreenBiz.com attempted an assessment of how much US firms had changed in 2007:

Joel Makower and the editors of GreenBiz.com, State of Green Business 2008, Greener World Media, January 2008, 64 pp.

From over 1000 stories that appeared on 'green' business web sites, the editors selected ten and also provide 2-pagers with data and discussion on each of 20 topics. Each are given a 'swimming', 'treading' or 'sinking' tag. Eight show progress (carbon transparency, clean-technology investments and patents, energy efficiency, green office space, paper use & recycling,, quality of management, and toxic emissions), two (carbon intensity and E-waste) are sinking. A section at the end lists "Indicators we wish we had" which include water and materials efficiencies, green job creation and green business growth.

In March 2008, the Economist Intelligence Unit surveyed 320 executives around the world about their attitudes toward environmental risk management:

Economist Intelligence Unit, Under the spotlight – The transition of environmental risk management, The Economist, May 2008, 22 pp.

The number of respondents was about equally from Asia & Australasia, North America, and Western Europe. Forty-two percent of the respondents represented businesses with annual revenues below US$500 million. The primary industry of 41% of the respondents was Financial services, the remainder were from 14 other industries.

The survey found that many companies have a long way to go before achieving fully integrated environmental risk management. Only 31% avoided managing risk in an *ad hoc* manner. Where responsibility for environmental risk management rests varies widely among companies.

The Canadian Federation of Independent Business (CFIB) surveyed about 10,000 of its members in 2007, identifying their concerns and responses regarding environmental issues:

CFIB, Achieving Eco-prosperity – SMEs' perspectives on the environment, March 2007, 36 pp.

Recycling and energy conservation have become top concerns since a similar survey was held in 2000. Two-thirds of respondents have made minor energy-related changes and 17% have implemented major changes such as purchased energy efficient machinery. Seventy-one percent have introduced or expanded recycling. Half of the respondents were motivated by cost savings in making changes but 'personal views' dominated as motivator and about a quarter also cited regulations, views of employees or customer or supplier needs. ([8])

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[8] Additional references to this survey will follow in Sidebar 2 and section 7.4.

Finally by way of general background, we note the existence of a Canadian **Research Network for Business Sustainability (RNBS)** *which is supported by two federal departments (Industry and Natural Resources Canada), the Social Sciences and Humanities Research Council, the IISD, the Pembina Institute, the Retail Council of Canada and about ten major corporations. The network is managed out of the Richard Ivey School of Business at the University of Western Ontario* (ref.: **www.SustainabilityResearch.org**). *It seeks to bridge the gap between research and business practice in the fields of SD, social responsibility and ethics. A large number of research projects currently pursued by Network members are listed on the web site. Each year its Leadership Council meets and determines research priorities, two of which are funded with a $25,000 grant. The most recent set of priorities formulated is in:*

RNBS, Knowledge Priorities in Business Sustainability: Questions, Experts, and Opportunities 2008/09, n.d., 15 pp.

The two projects funded out of a list of nine were: "How do businesses incorporate adaptation to climate change into their business strategies?" and "Do consumers consider social or environmental attributes when making purchase decisions?" Summary reports are available on the Network's web site and fora were held on each topic.

The previous year the top question was about metrics for proving the business case for sustainability. The resulting reports will be annotated in section 4.2 below.

2.2 General Frameworks

How to go about becoming more sustainable? Ann Dale supports the suggestion of earlier researchers that a "useful model for making a deeper transition" to SD is for a firm to evolve from "making minor 'efficiency' changes to substituting activities, then to totally rethinking and redesigning its structures, processes and procedures." (Dale 2001:89) Two more specific general frameworks to achieve greater sustainability have been developed: The Natural Step *and* Natural Capitalism.

The Natural Step (ref. www.naturalstep.ca/*)*

Karl-Henrik Robèrt et al., "Strategic Sustainable Development - Selection, Design and Synergy of Applied Tools," *Journal of Cleaner Production*, Vol.10 (2002), pp. 197-214.

The Natural Step (TNS) sets out four Systems Conditions for a Sustainable World:
Nature must not be subject to increasing
1) concentrations of substances extracted from the earth,
2) concentrations of substances produced by society, and
3) degradation by physical means;
and
4) people must not be subjected to conditions that systematically undermine their capacity to meet their needs.

The article offers a synthesis of principles and tools in the context of the systems approach to sustainability. Included are discussions of dematerialization, strategic investing and various political measures; various tools and metrics; and various organizational initiatives.

Brian Nattrass and Mary Altomare, Dancing with the Tiger – Learning Sustainability Step by Natural Step, New Society Publishers, 2002, 288 pp.

Presents the stories of individuals, teams and organizations learning about change and sustainability, and then acting on that learning. Case studies include Nike, Starbucks, CH2MHill, Home Depot and Norm Thomson Outfitters, as well as the municipalities of Whistler, Seattle and Santa Monica.

Brian Nattrass and Mary Altomare, The Natural Step for Business – Wealth, Ecology and the Evolutionary Corporation, New Society Publishers, 1999, 240 pp.

Examines "how four very successful 'evolutionary' corporations in Sweden and the United States - including IKEA and Scandic Hotels in Sweden, and Collins Pine and Interface in the U.S. - are positioning themselves for long-term competitiveness using The Natural Step as a central part of their corporate strategy. Nattrass and Altomare puncture the myth that a company must choose between profitability and care for the natural environment, and present a timely and practical application of this exciting model for global sustainability."

The 'backstory' of The Natural Step is told in:

Karl-Henrik Robèrt,, The Natural Step Story: Seeding a Quiet Revolution. Gabriola Island, BC: New Society Publishers, 2002, 276 pp.

Aims to "write the story so entertaining, trustworthy, and relevant that it may recruit more people into the dialogue..." The book explains how TNS is a learning organization that builds a bridge between science and decision making, especially in business.

Natural Capitalism (ref. www.natcap.org)

Paul Hawken, Amory Lovins and L. Hunter Lovins, Natural Capitalism: Creating the Next Industrial Revolution, [1999], Rocky Mountain Institute, Colorado.

From the web site:

> Natural capital refers to the natural resources and ecosystem services that make possible all economic activity, indeed all life. These services are of immense economic value; some are literally priceless, since they have no known substitutes. Yet current business practices typically fail to take into account the value of these assets—which is rising with their scarcity. As a result, natural capital is being degraded and liquidated by the wasteful use of such resources as energy, materials, water, fiber, and topsoil.

Natural Capitalism sets out four interlinked "principles:" radically increase resource productivity; redesign industry on biological models with closed loops and zero waste; shift from the sale of goods to the provision of services; and reinvest in the natural capital that is the basis of future prosperity.

The book shows

> how these four changes will enable businesses to act as if natural capital were being properly valued, without waiting for consensus on what that value should be. Even today, when natural capital is hardly accounted for on corporate balance sheets, these four principles are so profitable that firms adopting them can gain striking competitive advantage—as early adopters are already doing. These innovators are also discovering that by downsizing their unproductive tons, gallons, and kilowatt-hours they can keep more people, who will foster the innovation that drives future improvement.

Its preface states:

> Although [this] is a book abounding in solutions, it is not about 'fixes.' Nor is it a how-to manual. It is a portrayal of opportunities that if captured will lead to no less than a transformation of commerce and of all societal institutions. Natural capitalism maps the general direction of a journey that requires overturning long-held assumptions, even questioning what we value and how we are to live. Yet the early stages in the decades-long odyssey are turning out to release extraordinary benefits. Among these are what business innovator Peter Senge calls 'hidden reserves within the enterprise'—'lost energy,' trapped in stale employee and customer relationships, that can be channeled into success for both today's shareholders and future generations.

2.3 Guides

2.3.1 Guides geared to smaller firms or businesses in general

Lynn Johannson, President of E2 Management Corporation (E2M, Georgetown, Ont.) wrote a Handbook for the Asian Productivity Organization's Green Productivity Program (ref.: www.apo-tokyo.org):

Lynn Johannson, Handbook on Green Productivity, January 2005, pages not continuously numbered. Also Greening on the Go - A Pocket Guide to Green Productivity, 86 pp. + Annexes.

The Handbook is a *vade mecum* of concepts, processes, tools, techniques etc. for greening one's business, written in workshop style. (It evolved from a Manual for a 5-day training program.) It is fully consistent with triple bottom line thinking. Throughout, the emphasis is on how small and medium-sized businesses, by greening their operations, will enhance productivity and increase the financial health of the business.

In May 2007, in collaboration with Industry Canada and Environment Canada, Johannson published a workbook that is specifically geared to micro- and other small businesses:

Lynn Johannson, Going for the Green – A Manufacturer's Guide to Lean and Green, 2007, 64 pp.

Written in colloquial style, it is chock-full of facts and ideas for accomplishing specific improvements in a small-manufacturing context. The main device is the construction of "eco-maps" that show both problems and opportunities, e.g. on waste, energy, water & wastewater, on risks to health & safety, etc. (**Eco-mapping**, operating out of Brussels, Belgium, [ref.: **www.ecomapping.org/en/index.html**], exists in about 25 languages and has been used around the world.) One humorous "character" in the guide is Mother Nature, President of the Whole Earth Corporation, with whom all of us are under contract for products and services. Her commentary and advice throughout the book is often quite insightful.

Pp. 61-62 address some common myths such as "I am so small that what I do is not important" (counter: there are very many small firms) and "The big guys have to set the rules so that SMEs can follow" (counter of sorts: There is merit in big business taking the lead; and "very few companies have yet figured out how to leverage Mother Nature's attributes and incorporate them in innovative ways").

The paper version is not intended to be the main product. Available from the CFIB web site (at http://www.cfib.ca/en/smallbiz-solutions/business-resources.asp), the idea is to print the 64 pages and put them into a 3-ring binder so it can serve as a library of progress and success. It is reported to be the second- or third- most downloaded report from the CFIB web site.([9])

Two complementary **E2M***-authored papers:*

Going for the Green: How Canadian Small to Medium-sized Manufacturers View Environmental Issues and Their Businesses, Final Report, March 2006, 54 pp.

Characterization of Small to Medium-sized Enterprises of Canada, a Discussion Paper prepared for Environment Canada, September 2004, 74 pp.

An earlier, also down-to-earth guide was developed by the New Zealand Ministry for the Environment and is still available on its web site (ref.: www.mfe.govt.nz *):*

New Zealand Ministry for the Environment, Enterprise^3 – Your Business and the Triple Bottom Line – Economic, Environmental, Social Performance, Sustainable Business Network, 2003, 34 pp.

Using very straightforward language, the guide/workbook explains the triple bottom line, how to get started, what practical things one can do, how to tell whether one has made a difference, and how to tell others.

Also on this Ministry's web site is a **How to Guide - Making you and your workplace more environmentally sustainable**, *published* **March 2007, 2 pp.** *It offers about 30 suggestions that are "Easy to do – most are free (and may even save you money); Moderate things to do – minor cost/effort; or Significant actions – a bit more cost or effort."*

Other General guides:

- *An earlier workbook-style publication of the Ontario Division of* ***Canadian Manufacturers & Exporters:***

Canadian Manufacturers & Exporters - Ontario Division, Gaining the Competitive Edge - An Environmental Guidebook for Small and Medium Sized Enterprises, n.d., 54 pp.

This guidebook was developed in partnership with two Ontario Ministries and uses the

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[9] Personal communication with Lynn Johannson, 3 September 2008.

same "Business results" approach as its other guidebooks such as on Health & Safety etc. There is no publication date but internal references suggest it was published after 2002. A first part provides a regulatory roadmap. Part II presents environmental leadership opportunities by way of six business cases (for cost savings, supply chain management, improved public relations, employee enthusiasm, legislative compliance, and reduced risk and liability), followed by five activities to improve business results (waste reduction, material substitution, product reformulation, improved energy efficiency, and process modification). Each business case or activity is illustrated by case studies (each about half a page long) that "illustrate the small changes that small and medium sized enterprises can make while still achieving outstanding environmental and financial results." Part III offers worksheets that focus on the financial gains that can be realized as a result of the suggested environmental activities.

- ***Canadian Business for Social Responsibility*** *(CBSR - ref. http://www.cbsr.ca/) is "a business-led, non-profit ... consultancy and peer-to-peer learning organization that provides its members with candid counsel and customized advisory services ... that improve performance and contribute to a better world." It was founded in 1995 and has offices in Vancouver and Toronto. Its web site listed close to 100 members in July 2007. A summary of its* **GoodCompany Guidelines for Corporate Social Performance** *is available (***2002, 14 pp.***); the full Guidelines can be purchased for $100 or are complimentary with membership. Yearly membership costs $7,500 for corporations with less than $1 B in annual revenue, $15,000 for companies with more.*

  The summary displays checklists covering the Community, Employees, Suppliers, the Environment, Shareholders, and International Operations. In the full Guidelines, those that are best suited for SMEs are flagged. The CBSR approach is very flexible, any changes in ways of operating being completely at the discretion of the members.

- *Back in 1995, the* ***Canadian Standards Association*** *already put out a document to guide small businesses to leaner and greener practices:*

  C.S.A., Competing Leaner, Keener and Greener – A Small Business Guide to ISO 14000, Plus 1117, 1995, unnumbered pages. (Obtained through i/l loan from the Alberta Government Library, TD 194.7 C737 1995.)

  Of decidedly sterner tone than, e.g., Going for the Green, the workbook is geared to small firms and aims to introduce the user to the principles of an environmental management system aligned with ISO 14004. (More on ISO 14000 below.)

- *Another older reference written for SMEs, with focus on climate change:*

  Duncan Noble, Cool Business Guide: Lower Costs, Higher Productivity and Climate Change Solutions, March 2001, Pembina Institute, 100 pp.

"...designed to help managers of small and medium-sized businesses learn how they can respond to and profit from actions to address the climate change challenge... [to] achieve lower costs, higher productivity and increased competitiveness."

- *The* **Global Compact** *recently published a guide for medium-sized companies:*

The UN Global Compact Operational Guide for Medium-Scale Enterprises, July 2007, 17 pp.

In 2006 the GC Office appointed an international expert group to develop an Operational Guide for SMEs (50 to 200 employees). This is its first publication; three others are to follow. It is a general guide to implementation of the GC's ten principles and how to get involved in the process.

- *A new annual publication by the US Environmental Defense Fund presents a selection of green innovations:*

Environmental Defense Fund, Innovations Review 2008 - Making green the new business as usual, New York, 2008, 34 pp.

More than 230 innovation ideas were assessed based on their environmental benefits, business benefits, replicability and innovativeness. Ten innovations that any company could implement made the cut, plus ten others that either apply to a specific industry or are "game-changers." A web site offers additional resources and links.

- *In September 2006, with funding support from Industry Canada and Natural Resources Canada as well as two Ontario Ministries, the* ***Canadian Chamber of Commerce and Pollution Probe*** *published:*

A Guide to Climate Change for Small- to Medium-sized Enterprises – How to Plan for Climate Change, Reduce Operating Costs and Develop New Business Opportunities, September 2006, 48 pp.

Discusses how businesses can adapt to climate change, how they can help reduce it and how to assess opportunities for energy-efficient investments. Decidedly not a workbook.

Note as an aside that last year the CCC participated in the review of the 1999 Canadian Environmental Protection Act. *The Chamber stated that it was "very pleased that sustainable development was made an overarching goal of the CEPA 1999." The term SD "could very well have originated from the business world," it said, "because what it really means is survival, of both business and the environment." Indeed, as far back as 1989, the CCC's Task Force on Environment had released a report stating that "The state of our environment has become a major national issue and it is time that Canadian business people took the initiative in dealing with ecological problems" and that business needs to rapidly move to more environmentally sustainable practices, because the benefits will outweigh the costs. (Cited in the* Chronology *on* The Sustainability Report *web site, referenced in Sidebar 1 above.)*

- *Another recent initiative specifically aimed at small businesses is the* Carbon Neutral Workgroup for Small Business, *a program to help SMEs shrink their carbon footprint. The program is offered by* **Ecotrust Canada**, *in partnership with The Pembina Institute, the David Suzuki Foundation and corporate sponsors (Source:* **Pembina Institute media release, 28 June 2007**.*) The Workgroup represents "some of B.C.'s most progressive and innovative small businesses in the fields of tourism, eco-forestry, fisheries, manufacturing, transportation and green building." Workshops will show companies how to calculate and reduce their carbon footprint and will help entrepreneurs purchase carbon offsets.*

Finally, some web site references:

- The BC Climate Exchange *web site offers references to 65 resources helpful to businesses.*

*- Industry Canada's "*SMEs - Improve Your Environmental Performance*!" web site provides long lists of Technical Assistance, Financial Assistance, and Demonstration and Workforce Training references.*

- A recently published section on IC's SME Direct *portal,* Clean, Lean and Green *is the result of collaboration between Industry and Environment Canada. The site provides links to eight Tools and Guides, national and regional Programs, and two Resource Databases. There is also a section with Awards and Success Stories.*

2.3.2 Guides geared to larger businesses

(Please see also section 1.1 for an annotation of **WRI et al. (2008)**, *a business risks and opportunities tool.)*

Two recent publications appear to aim for a comprehensive explication of how to "do" sustainability:

Marc J. Epstein, Making sustainability work – Best practices in managing and measuring Corporate Social, Environmental sand economic Impacts, Greenleaf Publishing and Berrett-Koehler Publishers, Inc., San Francisco, 2008, 288 pp. IC Library Queen HD60.E6 2008

This is a follow-up to Epstein's 1996 Measuring Corporate Environmental Performance: Best Practices for Costing and Managing an Effective Environmental Strategy. It is a how-to book for large, global corporations that already know they must practice some form of corporate social responsibility or move towards greater sustainability but are not sure how to go about

it. Sidebars throughout the book give examples from about 100 companies (of which two are, or were Canadian: Alcoa and Ontario Hydro). The text itself and various Figures also in large part consist of capsule description or examples of how this or that company has done it. Copious endnotes refer to a lengthy bibliography of over 300 items, from both media and academic and semi-academic literature.

The introduction offers four reasons "why sustainability now demands our urgent attention": regulations; pressure from the public and NGOs; creating financial value (more revenues, reduced costs); and "societal and moral obligations" (sometimes through the CEO personally). The Introduction concludes: "So companies know that it is critical to formulate a sustainability strategy." The book promises to provide "a framework and model for implementing sustainability in large, complex, global organizations."

Chapter 1 describes the Corporate Sustainability Model. The meaning of sustainability is captured in nine principles covering ethics, governance, transparency, business relationships, financial return, community involvement/economic development, value of products and services, employment practices, and protection of the environment. Next, the author advises to identify the company's stakeholders (broadly defined) and map out its accountability structure. The Model recognizes Inputs (external, internal, business context, and human & financial resources), Processes (leadership in sustainability strategy, structure, and systems, programs & actions), Outputs (sustainability performance and stakeholder reactions) and, finally, the Outcome: long-term corporate financial performance. Feedback loops throughout.

Figure 5: Corporate Sustainability Model

The next chapter is devoted to the importance of leadership that will lead to institutionalizing sustainability in the organization. It sees strategy development going through three stages: from regulatory compliance, to seeking competitive advantage, to fully integrating social and environmental components into corporate life. Chapters following discuss various topics such as organizing for sustainability, costing issues, risk assessment, measuring performance, incentive programs and shareholder value analysis. Two chapters deal with measuring social, environmental and economic impacts. The concept of Value (benefits) is explained to have both market and non-market components, and to refer to both use value and non-use value (the latter including option and existence value). One section describes various methods of measuring social and environmental impacts and risks. Six tables offer examples of metrics for each of the components of the Sustainability Model of Chapter 1.

Chapters 8 and 9 discuss, respectively, making improvements within the firm and reporting on performance external to the firm. A final chapter sums up what the pay-offs are, for the corporation and society, of improved sustainability performance.

The Index offers but a single reference to SMEs – a passage that explains the constraints SMEs live under to practice proper capital budgeting .

William R. Blackburn, The Sustainability Handbook, The complete management guide to achieving social, economic and environmental responsibility, London: Earthscan, 2007, 812 pp.

The author, a lawyer and former executive with Baxter International Inc., appears to have set out as a goal to explain and document "everything" – a three-year effort.([10]) The book is explicitly geared to large companies and to both "people who know nothing about sustainability as well as to seasoned experts who are anxious to hone their approach to the concept." The language is colloquial, the pace leisurely. Few references are later than 2005.

One chapter, oddly entitled "Approach to Sustainability for Small and Struggling Companies," explores "what adaptations may make sense for small and financially disadvantaged companies." This contains two pages on "Big companies in desperate financial condition" but further a series of examples of small companies that have successfully implemented something.

One main message is explained in an 8-page text table spelling out the recommended "Model Sustainability Operating System (SOS) Standards." A "Model Code of Conduct for a Sustainability Team" is a merciful one page. Throughout the book there are case histories, checklists, and long lists of information capsules, such as on Trends (36 of them, spread over a 95-page Appendix), on Metrics (for companies, governments and universities), on Codes of Behaviour, on Management System Standards, on Functional Groups (22) that are implicated in sustainability, and much more.

In July 2008 *the* **WBCSD** *launched a* **Measuring Impact Framework**, *developed in collaboration with 25 multinational companies over a 2-year period. Available from the WBCSD web site are: Business case brief - Why measure? Framework methodology; Excel-based user guide; How to use the Excel guide; and a PowerPoint presentation.*

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[10] As if to set the tone, the very first footnote explains that Albert Einstein was a "brilliant physicist ... who lived from 1879 to 1955."

Also from the WBCSD:

WBCSD, Adaptation – An issue brief for business, Energy and Climate Focus Area, July 2008, 26 pp.

The report broadly reviews business risks and opportunities resulting from climate change, "inside the fenceline" (operations and supply chains), "beyond the fenceline" (local communities) and "beyond the horizon" (global consumer markets).

Figure 6: General business risks and opportunities resulting from climate change impacts

A second figure uses the same pattern to illustrate action to minimize risks and to leverage opportunities.

Figure 7: Areas for business action on adaptation

Nine sectors are spelled out a bit more: agriculture, fishing & forestry; energy & utilities; water; healthcare; insurance; tourism; retail; logistics/distribution & transport; and industry/manufacturing.

It finds the key drivers of adaptation planning to be competitive advantage, cost savings, liability management, investor pressure, regulation, and community resilience.

Finally, on guidance for large companies and their relation with SMEs:

- *We saw a draft paper by* **Rebecca Young** *of the WBCSD, dated* **January 2004**, *entitled"* **"Small & Medium Size Enterprises & Sustainable Development: A scoping paper on the large company link" (48 pp.)** *It sets out the business case for large company involvement in fostering sustainability in SMEs. Appendices provide extensive lists of toolkits for SMEs and existing SME initiatives, national and international.*

- *In the same vein, but with focus on developing economies, is an Issue Brief from the Dutch development organization* **SNV and the WBCSD***'s Development Focus Area,* **Promoting Small and Medium Enterprises for Sustainable Development, (24 July 2007, 12 pp.).** *The brief suggests how large companies can work with small companies to develop the economy and fight poverty.*

2.4 Special topics

2.4.1 Eco-efficiency

Not so long ago, much of the effort in reducing the environmental impact of businesses went under the name of "eco-efficiency." ([11]) Eco-efficiency aims to simultaneously increase the value of a product or service, optimize the use of resources and reduce the activity's environmental impact. The touted benefits are reduced costs, reduced risk and liability, increased revenue, enhanced brand image, increased productivity and employee morale, and improved environmental performance (ref.: Industry Canada's Eco-efficiency *web site).*

In effect, eco-efficiency addresses two of the three pillars of SD: the environmental and the economic. Initially interpreted largely as aimed at preventing pollution in manufacturing, the concept has evolved considerably.

In the past, Natural Resources Canada, in coordination with Industry Canada and Environment Canada, has offered eco-efficiency workshops in cities across Canada (ref. NRCan's Sustainable Development *web site, under* Building Capacity*).*

Most recently, the **WBCSD** *made available an* **Eco-efficiency Learning Model (January 2006).** *The module comprises learning materials and exercises about the business drivers of eco-efficiency, key strategies and tools, and how eco-efficiency may be integrated in the business decision-making process.*

Other tools available on ***Industry Canada's*** Eco-efficiency *web site include:*

- Three Steps to Eco-efficiency, aimed at small and medium-sized manufacturers. Step 1 is a self-assessment, step 2 offers some generic strategies depending on the score obtained and step 3 suggests what costs and benefits should be considered.

- An Environmental Management Tool Kit – downloadable tools to improve environmental performance.

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[11] *The term was coined by S. Schmidheiny in a 1992 paper for the Business Council for Sustainable Development. (Referenced on page 152 of* **Jonathan Hobbs,** ***"Promoting cleaner production in small and medium-sized enterprises"*** *in* **Ruth Hillary, editor, Small and Medium-Sized Enterprises and the Environment, Greenleaf Publishing, 2000,** *pp. 148-157.)*
The ***Eco-Efficiency Centre*** *in Burnside Industrial Park in Dartmouth, N.S., opened in 1998.*
Ref. **http://eco-efficiency.management.dal.ca/index.php** .

- Material used in the Eco-efficiency workshops – "overview of six established concepts and proven tools."

The Eco-efficiency/Industry Practices *page also provides access to Canadian success stories, an Australian collection of case studies, an OECD report on biotechnology, and a WBCSD collection of eco-efficiency case studies.*

***Environment Canada**'s web site (under* Information for Business, Energy Conservation*) has a list of over 160 Incentives and Rebates offered by governments, energy companies and others "to help you use less energy, switch to renewable energy and produce less waste at home and on the road." See also **Natural Resources Canada**'s* Directory of Energy Efficiency and Alternative Energy Programs in Canada.

In 1997 and 1999 the National Round Table on the Environment and the Economy published two papers in an attempt to identify indicators of eco-efficiency:

NRTEE, Backgrounder: Measuring Eco-efficiency in Business, 1997, 61 pp.

NRTEE, Measuring Eco-efficiency in Business: Feasibility of a Core Set of Indicators, 1999, 55 pp.

In 1996 the federal government expressed its intent to move towards sustainable development through innovation. ([12]) In response, the NRTEE, in cooperation with the WBCSD, set up a Task Force. The 1997 paper identified three potential indicators: a resource productivity index (materials contained in a firm's outputs as a percentage of materials and energy consumed in their production); a toxic release index; and a "product and disposal cost to durability ratio" (purchase price + disposal cost divided by years of life). After a year of study and a workshop in Washington, D.C., the Task Force concluded that development of the first two indices should be pursued. Still, in regard to the first index, it recognized that materials and energy intensity or efficiency also should be dealt with.

The second paper also saw the cooperation of eight of Canada's largest companies. It settled on an energy intensity indicator (energy consumed per unit of output) as widely applicable and meaningful. As well, for certain industries, it concluded that a material intensity indicator would be feasible. A third option put forward was a pollutant dispersion indicator.

Two other older references, on eco-efficiency and innovation:

Five Winds International, The Role of Eco-Efficiency: Global Challenges and Opportunities in the 21st Century. Part 1: Overview and Analysis, May 2000, 50 pp. Part 2: Industry Case Studies.
(Downloadable from IC's Eco-efficiency web site, u/ Industry Practices.)

Study undertaken for an "interdepartmental Eco-efficiency Working Group" led by NRCan. Seven detailed case studies and eight shorter vignettes (all of large corporations) lead to the conclusion that "companies who are anticipating and implementing eco-efficiency are doing so to get out in front of market and regulatory trends, to

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[12] In the Government's response to a Science and Technology Review, Science and Technology for the New Century, Minister of Supply and Services, 1996.

reduce costs, to gain competitive advantage and to ensure long-term profitability and sustainability." The study finds "a clear linkage between innovation and competitiveness, and eco-efficiency."

Giuliano Noci and Roberto Verganti, "Managing 'green' product innovation in small firms," *R&D Management*, vol. 29, no. 1 (1999), pp. 3-15.

The authors agree with the consensus in the literature that "eco-efficiency will be one of the major challenges for R&D practice and theory in the next decade." They seek to show that 'green' product innovation is relevant for SMEs as much as for large corporations. Four case studies of "pioneering small firms" with between 23 and 320 employees are analyzed in detail: major drivers, phases and roles, etc.

In a class of its own is:

Pierre Desrochers, "Does it Pay to be Green? Some Historical Perspective," Chapter 3 in Sustainable Development: Promoting Progress or Perpetuating Poverty?, edited by Julian Morris. Profile Books, London, August 2002, 11 pp.

Using quotes from 1835, 1862, 1875, 1876, 1902, 1920 [Marshall!], 1927, 1928 and 1939, the author demonstrates that eco-efficiency is nothing new.

Related references, again from Industry Canada's Eco-efficiency *web site (under* Eco-efficiency Links*):*

- The Pembina Institute has a tool to achieve "One Less Tonne" of emissions.
- CleanerProduction.com offers "offers sustainable business training and consulting services around the world, with specialization in practical tools for increasing environmental performance..."
- The International Society for Industrial Ecology promotes "the use of industrial ecology in research, education, policy, community development and industrial practices."
- The Journal of Industrial Ecology is a peer-reviewed academic journal that addresses "material and energy flows studies, dematerialization, life cycle planning, design and assessment, design for the environment, extended producer responsibility, eco-industrial parks, product-oriented environmental policy, and eco-efficiency" (quoted from the IC web site.)
- The Canadian Centre for Pollution Prevention – lists support programs, industry-specific resources and a Canadian and international success stories data base geared to Small Business. (Ref. http://www.c2p2online.com .)
- Environment Canada maintains web sites for the Canadian Pollution Prevention Information Clearinghouse and for its National Office of Pollution Prevention.

- Also under EC's aegis is the Environmental Technology Advancement (ETA) web site, "aimed at developing and applying science and technology for environmental protection in Canada and around the world." There is also an Ontario equivalent, Ontario Centre for Environmental Technology Advancement (OCETA). Its mandate is to provide "business services to entrepreneurs, start-up companies and small to medium-sized enterprises to assist the process of commercialization of new environmental technologies and to support sustainable economic development both domestically and internationally."

2.4.2 Supply chain management

One important way of drawing SMEs into the adoption of sustainable practices is through conditions imposed by large corporations. "Supply chain management is a cross-functional approach to managing the movement of raw materials into an organization and the movement of finished goods out of the organization toward the end-consumer" (Wikipedia). *Several large corporations are known to actively pursue 'greening' their supply chain. When large firms change their practices, then smaller firms will feel the effect.*

Wal-Mart, whose CEO 'got religion' in 2005 ([13]), is a well-known example of leveraging its sustainability vision into supply chain requirements – it states that it expects 90% of its environmental impact to come through influence on its supply chain and has established over a dozen "sustainable value networks" to make it happen (ref. ***Supply Chain Digest*****, August 17, 2006**). *In November 2007, Wal-Mart released its first report,* "Sustainability Progress to date, 2007-2008," *to mixed reviews. ([14]) Also in 2007, Wal-Mart entered into a partnership with the*

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[13] **Lee Scott, Wal-Mart - Twenty First Century Leadership, October 24, 2005, 16 pp.**

[14] **Wal-Mart, Sustainability Progress to date, 2007-2008, November 15, 2007, 59 pp.** *and* **Anne Moore Odell, SocialFunds.com** *and* **GreenBiz.com, 19 November 2007**. *See also Wal-Mart's annual* **Report on Ethical Sourcing** *(the* **2006** *issue,* **40 pp.**, *was released on* **August 15, 2007**), *its* **Ethical Standards Program** **(2 pp.)** *and its* **Standards for Suppliers** **(1 p.)**. *Its Packaging Scorecard initiative, launched in 2006, aims to reduce packaging by 5% by 2013. In February 2008, reportedly 80% compliance had been achieved, covering over 97,000 products from over 6,000 vendors. (Source:* **Nichola Groom, *Reuters*, 7 February 2008; Environmental Leader**, *issues of* **20 September 2006**, *and* **1** *and* **8 February 2008**.*) For some background about Wal-Mart's SD strategy, see a talk by* **Lawrence Jackson**, *former President*

Carbon Disclosure Project (CDP - see section 5.4 below) to send the CDP survey to a subset of Wal-Mart's suppliers. This led to the CDP's launch of a Supply Chain Leadership Collaboration project.*([15])*

Hewlett-Packard has an 8-point Supply Chain Social and Environmental Responsibility (SER) program sponsored by a Supply Chain Council consisting of the top supply chain managers at the company. At the end of 2003 it had its top 45 suppliers engaged in the program, representing 80% of its spending on product materials. (Source: **Dick Conrad, *Electronics Supply & Manufacturing*, 2004**).

Other companies actively engaged in greening their supply chain include Home Depot, General Motors, Bristol-Myers Squibb and Xerox.

The NAFTA-related Commission for Environmental Cooperation has reported on a Greening Supply Chains project with SMEs supplying large firms in Mexico:

Commission for Environmental Cooperation, <u>Greening Supply Chains – Report on Activities and Results</u>, March 2008, 21 pp.

Four large companies (Colgate-Palmolive, Bristol Myers Squibb, SIKA Mexicana and JUMEX) participated along with 52 of their suppliers in a program to test "new, replicable

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and CEO, **"Wal-Mart: Implementing Proactive Sustainability Programs,"** *in* **A.T. Kearney, <u>Business and Sustainable Development – Moving from defensive to preemptive strategies</u>, The proceedings of the first annual A.T. Kearney Sustainability Roundtable, June 2007, The Waux Hall, Brussels, 12 pp., pp. 6-8**. *For another perspective, see* ***Ethical Corporation*, 10 July 2008**.

[15] *On May 1, 2008, CDP released a first report on its findings under this Project. An undisclosed number of suppliers of 11 major companies (surprisingly, not including Wal-Mart) were surveyed; 144 responded, and of these, 49 were already reporting through CDP. The survey appears to have dealt only with generalities such as opinions and what GHG emissions they report on. Another 13 companies have now joined the Project and a second survey will be sent out to over 1,000 suppliers.* **Stephen Leahy (*IPS*, 30 April 2008)** *opines at the occasion of this initiative that "Measuring and then reducing carbon emissions will shortly be a way of life for all companies." The current member companies of this* Supply Chain Leadership Collaboration *project are: Cadbury Schweppes, Carrefour, Colgate-Palmolive Company, Dell Inc., Exelon Corporation, Fiji Water, Heinz, HP, Imperial Tobacco Group, IBM, Johnson Controls, Juniper Networks, Kellogg Company, L'Oréal, Merrill Lynch & Co., Inc., National Grid, PepsiCo UK & Ireland, Inc., Procter & Gamble Company, Reckitt Benckiser, SSL International, Tesco, Unilever, and Vodafone Group.*

mechanisms for promoting pollution prevention in SMEs that supply large companies." These included training and technical assistance. A total of 121 projects were formulated. They required P$20 million in investment and anticipated P$40 million in annual savings plus substantial savings in materials input and waste.

Comment: Activities reported on took place in 2005 and 2006 but the report provides only anticipated, not actual costs and benefits.

In July 2008 TerraChoice *issued its* Ecomarkets 2008 Summary Report, *compiling responses from 336 US and Canadian procurement professionals. Sixty-two percent of their companies had green procurement policies and one-third said that 40% or more of their spending was influenced by such purchasing policies or other environmental factors. Ninety-one percent believed that they will increase their green purchases in the next two years. (Source:* ***Greenbiz.com*****, 22 July 2008[1].)**

A year earlier, a survey of 188 procurement professionals in the U.S., Europe and Asia (representing mostly transportation/logistics and high-tech industries) by **EyeForProcurement (GreenPurchasing, July 2007, 16 pp.)** *found that more than 50% have policies on greening their supply chains and almost all believe that this trend will continue. Most impacted are packaging materials and raw materials used in manufacturing. Still, only 13% said that they were acquiring half or more of their materials or services in this way, with 55% saying that less than 10% was so acquired. The report cites an estimate by the Center for Advanced Purchasing Studies that the market for environmentally friendly goods now tops US$200 billion. (See also:* ***Greenbiz.com*****, 8 August 2007.)**

Also in 2007, **A.T. Kearney and the Institute for Supply Management** *surveyed 25 North American Fortune 100 companies across a variety of industries and found that 50% of companies will deselect suppliers that do not meet sustainability criteria; only five years earlier, this was a rare phenomenon. The study identified the "supply chain as a key source of value creation." (See also* ***Globe-Net*****, 10 April 2007.)**

And still in 2007, Industry Canada sponsored a paper by the Sustainability Purchasing Network *(a program of the Fraser Basin Council, a BC-based not-for-profit organization):*

Amy Robinson and Coro Strandberg, Sustainability Purchasing – Trends and Drivers, November 2007, 61 pp.

Describes sustainable purchasing as a growing global trend. Reviews some recent developments and regulatory measures in Canada, the UK, the US, Europe and Asia, covering both environmental and social (health, human rights) issues. Identifies the top product areas for sustainable purchasing programs. Includes two case studies: Hudson's Bay Co. and Catalyst Paper.

Diamond, a Chicago-based management and technology consulting firm, positions greening of the supply chain in the context of a holistic approach:

Mark Baum and Darin Yug, The Case for a 'Green' Supply Chain: Turning Mandate into Opportunity, Diamond Consultants, 8 April 2008, 8 pp.

Proposes to think of the Green Supply Chain as a chain that has "integrated environmental thinking into core operations from material sourcing through product design, manufacturing, distribution, delivery, and end-of-life recycling." It puts five questions to senior executives and suggests that if any of them are answered in the negative, they're missing out on creating shareholder value and are ceding advantage to their competitors.

Also in 2008, **Global Commerce Initiative** *([16]) and* **Capgemini** *issued* **Future Supply Chain 2016** *– a Report and an Appendix with leading practices and more – all available on the project's web site,* **www.futuresupplychain.com** *. This is a follow-up to an earlier report from Capgemini, "2016: The Future Value Chain Report," which is said to have provided a "vision of the total value chain for consumer goods from manufacture to consumption." A spreadsheet model is also available. The model claims to take into account sustainability metrics such as CO_2 emissions and energy consumption.*

IBM for its part launched a Carbon Tradeoff Modeler that allows companies to "tweak their operations and see how changes to packaging, transportation and inventory policies can affect their CO_2 emissions." (Source: ***GreenBiz.com*****, 22 May 2008.)**

A few older references:

- **Pacific Northwest Pollution Prevention Resource Center, Supply Chain Management for Environmental Improvement, January 2002 (updated April 2004),** http://www.pprc.org/pubs/grnchain/index.cfm

  Provides an extensive list of practical suggestions on greening the supply chain. Includes over 40 case studies.

- *The* **US Environmental Protection Agency** *supports a* **Green Suppliers Network** *(*http://www.greensuppliers.gov/gsn/ *), a collaborative venture with large manufacturers "to engage their small and medium-sized suppliers in low-cost technical reviews that employ*

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16 *The* Global Commerce Initiative *(www.gci-net.org) "brings manufacturers and retailers together on a worldwide parity basis to simplify and enhance global commerce and improve consumer value in the overall retail supply chain."*

Lean and Clean methodologies to increase productivity, reduce waste, and boost profitability." The initial pilot began in 2001 with General Motors and Saturn Corporation and is now open to any U.S. manufacturer.

- **Rebecca Young (2004)**, *in the draft paper cited in section 2.3.2, built much of the business case for large company involvement in sustainable development for SMEs on supply chain management reasoning.*

2.4.3 Standards and Environmental Management Systems

2.4.3.1 Introduction

One effective approach to adopting sustainable practices is to adhere to widely accepted standards or implement an environmental management system (EMS). This thinking owes much to W. Edwards Deming (1900-1993), the American statistician who had enormous influence on Japan's industrial rebirth after the Second World War; the "Deming cycle," e.g., refers to "Plan-Do-Check-Act," a mantra still widely in use.([17]) Another broadly applicable philosophy is Kaizen, Japanese for "continuous improvement," often associated with Toyota's production methods. Also well known is the Total Quality Management paradigm.

One of the earliest attempts at establishing a code of corporate environmental conduct for corporations was promoted by CERES. ([18]) They were originally named the "Valdez principles" because they were initiated in the wake of the Exxon Valdez spill of 1989. Now known as the ten **CERES Principles**, *these principles of good behaviour are endorsed by over 80 companies including Canada's Suncor Energy Inc.* (Ref.: www.ceres.org , *under "About Us.")*

A widely applicable EMS technique is Life Cycle Assessment (LCA). *It assesses the environmental impact of a given product or service throughout its lifespan. LCA is embedded in ISO 14000. In May 2007, ten corporations joined to pledge to the École Polytechnique in*

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[17] *An often-used variant is "Plan, Do, Check, Improve." See, for example, pages 19 of the CSR Implementation Guides of* **Industry Canada ([2005])** *and* **IISD (2007)**, *referenced in section 5.1 below.*

[18] **CERES** *is a coalition of investors, environmental groups and other public interest organizations headquartered in Boston, MA (www.ceres.org/). The acronym stands for Coalition for Environmentally Responsible Economies. The Coalition was formed in 1989 at the instigation of the Social Investment Forum, an association of socially responsible investment firms and public pension funds.*

Montreal $4.5 million over five years to support research in LCA. The International Industrial Chair in Life Cycle Assessment Methodology is now a research unit of the Interuniversity Research Centre for the Life Cycle of Products, Processes and Services (CIRAIG) which includes eight Quebec universities. (Source: ***Globe-Net*****, 9 May, 2007.)**

2.4.3.2 International standards

The best known EMS is the International Standards Organization's 14001 standard, *part of its 14000 series of documents (adopted unchanged by the Canadian Standards Association [CSA]). The first edition dates from 1996; a second edition appeared in 2004. Section 2.3 already annotated a 1995 CSA publication that is intended to assist SMEs in adopting the ISO 14001 standard. Like the ISO 9000 quality management standard, ISO 14001 refers to a firm's processes, not to its products. Nor is certification of a company as conforming to ISO 14001 a guarantee of high environmental standards because there is no minimum standard which must be attained. Rather, there must be a commitment to continuous improvement. Still, in practice, any firm that goes to the trouble of adopting the ISO standard is presumably dedicated to strong environmental performance.*

In contrast, the European Union's Environmental Management and Eco-Auditing Scheme (EMAS), while, like ISO 14001, a voluntary system, does list areas where improvement is mandatory.([19])

As of December 2004, 1492 Canadian companies had obtained ISO 14001 certification, up from 276 in 1999. World-wide as of that date, there were over 90,000 certifications in 127 countries. (Source: Industry Canada, Sustainable Development Strategy 2006-09, *pp. 10-11.)([20])*

Instead of seeking ISO certification, three other options are available. A company may adopt the ISO 14001 standard for internal use only, without going through third-party certification. This avoids an expensive element of the process and is known as self-declaration. Secondly, a firm may seek confirmation of its self-declaration by other parties such as its customers. Or thirdly, one may seek confirmation of one's self-declaration by a party external to the firm. This is what **EnviroReady™** *offers. Launched in 2001 and headquartered in Campbellville, Ontario, its "14000 Registry" recognizes specially trained professional accountants who can issue a Report confirming that a firm's EMS is in conformity with ISO 14001.([21])*

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[19] *Epstein (2008:74), reviewed in section 2.3.2, reports that "EMAS now has over 3,6000 registered organizations."*

[20] *Epstein (2008:74) reports that there are "over 110,000 companies in 138 countries."*

[21] *For further information contact Lynn Johannson at etwom@e2management.com .*

A complementary standard, **Social Accountability 8000 (SA8000)**, *has been developed by* **Social Accountability International (SAI**, *ref.* www.sa-intl.org). *SAI was established in 1997; the standard was last revised in 2001. The SA8000 system covers factory-level management system requirements, independent expert verification of compliance, and more. The Standard elements include child labour, forced labour, health & safety, freedom of association, discrimination, discipline, working hours and compensation. Since its formation, SAI has trained thousands of people in over thirty countries. As of early 2009, almost a thousand facilities were certified worldwide.*

Industry Canada's Corporate Social Responsibility *web site, under* CSR Tools / Management Systems, *provides links to five tools: ISO 9000, ISO 14000, SA8000, Health and Safety Management System (OHSA 18000) and the Global Reporting Initiative (GRI – see section 5.3 below).*

Finally, it should be noted that the ISO is in the process of developing an ISO 26000 Standard on social responsibility. The standard will contain guidelines, not requirements, and will not be used as a management system or certification standard. Both the Global Compact and the Global Reporting Initiative are involved in this ISO development. Canada participates through the Standards Council of Canada. (Source: ***Globe-Net*****, 1 March 2007.)**

2.4.3.3 SME adoption of EMSs

The issue of adoption of an EMS by SMEs has long been of interest. Here are two contributions on the subject from the Commission for Environmental Cooperation:

Commission for Environmental Cooperation, Successful Practices of Environmental Management Systems in Small and Medium-Size Enterprises – A North American Perspective, January 2006, 34 pp.

The report summarizes the sparse literature and experience with introducing EMSs into SMEs, reviews some benefits, drivers and barriers to adoption, and summarizes what technical assistance and incentive programs are available in the NAFTA countries.

Commission for Environmental Cooperation, Improving Environmental Performance and Compliance - 10 Elements of Effective Environmental Management Systems, Montreal, June 2000, 10 pp.

Sets out what Canada, the U.S. and Mexico have agreed is important to address in implementing EMSs, both to comply with environmental laws and to move beyond compliance. To implement this Guidance Document, Environment Canada undertook to post it on its web site but in July 2007 it could not be found there.

Other, mostly older, references:

Johannson, Lynn, "ISO 14001: one for all, or just for some?, *ISO Management Systems*, September-October 2002, pp. 51-56.

Promotes EnviroReady™ as a way to remove barriers to the implementation of environmental management systems by SMEs. (Found on the 14000registry.com web site. The web site also offers a series of undated slides by Johannson on the same subject.)([22])

National Environment Education & Training Foundation, Standardizing Excellence: Working with Smaller Businesses to Implement Environmental Management Systems, Washington, DC, October 2001, 55 pp.

Reports on the result of two workshops in support of an "EMS Assistance Strategy Initiative" aimed at identifying "practical and effective ways to promote, design, and assist small and medium-sized businesses and organizations with implementing an EMS." Discusses incentives and barriers, tools and techniques, and networks, programs and resources. This Initiative is part of the NEETF's "Green Business Network" which "helps businesses of all sizes align environmental performance with business success" and hosts GreenBiz.com. Its newsletter, GreenBuzz, provides online business environmental information.

Richard Starkey, "Environmental management tools - Some options for small and medium-sized enterprises," in Small and Medium-Sized Enterprises and the Environment, Ruth Hillary, editor, Sheffield, Greenleaf Publishing Ltd., 2000, pp. 96-105.

Briefly discusses EMS, Environmental auditing, Environmental indicators, Life-cycle assessment, Environmental labelling, Environmental policies, Ecobalances (a.k.a mass balances or input-output analysis), and Environmental reporting.

Vivian Bertrand, with Tom Conway, "ISO 14000 and Business Strategy: An Annotated Bibliography," prepared for a Conference on ISO 14000 in Beijing, China, October 1996, 58 pp.

One of the themes purportedly addressed is how applicable ISO 14000 is to SMEs but the findings on this score are rather meager: One study simply notes that attaining the standard is harder for SMEs, another expresses the belief that ISO 14000 should be of special interest to SMEs because it combines environmental with business performance.

Two other largely descriptive papers, which also deal with Reporting (to be discussed in Section 5):

Warwick Sangster, SME Uptake of Management Systems Standards, Industry Canada, Sustainable Technologies and Service Industries Branch, July 2005, 52 pp.

Provides an overview table of 16 management and reporting systems and programs, an in-depth discussion of six (ISO 9000, ISO 14000, Ecomapping, Global Reporting Initiative,

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[22] See also **Lynn Johannson, "The Challenge of Implementing ISO14001 for Small and Medium-Sized Enterprises," *Environmental Quality Management*, vol. 7 no. 9 (1997)**, and **Wood and Johansson (2008)**, annotated in section 7.3.1.

Canadian Business for Social Responsibility, and EnviroReady) and one-paragraph summaries of the others (EMAS, CSA, Responsible Care, The Natural Step, the WBCSD, Environmental Choice [part of the Global Ecolabelling Network], the Canadian Council of Ministers of the Environment, the U.K.'s Small Business Standard, Global Compact, and Sustainable Balanced Scorecard).

Melissa Felder, Voluntary Measures: Codes of Environmental Management Practice and Implications for Environmental Sustainability, prepared for Pollution Probe by SummerhillGroup, May 2003, 42 pp.

A critical discussion of ISO 14001, Responsible Care, WBCSD, the Global Reporting Initiative, the CERES Principles and The Natural Step.

2.4.3.4 Analytical studies of EMS adoption

There is, however, more analytical literature on these matters. First, a study on a sample of Japanese firms, probing the reasons why firms adopt an EMS:

Kimitaka Nishitani, "An empirical study of the initial adoption of ISO 14001 in Japanese manufacturing firms," *Ecological Economics*, 2009, pp. 669-679.

The paper reviews 21 empirical studies published between 1991 and 2005. It then uses data for 1996-2004 on 433 manufacturing firms in 16 industries, culled from 1394 firms listed on the Tokyo Stock Exchange.([23])

Probit models seek to explain whether a firm adopts ISO14001 or not. A "Discrete Time Proportional Hazard (DPH)" model seeks to explain the time to initial adoption. Explanatory variables include: export sales as a percent of total; advertising/sales; percent of stock held by financial institutions; percent of stock held by corporate investors; number of employees; Return on Assets; debt/equity; and industry dummies.

While generally good results were obtained, the strongest significance of all is found in the DPH model, where all explanatory variables except the advertising and debt/equity ratios obtain highly significant positive coefficients.

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[23] Except for saying that holding companies and firms with missing data were excluded, the paper does not explain how the sample was chosen. It makes the odd statement: "Although we did not choose the sample randomly, we regard these 433 firms as a random sample of all Japanese manufacturing firms." (p. 675) If their sample represents the sector, then 83% of Japanese manufacturing firms would have adopted ISO14001 by 2004.

Secondly, a large number of publications have been derived from a 2003 OECD Survey of environmental managers in over 4000 firms in seven countries, including Canada. Two aspects – profitability and views of public policy -- will be annotated in sections 4.1 and 7.4 respectively, but a major focus of the survey and the subsequent analyses concerned EMSs. The Survey and this aspect are annotated here.

Publications

Nick Johnstone and Julien Labonne, "Why do manufacturing facilities introduce environmental management systems? Improving and/or signaling performance," ***Ecological Economics*****, vol. 68 (2009), pp. 719-730.**

Julien Labonne, A comparative Analysis of the Environmental Management, Performance and Innovation of SMEs and Larger Firms, for the European Commission, Directorate-General Environment, Final report, 31 August 2006, CL Conseil, Saint Michel Sur Orge, France, 44 pp.

"Comparison of Sample of Facilities with Population," n.d., 6 pp., available on the OECD web site, as are the questionnaire and a glossary of variables. (Ref.: www.oecd.org/env/cpe/firms.)

Irene Henriques and Perry Sadorsky, Environmental Policy Tools and Firm Level Management Practices in Canada, [2004], 35 pp. Available on the OECD web site at http://www.oecd.org/dataoecd/4/61/38781695.pdf .

Nick Johnstone, editor, Environmental Policy and Corporate Behaviour, Edward Elgar & OECD, 2007, 269 pp. In particular, the following chapters:

Chapter 1 - Nick Johnstone, Céline Serravalle, Pascale Scapecchi and Julien Labonne, "Public environment policy and corporate behaviour: project background, overview of data and summary results," pp. 1-33, and Appendix 2, pp. 268-269.

Chapter 2 - Irene Henriques and Perry Sadorsky, "Environmental management systems and practices: an international perspective," pp. 34-70 plus Appendices.

Chapter 7 - Nick Johnstone, "Environmental policy and corporate behaviour: policy conclusions,", pp. 260-265.

The Survey

Labonne (2006) and **Chapter 1 and Appendix 2 in Johnstone (2007)** provide the most comprehensive information about the survey, along with the **"Comparison"** document and, for Canada, **Henriques and Sadorsky ([2004])** Almost 17,000 manufacturing facilities in seven countries (Canada, France, Germany, Hungary, Japan, Norway, and the US) were

sampled in 2003. The samples were drawn from universal population data bases except for the US, where the source was the TRI data base.([24]) The sample was stratified to be representative of sectors at the 2-digit level and in accord with four size categories (50-99, 100-249, 2540-499, and 500+ employees). The 10-page questionnaire was addressed to the "CEO and/or environmental manager" of the facility. The response rate varied considerably, ranging from 9 to 35% (Canada's was 25%).

For three countries, the "Comparison" document shows χ^2 tests for the significance of differences between sample and population. Norway, which had the highest response rate, passes the test for both size and sector distribution. Germany fails the sector test and Japan's sample by size differs significantly from the distribution in the population. For France and Hungary comparative data are shown for firm populations but these lead to no clear conclusions. No data comparison was attempted for Canada and the US.([25])

Labonne (2006: 7) readily admits that the sample may suffer from both sample and selection bias – the latter because good performers are more likely to have responded.

Other weaknesses of the data to be noted are that most responses are qualitative, register perceptions, and reflect responses at just one point in time (Labonne, 2006:7).

Still, this survey captures more SMEs than one finds in many empirical studies – 2855 or 69 %, almost equally divided between the 50-99 and 100-249 size classes.

The Results

Labonne (2006) and **Chapter 1 in Johnstone (2007)** offer extensive descriptive data. We summarize the former because its focus is on the difference between SMEs (with 50-249 employees) and larger firms. The percentage of firms with an EMS in place rises from 25% among firms with 50-99 employees, to 37% in the 100-249 group, 50% in the 250-499 group and 63% in larger firms. Presence of specific environmental practices also rises with firm size.

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[24] However, Henriques and Sadorsky ([2004]) reveal that the initial Canadian sample, consisting of 1033 firms, was drawn from the Dun & Bradstreet data base. The June 2002 Statistics Canada Business Register counted 7539 manufacturing establishments with 50 or more employees. Of the sample's 256 respondents, one-third was listed on a stock exchange. No sample bias would imply that some 2500 manufacturing with 50 or more employees firms were listed.

[25] Henriques and Sadorsky ([2004]) report that, of 256 valid Canadian responses, 59 or 22% had 50-99 employees. Statistics Canada's Business Register data suggest that this category comprises 50% of employer establishments in Manufacturing.

Labonne then explores four questions with probit and Poisson regressions: the decision to implement an EMS, how many concrete actions are undertaken to reduce environmental impacts, cleaner production vs. end-of-pipe solutions, and the decision to invest in environmental R&D.

If SMEs were part of a multi-facility firm, they were more likely to have adopted an EMS. SMEs were also more susceptible to do so under the influence of buyers, when competition is based primarily on quality of the product, when public authorities provide information or a financial or regulatory incentive, when they have been profitable over the previous three years, or when they face a performance-based standard. None of these relationships are found among larger firms.

SMEs are more likely to have undertaken concrete actions when they were part of a multi-facility firm, have undergone more frequent inspections, are facing performance standards or pollution taxes, when they have been profitable over the previous three years, or when governments offer technical assistance; if they mainly compete on price they tend to have taken fewer actions. Again none of these relationships are found in the larger firm sample.

Fewer significant results unique to SMEs are obtained for the other two questions. They include that SMEs are less likely to adopt clean production processes when they face a technology-based standard; and that having implemented an EMS increases the likelihood that the firm will engage in environmental R&D, as does the presence of technical assistance.

Chapter 2 in Johnstone (2007) provides an equally rigorous analysis, again employing probit models to answer the question why a facility adopts an EMS and why it opts for certification, and a Poisson regression to explore what influences how comprehensive the EMS is. ([26]) But instead of using split samples, the number of employees is simply one of the many explanatory variables.([27])

Likelihood of adoption of an EMS increases with the number of employees, export orientation, presence of an environmental R&D budget, if corporate headquarters and workers are perceived to exert a strong influence, if the facility has a quality management system in place, if natural resource use is perceived to have a strongly negative environmental impact, if the company is listed on a stock exchange, and if there are regulatory incentives to adopt an EMS. On the other hand, the stronger the perceived influence of public authorities, and if technical assistance is offered, the likelihood of adopting an EMS goes down,

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[26] A fourth question is what influences a facility to have an individual explicitly responsible for environmental concerns.

[27] Both Labonne (2006) and Chapter 2 in Johnstone (2007) also include dummies for the country and for aggregates of sectors.

according to these results. (The authors suggest that the latter result means that technical assistance is seen as a substitute for adopting and EMS.) Profitability over the last three years, influence by buyers or NGOs, frequency of inspection, whether the head office is in the same country as the facility or not, and whether voluntary agreements are perceived as important obtained no significant loadings. Of the country dummies (relative to the US), Japan and Norway gained significance, as did five of the seven industry dummies.

Results for the other questions are largely similar, except that, with regulatory incentives present, the likelihood of certification is found to be less – a result that receives no comment.

Because over one-third of the respondents were from Japan, the authors reran all the regressions without the Japanese data. They found that the results did not materially change.

Johnstone and Labonne (2009) perform a similar analysis, but with the added hypothesis that certifying one's EMS (as opposed to only adopting it) may serve as a signal to regulators and corporate buyers. They also run their probit regressions for each size class (50-99, 100-249, and 250+ employees) – a 3-way split compared to the 2- to 4-way split used by Labonne (2006). The results indicate that, for small facilities, frequency of inspections and profitability are most important in explaining adoption of an EMS. Signaling to regulators and supply partners matters primarily for the largest facilities.([28])

Comment

The data are not a random sample of manufacturing industries in the seven countries; there is clear evidence of both sample and response bias. E.g., 37% of the sampled facilities had an EMS in place, and 2/3 of those were ISO14001-certified (24% of the total sample of 4186 facilities; Johnstone [2007:14]). This would suggest a very strong overrepresentation of such firms.([29])

Still, the sample is large and contains many SMEs, and responses to the questions, though reflecting perceptions and largely qualitative, are wide-ranging. In analyzing the results, theorizing is mostly *ad hoc* and all available variables tend to be thrown in every model. An analysis by size-class appears to lead to more insightful results than one that simply inserts the number of employees into the equations.

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[28] There are several discrepancies between the write-up and the results reported in the tables. E.g., selling to other firms is said to also be important for medium-sized firms but the corresponding p-value is 0.300; provision of financial assistance is said to be important for small firms but the corresponding p-value is 0.190.

[29] Similarly, among Canadian respondents, 81 of 256 reported having an EMS in place and of these, 47 were ISO14001-certified (or 18% of all respondents). Compare this with data cited earlier in this section that, as of December 2004, across all sectors of the economy, only 1492 firms were so certified, out of some 45,000 establishments with more than 50 employees.

See also:

"Environment Compliance: Channels of Enforcement: Presentation by Nick Johnstone and Pascale Scapecchi, National Policies Division, OECD Environment Directorate, at GFSD Conference on Economic Aspects of Environmental Compliance Assurance, 2-3 December 2004, OECD, Paris, 15 slides (available on the OECD web site).

Uses a probit model to ask what role is played by the public policy context, stakeholders or self-enforcement in explaining why firms have taken action to combat air or water pollution in the previous three years. Finds that perceived policy stringency and frequency of inspections are very significant, as is the influence of their workers. The significance of various aspects of self-enforcement is more spotty.

And in Johnstone (2007):

Chapter 4 - Toshi H. Arimura, Akira Hibiki and Nick Johnstone, "An Empirical Study of Environmental R&D: What Encourages Facilities to be Environmentally-Innovative? ", pp. 142-173, originally published as OECD paper ENV/EPOC/WPNEP(2005)10, April 2005, 26 pp.,

Tests narrow, weak and strong versions of the Porter Hypothesis that public environmental policy can increase incentives for innovation. Finds support for the hypothesis, especially if the policy instruments are flexible.

Chapter 5 - Manuel Frondel, Jens Horbach and Klaus Rennings, "End-of-Pipe or Cleaner production? An Empirical Comparison of Environmental Innovation Decisions Across OECD Countries," pp. 174-212, originally published as OECD paper ENV/EPOC/WPNEP(2005)9, April 2005, 31 pp.

Finds that cost savings tend to favour cleaner production, while end-of-pipe measures tend to correlate with strong environmental (regulatory) policy. Environmental innovation tends to be similar to process innovation.

An earlier limited-scope study:

M. Alberti, L. Caini, A. Calabrese and D. Rossi, "Evaluation of the costs and benefits of an environmental management system," *International Journal of Production Research*, vol. 38, no. 17, (2000), pp. 4455-4466.

An early taxonomy of the costs and benefits of ISO 14000 implementation, based on 14 of 160 large or medium-sized chemical firms in Italy that were certified by late 1999. Quantifiable costs are found to range between 0.5 and 1.5% of sales and up to 15% of investments. Quantifiable benefits include a 2.4% reduction in rejects and 5 to 100% reduction in waste. Non-quantifiable benefits are also discussed. The two main drivers of adoption of an EMS are suggested to be actual environmental risk and importance of the company image.

One may conclude from this discussion of EMSs and the earlier one on Guides that, for small firms, improving performance can be achieved using guidelines such as those in Johannson (2007), reviewed in section 2.3.1. Adoption of a formal EMS becomes more attractive the larger the firm, is more likely to happen if the firm is profitable and, as we'll see in section 7.3.2, if there is effective regulation.

2.4.3.5 Sustainable product development

Taking environmental standards several steps further is work coming out of Sweden, with an affinity to Natural Step philosophy. Sophie Hallstedt (formerly using the name Byggeth) submitted her doctoral dissertation for the Department of Mechanical Engineering (School of Engineering, Blekinge Institute of Technology) as a collection of six mostly published papers, the result of ten years of research:

Sophie Hallstedt, A Foundation for Sustainable Product Development, Doctoral Dissertation Series No. 2008:06, Department of Mechanical Engineering, School of Engineering, Blekinge Institute of Technology, 216 pp.

The work proposes "a new general Method for Sustainable Product Development" and also "a Template for [a] Sustainable Product Development approach." The research has found that support for sustainability-related decisions is not yet integrated in companies today but that creating "generic methods and tools" in aid of such integration is possible. The use of guiding questions avoids the need for detailed rules and prescriptive guidelines.

The thesis is available from the author. Below are the bibliographical references to the six papers. They have telling titles!

Paper I

Byggeth S.H. and Broman G.I. 2001. Environmental aspects in product development - An investigation among small and medium-sized enterprises, in: *Proceedings of SPIE, Environmentally Conscious Manufacturing*, Surendra M. Gupta, Editor, vol. 4193, 261-271. ISBN: 0-8194-3858-8.

Paper II

Byggeth S. H. and Hochschorner E. 2006. Handling trade-offs in Ecodesign tools for sustainable product development and procurement. *Journal of Cleaner Production,* vol. 14, issue 15-16, 1420-1430.

Paper III

Byggeth S. H., Broman G. and Robèrt K.-H. 2007. A method for sustainable product development based on a modular system of guiding questions. *Journal of Cleaner Production*, vol. 15, issue 1, 1-11.

Paper IV

Ny H., Hallstedt S., Robèrt K.-H. and Broman G. 2008. Introducing templates for sustainable product development through an evaluation case study of televisions at the Matsushita Electric Group. *Journal of Industrial Ecology* (In press).

Paper V

Byggeth S.H., Ny H., Wall J., Broman G. and Robèrt K.-H. 2007. Introductory procedure for sustainability-driven design optimization, in: *Proceedings of the International Conference on Engineering Design, ICED' 07*, Cite des Sciences et de l'Industrie, Paris, France, 28-31 August. ISBN 1- 904670-02-4.

Paper VI

Hallstedt S., Ny H., Robèrt K.-H. and Broman G. 2008. An approach to assessing sustainability integration in strategic decision systems. Submitted for publication.

2.4.3.6 Industry-specific standards

Several of the industry-specific frameworks for increased sustainability discussed below in Section 3 could also have been categorized here, under the rubric of standards – the distinction is somewhat arbitrary in the case of, for example, Responsible Care® and FPAC's certification condition for membership.([30]) Two other industry-specific standards deserve mention here:

- *The* **Leadership in Energy and Environmental Design (LEED®)** *Green Building Rating System™ is a "benchmark for the design, construction, and operation of high performance green buildings," an initiative of the US Green Building Council, also adopted by the* **Canada Green Building Council** *(ref.* **www.cagbc.org***). Over 500 Canadian projects are currently registered.*

- *The* **Climate, Community and Biodiversity Alliance** *(ref.* **www.climate-standards.org***) brings together leading companies, NGOs and research institutes to promote integrated solutions to land management. It has developed "CCB Standards" and, in February 2007, had certified two forestry projects under its Standards.*

2.4.4 Carbon pricing ([31])

2.4.4.1 Cap-and-trade

Great hope for a more sustainable way of conducting business is placed in the institution of a cap-and-trade system for CO_{2e} emissions and the practice of off-setting carbon production by investing in carbon-reducing projects. The general idea is that government imposes a cap, typically on large emitters, allowing them to emit quantities up to the amount specified in the cap. Companies that emit more can trade credits with others that emit less. The result is a), that specified targets of emission quantities are met and b), that they are met in the most cost-effective manner. Violators typically face hefty fines.

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[30] *The same case can be made for general guidelines such as The Natural Step, discussed in section 2.2.*

[31] The NRTEE's most recent report on carbon pricing is **Achieving 2050: A Carbon Pricing Policy for Canada (Advisory Note), 2009, 121 pp.** It arrived too late for annotation. See section 2.4.4.3 below for a reference to the NRTEE's 2008 report.

Cap-and-trade can be applied to a variety of undesirable products. A well-known example is sulphur dioxide emissions trading to combat acid rain, inaugurated by the 1990 U.S. Clean Air Act. Under this program, SO_2 emissions are expected to be reduced by 50% from 1980 levels by 2010.

Richard Schmalensee a.o., "An Interim Evaluation of Sulphur Dioxide Emissions Trading," *Journal of Economic Perspectives*, Vol. 12, No. 3 (Summer 1998), pp. 53-68.

Less than three years after the 1995 start of the Acid Rain Program, Prof. Schmalensee could already conclude that the system was working very well and that cap-and-trade is a policy tool superior to command-and-control.

A. Denny Ellerman, Paul L. Joskow, and David Harrison, Jr., Emissions Trading in the U.S.: Experience, Lessons and Considerations for Greenhouse Gases, prepared for the Pew Center for Climate Change, May 2003, 57 pp.

The paper puts cap-and-trade in the wider context of emissions trading programs.([32]) Reviews six US trading schemes, including the Acid Rain Program, and draws from them five general lessons including: emissions trading has significantly reduced the cost of meeting emission reduction goals; it does not compromise the achievement of environmental goals; and inter-temporal trading (banking) improves program performance. Argues that GHG emissions trading is particularly well-suited for an emissions trading application.

Another recent application is the State of Illinois's trading program for volatile organic compounds, inaugurated in 1997 in most of the Chicago area. Since 2000, over 100 major sources of pollution in 8 Illinois counties have begun trading pollution credits through the Emissions Reduction Market System.

The largest carbon trading system to date is the European Union's Emissions Trading Scheme, *inaugurated in 2005 and so far the world's only mandatory carbon trading system. The collapse of the market in 2007 (in August the price of carbon reached €0.08/tonne, from €30 in 2006) illustrates the practical problems with this theoretically ideal (free-market) solution to the CO_2 emission reductions challenge. The market collapsed when it became clear that many states had issued permits that were far too generous. A second phase of the Scheme is to start in 2008 and will cover all GHGs, not only CO_2, as well as emissions from the aviation industry.*

A few references on the EU Scheme:

Darren Samuelsohn, "Lessons from E.U. cap-and-trade woes: 'You need a registry'," *Greenwire*, 9 May 2007.

Quotes EU officials as saying that they had not spent enough time collecting and verifying historical pollution data. Notes that the US Supreme Court, in April 2007 (Massachusetts v. EPA) has determined that the

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[32] The theoretical proposition may be traced back to **Ronald H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, vol. 3 (October 1960), pp. 1-44** and, later, **J.H. Dales, Pollution, property and prices: An essay in policy-making and economics, University of Toronto Press, 1968.** (References found in Ellerman et al.)

Environmental Protection Agency has the authority to regulate GHGs under the *Clean Air Act*. In the mean time, states are forging ahead with collecting data: The Climate Registry now has 31 states as members of a system that will use uniform measurements of GHG emissions starting in January 2008.

Commission of the European Communities, "Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading system of the Community," 23 January 2008, 51 pp. (Download from http://www.ec.europa.eu/environment/climat/emission/ets_post2012_en.htm .)

Alberta is the first jurisdiction in North America to impose GHG cuts on large industrial facilities: Effective July 1, 2007, the Climate Change and Emissions Management Amendment Act *imposes reductions in GHG emissions intensity of 12% on facilities that emit more than 100,000 tonnes per year. Industries have three options to achieve the reductions: Make operating improvements; buy credits from large Alberta emitters that have reduced their intensity beyond the 12% target or from other facilities in Alberta that are voluntarily reducing their emissions;([33]) or pay $15/tonne into a Climate Change and Emissions Management Fund, proceeds of which are earmarked for climate change-related projects. (Source:* **Government of Alberta news release, 27 June 2007**.*)*

B.C. , Manitoba, Ontario, Quebec and seven US states (including California) are participating in the Western Climate Initiative (WCI), *which is designing a cap-and-trade system for major emitters. Saskatchewan and five other US states are observers to the Initiative. In March 2008, the Pembina Institute offered some free advice to the negotiators:*

Matt Horne, Cap and Trade – Reducing Pollution, Inspiring Innovation, Pembina Institute, March 2008, 23 pp.; Fact Sheet, 4 pp.

Recommends adherence to four key principles: 1) the caps should be at least 33% below 2007 levels by 2020, with annual caps to achieve that target; 2) the system should at least cover large industries and aviation; 3) all permits should be auctioned off; 4) to maintain integrity of the system, strict conditions should be imposed on the use of offsets and there should be no price caps.

The WCI unveiled its initial proposal in July 2008; it did not meet all of Pembina's expectations. (Sources: **Josh Wingrove, *Globe and Mail*, 24 July 2008**; and **Pembina Institute media release, 28 July 2008**.*)*

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[33] *Producers whose emission reductions can be traded for credit include farmers who use the no-till method for seeding. Source:* **David Ebner, *The Globe and Mail*, 26 February 2008**. *The article names three brokerage businesses in Alberta that are beginning to deal in credits from farming, biomass and renewable energy. On* **20 May 2008, Richard Blackwell** in ***The Globe and Mail*** *reported that, according to preliminary figures, Alberta companies had cut emissions by 1.6 million tonnes, had purchased 1 million tonnes in offsets and had paid $40 million into the provincial technology fund to cover 2.7 million tonnes of emissions.*

In September 2008, ten states in the US Northeast launched their own cap-and-trade emissions scheme, called the Regional Greenhouse Gas Initiative. *The market is intended to start in January 2009 and is aimed at the region's 233 fossil fuel power plants. (Source:* **Timothy Gardner, *Reuters*, 23 September 2008.***)*

The global carbon market more than doubled in value in 2007 compared to 2006, to $64 billion. Of that amount, $50 billion was through the EU's Emissions Trading Scheme, the remainder under Kyoto schemes (Clean Development Mechanism and Joint Implementation). (Source: **Vera Eckert and Michael Szabo, *Reuters*, 7 May 2008.** *See also* **Shawn McCarthy, *Globe and Mail*, 14 May 2008** *and* **Michael Szabo, *Reuters*, 21 August 2008.***)*

In December 2007, the **International Accounting Standards Board** *activated a project to develop comprehensive guidance on accounting for emissions trading schemes. (Ref.:* www.iasb.org.*)*

2.4.4.2 Voluntary off-sets

Closely related to emissions trading is the increasingly popular practice of carbon off-setting. Any business, or anyone, can mitigate their carbon production by voluntarily paying towards projects that mitigate against climate change. Typical projects are tree planting and renewable energy projects.

The **Chicago Climate Exchange** (ref.: www.chicagoclimatex.com/), *a voluntary but legally binding GHG reduction and trading system for emission sources and offset projects in North America and Brazil, has more than 350 members including Ford, DuPont, Motorola, the cities of Oakland and Chicago, Tufts University, the University of Minnesota, the National Farmers Union and the Iowa Farm Bureau. Members joining the Exchange commit to reducing their aggregate emissions of six greenhouse gases by 6% by 2010 and performance is independently verified. Trading started in 2003. To date the Exchange has an aggregate baseline of 226 million metric tons of CO_{2e}, which is as much as the UK's annual allocation under the EU Scheme, or 4% of US annual GHG emissions. (Source: Wikipedia.) In 2007 22.9 million tonnes of CO_{2e} were traded.*

There is also a **Japan Voluntary Emissions Scheme.** *It was launched in May 2005 and began trading in October 2006 (ref.:* www.kyomecha.org/e/info04.html *).*

Carbon off-setting has become all the rage for all manner of businesses. Without verification and market discipline, its true value is being questioned. That motivated The Climate Group ([34]) and others to launch, in November 2007 at the London Stock Exchange, a **Voluntary Carbon**

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[34] *More on The Climate Group in section 5.5 below.*

Standard *(ref.:* www.v-c-s.org*).*[35] *The "rigour and transparency" of this Standard is expected to "boost market confidence" of companies and individuals who want to go carbon-neutral. To qualify under this standard, an offset has to have happened, must be incremental, measurable, permanent, independently verified and can be used only once. In March 2009 VCS launched its global registry and project database system. Three international companies are contracted to act as VCR Registries.*

Some recent discussion of and references on offsets:

Ashley Ahearn, "Carbon-Offset Cowboys Let Their Grass Grow – Ranchers in Montana are being paid by polluters to keep their grass unmowed," *Scientific American*, Special Edition, 5 January 2009.

EcoSecurities and ClimateBiz, Carbon offsetting trends survey 2008, [24 Sep 2008], 27 pp.

Ecosystem Marketplace and New Carbon Finance, Forging A Frontier – State of the Voluntary Carbon Markets 2008, 8 March 2008, 79 pp.

Ecosystem Marketplace and Business for Social Responsibility, Offsetting Emissions: A business Brief on the Voluntary Carbon Market, Second Edition, February 2008, 16 pp.

Joshua S. Gans, "Do Voluntary Carbon Offsets Work?" *Economists' Voice*, October 2007, 4 pp. (Available at www.bepress.com/ev)

"Morgan Stanley, Det Norske Veritas launch Carbon Bank," *GreenBiz.com*, 16 August 2007.

Martin Mittelstaedt, "The great carbon conundrum," *The Globe and Mail*, 14 July 2007. Also with articles by Eric Reguly and Richard Blackwell.

"Searching for true Carbon offsets," *Globe-Net*, 5 July 2007.

"Google to offset all CO2 emissions by end of year," *Greenwire*, 20 June 2007.

Fiona Harvey, "Beware the carbon offsetting cowboys," *Financial Times*, 26 April 2007.

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[35] *See* **The Climate Group, WBCSD and IETA, "New Carbon Standard Guarantees Environmental Integrity and Transparency for Global Offset Market," WBCSD press release, 19 November 2007.**

2.4.4.3 Carbon tax

An alternative approach to cap-and-trade schemes is imposition of a carbon tax, *that is, rather than regulate quantities and let the market determine the price of carbon, government imposes a price and expects behaviour (lowering carbon emissions) to change accordingly. The theoretical drawback of this approach is that the desired outcome – reduced emissions – is not certain. In practice, governments are likely to introduce a range of policies, including both trading and tax measures. Just like it took financial markets decades to become as integrated as they are today, some time will pass until institutions have developed sufficiently for a global carbon market to function effectively.*

In February 2007, a Canadian group, **Sustainable Prosperity** *was formed comprising "business leaders, academics, environmentalists, government representatives, pollsters and policy change experts." (Ref.:* www.sustainableprosperity.ca/*), The group is chaired by Professor Stewart Elgie and its secretariat is at the Institute of the Environment at the University of Ottawa. The goal is to research and promote "Environmental Pricing Reform." In April 2008, Jack Mintz and Nancy Olewiler prepared for the group:*

Jack Mintz and Nancy Olewiler, A Simple Approach for Bettering the Environment and the Economy: Restructuring the Federal Fuel Excise Tax, Sustainable Prosperity, April 2008, 32 pp.

The authors calculate that the current federal excise tax of 10 cents/litre for gasoline and 4 cents/litre for diesel) is the equivalent of a carbon tax of $42/tonne of CO_2. They propose to apply this tax to all fuels. This would raise an additional $12 to 15 billion in tax revenues (current revenues from the excise tax are $5.1 billion), allowing corporate and personal income taxes to be lowered by eight to ten percent (as in B.C., the lowest brackets would be cut most). Such a tax shift could be combined with a cap-and-trade system for large emitters (their emissions account for about half of total emissions).

The paper was written on the tenth anniversary of the 1998 Report of the Technical Committee on Business Taxation which was chaired by Jack Mintz.

(Media coverage: **Nathan VanderKlippe** in the ***Financial Post*** of **9 April 2008**; **Martin Mittelstaedt** in the ***Globe and Mail*****, 10 April 2008**.)

Quebec, in June 2007, took a first step in the direction of a carbon tax, be it a very minimal one. The tax came into effect on October 1, 2007 and added 0.8 cents to the price of every litre of gasoline and 0.9 cents to a litre of diesel.

The B.C. government's February 19, 2008 Budget introduced the first significant carbon tax in North America, balanced by reductions in personal and corporate income taxes. A tonne of carbon-equivalent emissions will be taxed $10.00 as of July 1, 2008, rising to $30.00 by 2012;

that translates into an increased price at the pump of 2.41 cents/litre, rising to 7.24 cents in 2012.([36])

A few other recent references on a carbon tax and alternative approaches to reducing GHG emissions:

- **Thomas J. Courchene and John R. Allan, "Climate Change: The Case for a Carbon Tariff/Tax,"** ***Policy Options*****, March 2008, pp. 59-64**. Also in **"How to make free riders pay? Carbon tariffs,"** ***The Globe and Mail*****, 17 March 2008, p. A13**. Distinguishes two types of free-rider problems: Firms in non-complying countries have an advantage in exporting to world markets; and firms in complying countries have an incentive to outsource to non-complying countries. The solution is to augment a domestic carbon tax with a 'carbon tariff' on imports and a tax remission on exports.

- **National Round Table on the Environment and the Economy, Getting to 2050: Canada's Transition to a Low-emission Future - Advice for Long-term Reductions of Greenhouse Gases and Air Pollutants, 7 January 2008, 78 pp.** The report's central recommendation is that an economy-wide price signal for carbon emissions should be established as soon as possible, whether it be through an emissions tax, a cap-and-trade system, or a combination of the two.

  (Media coverage: **Jeffrey Simpson,** ***The Globe and Mail*****, 8 January 2008**; ***Globe and Mail*** **editorial, 8 January 2008**; **Mark Jaccard,** ***The Ottawa Citizen*****, 10 January 2008, p. A11.** [Prof. Jaccard is an NRTEE

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[36] *See also:*

- **Pembina Institute, media release, 26 June 2008.** *Also* **Backgrounder, 5 pp.**
- **Clive Mather, Nancy Oleweiler and Stewart Elgie,** ***The Globe and Mail*****, November 29, 2007**
- **The Legislative Assembly of British Columbia, Report on the 2008 Budget Consultations, Select Standing Committee on Finance and Government Services, First Report, 3rd Session, 38th Parliament, November 15, 2007, "Discouraging Greenhouse Gas Emissions."**

In April/May 2008, the Pembina Institute commissioned a poll of 1007 Canadians asking whether they see this B.C. tax as a positive or negative step. Seventy-two percent felt it was a very or somewhat positive step, with little variation across the country, though support was highest in Quebec and the Atlantic provinces; lowest approvals, still at 58%, were in Vancouver. Support was also fairly even between men and women and across age classes. Asked, if the federal government were to implement a carbon tax, how the revenue should be spent, only 11% opted for a reduction in income taxes; the largest vote went to "Renewable energy like wind and solar power." (Source: **Pembina Institute media release, 26 May 2008***;* **Mike De Souza,** ***Canwest News Service*****, 26 May 2008** *and additional breakdowns obtained from Matthew Bramley of the Pembina Institute.)*

Member.])

- **Corporate Knights, Option: 13 – White Paper: Three choices for 2013 and beyond in the face of climate change, December 11, 2007 version available on www.option13.org .** The October 11 version was published in *Corporate Knights*, Vol. 6, Issue 2 (Cleantech issue), pp. 17-19. The paper advocates a harmonized global price for carbon.

- **David G. Victor and Danny Cullenward, "Making Carbon Markets Work (extended version) – Limiting climate change without damaging the world economy depends on stronger and smarter market signals to regulate carbon dioxide," *Scientific American*,** on-line release of September 24, 2007, in advance of publication in the December issue.

- **"Let's get serious about carbon tax," *The Gazette*, 9 June 2007.**

2.4.5 Sustainable Consumption and Production

A final general concept in conducting business in a more sustainable manner is one that connects the dots: Not only production but also consumption must become more sustainable if humanity is to meet the SD challenge. There will be much to note on this in Section 7 because Sustainable Consumption and Production is an area where governments play a lead role. But we cite here one publication from the WBCSD:

WBCSD, Sustainable Consumption Facts and Trends – From a business perspective, The Business Role Focus Area, November 2008, 40 pp.

The Foreword to this report contains a "statement of intent" that includes the words:

> Current global consumption patterns are unsustainable. Based on the facts and trends outlined in this document, it is becoming apparent that efficiency gains and technological advances alone will not be sufficient to bring global consumption to a sustainable level; changes will also be required to consumer lifestyles, including the ways in which consumers choose and use products and services.

It then reviews the global drivers of consumption (population growth, middle-class lifestyle growth, consumerism among the affluent), global consumption patterns and their impact, and the role of the consumer. The role of business is seen as falling in one of three categories:

- *innovate* by developing new and improved products, services and business models that maximize societal value at minimum environmental cost;
- *influence choices* through marketing and awareness-raising campaigns;
- *edit choices*: remove 'unsustainable' products, in partnerships with other actors.

Illustrations with graphs and vignettes of specific company initiatives are found throughout. The report stresses in conclusion that "Sustainable consumption is a systemic challenge."

Sidebar 2 Barriers encountered by SMEs against adoption of more sustainable practices

The literature cites a long list of reasons why smaller firms have difficulty adopting sustainable practices. They include:

- *business owners' feeling that they are too small to matter;*
- *limited financial resources;*
- *limited human resources (skills, training);*
- *short-term, day-to-day survival orientation;*
- *fear that voluntary initiatives will put them at a competitive disadvantage;*
- *lack of awareness of the benefits;*
- *perception of high cost of implementation, that solutions are complex;*
- *lack of awareness of available assistance.*

In addition, SMEs tend to have limited exposure to external pressures that might otherwise induce them. They may be operating below the radar of regulatory authorities. Some may fear that acting would expose them to regulatory scrutiny. Others may not be aware of regulatory requirements.

The 2007 survey by the Canadian Federation of Independent Business (CFIB) found that SMEs consider the lack of information, the expense, and the complexity of the task to be the greatest barriers to "doing even more."

Revell and Rutherfoord (2003) point the finger to government policies. They contrast the UK approach of reliance on providing information and voluntary responses with that of the Dutch government which relies more on consensual governance and cross-sectoral targeting of small firms.([37])

References:

- **CFIB (2007),** pp. 9-15, further annotated in sections 2.1 and 7.4.

- **Biehl and Klassen (2005)**, pp. 40-43. Annotated in section 3.11.

- **Jesus Ángel del Brío and Beatriz Junquera, "A review of the literature on environmental innovation management in SMEs: implications for public policies," *Technovation*, vol. 23 (2003), pp. 939-948.**

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[37] *The same point is made in* **Rutherfoord et al. (2000)**, *annotated in section 7.4.*

- **Andrea Revell and Robert Rutherfoord, "UK environmental policy and the small firm: broadening the focus,"** ***Business Strategy and the Environment*****, vol. 12 (2003), pp. 26-35.**

- **National Environment Education & Training Foundation, Standardizing Excellence: Working with Smaller Businesses to Implement Environmental Management Systems, Washington, DC, October 2001, 55 pp.,** p. 10.

- **Agneta Gerstenfield and Herwitt Roberts, "Size Matters - Barriers and prospects for environmental management in small and medium-sized enterprises," in Small and Medium-Sized Enterprises and the Environment, Ruth Hillary, editor, Sheffield, Greenleaf Publishing Ltd., 2000, pp. 106-118.**

On the other hand, smaller firms are more flexible in how they operate, compared to large, bureaucratic businesses. As well, several of the perceptions noted above may be unfounded. For example:

- **Johannson (2005, 2007),** *cited in section 2.3.1, provides numerous examples of changes in practices that are easy to implement.*

- **Hobbs, J., "Promoting cleaner production in small and medium-sized enterprises," in Small and Medium-Sized Enterprises and the Environment, Ruth Hillary, editor, Sheffield, Greenleaf Publishing Ltd., 2000, pp. 148-157.**

  Asserts (p. 155) that experiences in cleaner production programs indicate that 20% of reductions in pollution can be achieved at low or no cost in most SMEs and that another 10 to 20% reduction can be achieved with investments that have a payback period of less than six months. *Comment*: While this points to significant low-hanging fruit, it does also suggest that serious investments need to be made to achieve the remaining 60-70%.

- **Castka et al. (2004),** *reviewed in section 5.1 below, finds that barriers cited by SMEs in the UK "tend to be built on perception rather than reality."*

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SECTION 3 More Sustainable Business Conduct – Industry-specific Analyses and Solutions

3.1 Chemical industry

Many believe that, to get down to practical solutions, one needs to address issues specific to a particular industry. One of the first and most successful industry-led initiatives is Responsible Care® *by the Canadian Chemical Producers' Association (ref.* www.ccpa.ca*). The program was initiated in 1985, in response to public concerns over chemicals and their impact on human*

health and the environment.([38]) It has now been adopted in over 50 countries. (The international version goes under the name "Responsible Care Global Charter.") The CCPA's 14th report was issued in 2007:

Canadian Chemical Producers' Association, Reducing Emissions - 2005 Emissions Inventory, 2007.

The CCPA's 60 members comprise 90% of Canada's chemical producers. Adherence to the Responsible Care® program is a mandatory condition of membership. The program covers the management of chemicals throughout their life cycle as well as companies' social responsibility through six guiding principles and associated codes of practice. Companies are re-verified every three years by verification teams consisting of third party industry experts and public representatives including nearby residents; verification reports are made public. The CCPA also has, led by an independent facilitator, a National Advisory Panel of 12 or more stakeholders representing a wide range of interests. (Information gleaned from Five Winds International & Strandberg Consulting [2007], referenced in section 3.21 below.)

See also:

- Appendix 3 (# 3.8) in **Blackburn (2007)**, p. 691. *Responsible Care® is said here to have "ISO-like management standards and that, for US members, a combined certification process with ISO 14001 is available. (A full annotation of Blackburn (2007) is in section 2.3.2.)*

- **Gunningham & Sinclair (2002)**, p. 25, *notes that under the Responsible Care® product stewardship code of practice, "larger enterprises have taken steps to influence the behaviour of SMEs through the practice of product stewardship or 'cradle-to-grave' policies." (A full annotation of Gunningham & Sinclair (2007) is in section 7.3.1.)*

Initiatives or analyses pertaining to other industries follow in alphabetical order.

3.2 Banking

(Please also refer to capital market practices in section 6.4.)

In 2002, the Climate Change Working group of the UNEP Finance Initiative published a two-part report, authored by Innovest, and a CEO Briefing:

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[38] *The gas leak in Bhopal, India, took place on December 3, 1984. The methyl isocyanate (MIC) killed 2500 to 5000 people.*

Innovest, Climate Change & The Financial Services Industry - Module 1 – Threats and Opportunities, July 2002, 29 pp.
Innovest, Climate Change & The Financial Services Industry - Module 2 – A Blueprint for Action, July 2002, 50 pp.
UNEP Finance Initiative, Climate Change Working Group, Climate Change and the Financial Services Industry, CEO Briefing -, 26 September 2002, 8 pp.

Accepting the science of climate change, Module 1 and the CEO Briefing set out the resulting threats to the economy and all segments of the insurance and finance sectors, and the opportunities that arise from same.

Module 2, in a chapter entitled "What Are Financial Institutions Actually Doing?" divides firms in the sector into four groups: those Unaware, the "Wait and See" group, Proactive companies, and Leaders. The report then states:

> Our research indicates that most mainstream financial institutions can be categorized as being *Unaware* of the climate change issue or as having adopted a *Wait and See* attitude. These firms are content to concede any first mover advantages in preference to learning from others' experiences and becoming better educated in the meantime. However, a small handful of companies are considered to be either *Proactive* or even as sector *Leaders*, depending on the extent to which they have developed and operationalized strategies based on climate change and the GHG markets.

Another chapter identifies various barriers to more widespread response. Not surprisingly, the top recommendation is to raise awareness, within and outside the finance sector.

Fifty-two organizations provided input to the report, of which three were from Canada (the Canadian Institute of Chartered Accountants , OMERS and the Royal Bank).

That was in 2002. On June 5, 2007, under the aegis of the **UNEP Finance Initiative**, *23 CEOs of some of the world's largest finance organizations signed a* **Declaration on Climate Change (3 pp.)** *It speaks of the potential for "grave social and environmental harm;" of, since 2002, a "seismic shift in how climate change is perceived;" and it commits to quantifying and integrating climate change risks and opportunities into their core financial operations. The sole Canadian signature on this Declaration is by the CEO of the B.C. Investment Management Corporation (ref. www.bcIMC.com).*

The most recent assessment of the state of affairs in the banking sector was published by CERES:

Douglas G. Cogan, Megan Good and Emily McAteer, Corporate Governance and Climate Change: The Banking Sector, A Ceres Report, January 2008, 58 pp.

Also reported on by ***The Economist*, 15 March 2008** and **Rachelle Younglai, *Reuters*, 10 January 2008.**

The authors are with the Climate Change Research Team of RiskMetrics Group.([39]) The Group's generic Climate Change Governance Checklist was adapted for the banking sector (and further adapted for two subsectors) by giving greater weight to board and management strategies, and less to GHG emissions and accounting. Forty banking institutions (including investment banks and asset managers) were then scored and best practices were identified.([40]) The 4-page profile of the overall winner, HSBC Holdings PLC, with 70 out of 100 points, is provided in an Appendix and profiles of all 40 are available on the CERES web site. The three Canadian banks, all in the Diversified Banks subsector, are: the Royal Bank (which earned 49 points), Scotiabank (26) and TD Bank (25). Scores in this subsector ranged between 70 and 4.

The 14-point checklist covers board oversight, management execution, public disclosure, emissions accounting, and strategic planning. An Appendix provides further description of the criteria.

Comment: On what basis the 40 institutions were chosen is not revealed. The assignment of scores is clearly a qualitative exercise. The integration of climate change-related policies in day-to-day business is sparsely represented in the criteria. The report's prime benchmarking merit lies in the description of best practices, rather than in the relative scores.

Here is a recent assessment by the North American Task Force of the UNEP Finance Initiative:

UNEP Finance Initiative, North American Task Force, Green Financial Products and Services – Current Trends and Future Opportunities in North America, a report by ICF Consulting Canada, August 2007, 84 pp.

UNEP Finance Initiative, North American Task Force, Green Financial Products and Services – Current State of Play and Future Opportunities, CEO Briefing, October 2007, 8 pp.

The report is the result of a scan of 35 financial institutions – 9 from the US, 4 Canadian, 3

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[39] RiskMetrics' motto is: "To improve financial markets by bringing transparency, expertise and access to all market participants." It has offices in 18 cities around the world, including Toronto. (Ref. http://www.riskmetrics.com/ .)

[40] The report uses data up to 2007. Sampled were: 16 US banking institutions, 3 Canadian, 15 European, five Asian and one Brazilian. Six were Asset Managers, five Investment Bankers and the remainder Diversified Banks.

Australian and the remainder European. Summary charts in the text and in an Appendix offer detailed examples of 'greening' for both retail banking and corporate & investment products and services. Retail products with a green twist include: home mortgages, commercial building loans, auto loans and credit card offerings. Examples in corporate services & investment products include project finance, securitization, bonds and indices. There also is a discussion of asset management and insurance firms.

Another chapter offers an assessment of product opportunities. The report finds that "There continues to be minimal environmental leadership, or at least awareness, in North America's retail banking sector." Awareness and involvement in the corporate and investment banking sector appears to be higher. The CEO briefing highlights carbon markets, green buildings and clean & environmental technology among emerging green financial products.

An Appendix identifies environmental trends, potential costs & implications and potential opportunities for the finance sector in seven areas: climate change, biodiversity, soil & agriculture, water, air, waste, and natural disasters.

The report offers six reasons why North American banks have fewer 'green' products compared to their European counterparts and concludes that "Many 'green' financial products and services ... either remain in the nascent stage of development/implementation or data related to their success/failure has not yet been generated or reported."

The 12 members of the UNEP FI North American Task force include all five major Canadian banks.

Finally, we merely signal a report on the results of a 2005 survey of 49 commercial banks:

International Finance Corporation, Banking on Sustainability – Financing Environmental and Social Opportunities in Emerging Markets, World Bank Group, 2007, 88 pp.,

and an attempt by a French bank at SD labeling of banking products:

Groupe Caisse d'Épargne and Utopies, Sustainable Development Labeling of banking products – Initial methodological approach, Version 1, June 2008, 72 pp.

3.3 Bio-based Products and Technologies

Here is a project sponsored by Environment, Industry and Natural Resources Canada and the National Research Council:

Five Winds International, Sustainability Assessment Framework and Tool (SAFT V2), launched in May 2006.

SAFT is a "screening tool that helps decision-makers and researchers incorporate sustainability criteria (environmental, social and economic) into research & development, investment, and planning and project review decisions." It "should be used as early as possible in the technology and innovation commercialization process." It "prompts decision-makers and researchers to ask 'the right questions'."

A final version was in preparation at the end of 2008.

3.4 Cement

Cement production accounts for 5% of global CO_2 emissions. In 1999, ten leading cement companies, representing one-third of the world's cement production, embarked upon **The Cement Sustainability Initiative (CSI)**, *under the aegis of the* **WBCSD** *(ref.:* www.wbcsdcement.org*). Since then eight more companies have joined; CSI now represents more than half the world's cement production capacity outside China (including Lafarge France; no Canadian-based membership). The CSI commissioned the* **Battelle Memorial Institute** *to perform research. Batelle's final report,* **Toward a Sustainable Cement Industry**, *was issued in* **2002**. *An* **Agenda for Action** *followed that same year. The Agenda details specific commitments for future company actions, timetables and mechanisms for stakeholder engagement. An interim* **Progress Report** *was issued in* **June 2005**. *There is also an untitled 8-page* **overview** *of the Initiative, dated* **March 2007**.

In June 2008, CSI published its **Progress Report 2007** *on-line (ref. www.csiprogress2007.org), covering progress made since the 2002 Agenda for Action in five areas: CO_2 and Climate Protection, Responsible Use of Fuels and Raw Materials, Employee Health and Safety, and Local Impacts on Land and Communities.* **Key Performance Indicators** *in each of these areas have also been developed.*

*A year later, the CSI appealed to the G8 Leaders to adopt sectoral approaches to accelerate reductions in carbon emissions (***The Cement Sustainability Initiative, Paris, 2 July 2008, CSI Press Event, 16 slides***).*

3.5. Construction

The construction industry is one sector where technologies available today could, if adopted, make for very significant energy and cost reductions. The challenges here are creating the necessary incentives to retrofit the existing building stock and overcoming the structural reasons for slow adoption in new construction. A recent effort at analysis and policy prescription is by the National Round Table on the Environment and the Economy *and* Sustainable Development Technology Canada*:*

NRTEE and SDTC, Geared for Change – Energy Efficiency in Canada's Commercial Building Sector, 2009, 114 pp.

The report builds on the Round Table's 2006 Advice on a Long-term Strategy on Energy and Climate Change and on SDTC's 2007 SD business case in Eco-Efficiency in Commercial Buildings. It estimates that Canada's commercial building sector accounts for 14% of end-use energy consumption and 13% of the country's carbon emissions. It notes that a mix of policies are required because suppliers and regulatory regimes are highly fragmented. It sees a reduction from 2006 levels of at least 66% in emissions by 2050 as possible.

The report recommends four policy pathways, the first of which is establishment of a market-wide price signal. A carbon price and specific regulations (codes, standards, labeling) are seen as the most effective. Also recommended are targeted subsidies (capital and fiscal incentives, technology funds, educational and skills development) and information programs that can drive voluntary actions. The report warns that information programs "should be used to complement other policy instruments ..., rather than act on their own."

Figure 8: Policy pathway for GHG reductions in commercial buildings

Of wider scope but with fewer specifics is a report from NAFTA's Commission for Environmental Cooperation:

CEC, Green Building in North America – Opportunities and Challenges, 2008, 78 pp.

The CEC is paying much attention to this sector. It has convened a Green Building Advisory Group (chaired by Jonathan Westeinde of Canada's Windmill Development Group) which issued a Statement in November 2007 and it commissioned eight background papers for this report.

The World Business Council for Sustainable Development is also very active in this field:

WBCSD, Energy Efficiency in Buildings – Business Realities and Opportunities, Summary Report – Facts and Trends, 2007, 41 pp.
WBCSD, Energy Efficiency in Buildings – Business Realities and Opportunities, Summary Report – Facts and Trends, 2007, 35 pp.

(Oddly, the report was published twice, with essentially the same text but different design.)

The 3-year Energy Efficiency in Buildings Project at the WBCSD aims to develop means to achieve zero net energy use for residential and commercial buildings. This first report provides a detailed analysis of current and projected energy use in buildings and what energy savings are possible with existing technologies. Qualitative (interviews with 45 people) and quantitative research (a survey of 1,423 people in eight countries) was conducted to identify barriers to implementation. It finds that, overall, key players in real estate and construction estimate the additional cost of building green to be 17% above conventional construction, whereas in reality the additional cost is likely to be under 5%. Respondents also estimate the share of GHG emissions from buildings to be 19%, whereas in reality the share is 40%. It finds the key barriers to implementation to be lack of information about energy use and costs, lack of leadership, and lack of know-how and experience. Next phases of the project will explore the levers for change.

Hargroves & Smith (2005) *devotes a full chapter to the sector ("Greening the Built Environment," pp. 346-370). (A fuller annotation of Hargroves & Smith is in section 7.2.1.)*

An older Canadian study is:

Morrison Hershfield, A Business Case for Green Buildings in Canada, presented to Industry Canada, March 31, 2005, 45 pp., available from the Canada Green Building Council, www.cagbc.org .

Recognizes that green building is in its infancy in Canada. Concurs that the initial cost of building green is higher but cites US studies showing the NPV of green vs. conventional building to be at least $50 per square foot (using a 20-year horizon).

Hong Kong's builders are going their own way:

Hong Kong BEAM, Green Building Label, Collaborative Action for Energy, Regional Network Case Study, WBCSD, 6 pp., 2008.

Hong Kong's Business Environmental Council developed its own standards, using over 100 best practice criteria to address environmental issues in commercial, residential and

institutional buildings. (BEAM stands for Building Environmental Assessment Method.) About 10% of Hong Kong's building space is now certified. The case study summarizes the barriers to widespread adoption of green building principles:

- fragmented ownership across the building lifecycle makes for short horizons in decision-making;
- the various disciplines involved in design and construction work in isolated silos;
- regulations do not encourage green development and sometimes prevent it; and
- the required building materials may not be locally available or only available at higher cost.

Efforts are now under way to scale up the certification process, not only to the rest of Hong Kong but also to mainland China, where the amount of building space being added annually is the equivalent of 30 new Hong Kongs (two billion square meters).

The paper references a 2003 California study ([41]) which concluded that (presumably LEED-) certified green buildings cost 1.8% more but save 20% in costs over the life of the building.

US architects are playing a lead role in driving change:

American Institute of Architects, Architects and Climate Change, 2-page background sheet, along with much other information, available on www.architecture2030.org .

By reclassifying the energy consumption of the Industry, Commercial and Residential Sectors into Industry and Buildings, the AIA calculates that Buildings are responsible for 48% of US energy consumption. *Architecture 2030*, founded by Edward Mazria, has established detailed targets for the construction and operation of buildings to become carbon-neutral by 2030. The targets have been endorsed by a range of organizations including the US Conference of Mayors and the Royal Architecture Institute of Canada (ref. *RAIC Bulletin*, December 13, 2006).

In 2006, the UK government announced plans to ensure that by 2016 "every new home will be a zero-carbon home" meaning that it would make no net demand on CO_2-emitting energy supply. However, so far very few of the 150,000 houses built annually are applying the technologies that would achieve this goal. An **October 19, 2007** *news article in* ***Ethical Corporation*** *also points out that, in 2050, 2/3rds of the homes will consist of the current housing stock. Retrofitting existing houses must therefore be part of the objective if significant emissions reductions from households are to be achieved.*

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[41] **Greg Kats, The Costs and Financial Benefits of Green Buildings, California's Sustainable Building Taskforce, 2003.**

Catering to the green-conscious home buyer, in 2005 Elden Freeman founded the **National Association of Green Agents & Brokers (nagab**; ref. www.nagab.org), *an organization which now has over 15,000 affiliate members. The association offers an education and certification program.* **Royal LePage** *is one of its partners.* Royal Lepage*'s* **October 2007 Eco Home Survey** *of 1266 Canadian adults (polled by Angus Reid) found that 63% of the respondents were prepared to pay more for an environmentally friendly home.*

On the LEED® standard, please see section 2.4.3 above.

An aside on biophilia:

An antecedent of the current push for green buildings is the idea and practice of Biophilia, first defined by **E.O. Wilson** *(in the* New York Times Book Review, *January 14, 1979; and in his* **Biophilia, Harvard University Press, 157 pp., 1984**) *but with roots in landscape architecture, the teachings of Frank Lloyd Wright, etc. See:*

Corey Griffin, "An Introduction to Biophilia and the Built Environment," ***Newsletter, Rocky Mountain Institute*****, Spring 2004, 5 pp.** (available from www.rmi.org/).

"Greater access to natural systems – such as diffuse sunlight and outdoor air through natural ventilation – has been linked to increased productivity in building occupants." A number of empirical studies are referenced.

Two quotes from Wilson's Biophilia*:*

- To "explore and affiliate with life is a deep and complicated process in mental development. ... our existence depends on this propensity." (Prologue, p. 1)
- "Splendor awaits in minute proportions." (p. 139)

Finally, we note a publication of the Fraser Basin Council:

Fraser Business Council and Community Energy Association, Energy Efficiency & Buildings – A Resource for BC's Local Governments, revised edition, 2009, 64 pp.

Aims to be a manual for "local government officials who want to improve energy efficiency, and reduced greenhouse gas emissions in their communities." It offers practical examples in the areas of energy codes, energy rating and labeling, energy management for civic buildings, and policy tools to advance energy efficiency in the private sector. (Ref.: www.caee.ca .)

3.6 Electricity Utilities

The **WBCSD***'s* **Electricity Utilities Project**, *sponsored by ten global companies, was initiated in 2000 and issued a report in 2002,* **Sustainability in the Electricity Utility Sector**. *In 2006 followed* **Powering a Sustainable Future: An Agenda for Concerted Action**. *In support of this agenda, the project has developed a series of "Facts & trends" on each source of electric energy*

and "Issue briefs" on each plus three further topics. The project is also engaged in a pilot version of an electric utilities supplement to the Global Reporting Initiative (more about the GRI in section 5.3 below).

In November 2007 followed:

Powering a Sustainable Future – Policies and measures to make it happen – An interim report, 22 pp.
Powering Sustainable Solutions – Policies and measures, 36 pp.

The first report notes that the electric power sector is responsible for 41% of global energy-related CO_2 emissions and that electricity demand is projected to double by 2030. It further notes that many of the technological solutions exist today to address the challenge of reducing CO_2 emissions and that a portfolio of policies and measures is needed because the ideal combinations will vary from place to place depending on national or regional circumstances. As a framework for the sector, it adopts the Baseline scenario developed by the International Energy Agency in 2006 which would see emissions increase from about 10 Gt in 2003 to 26 Gt by 2030; and its "Tech Plus" scenario, which would see that increase reduced to 5 Gt.

The second report describes policies and measures for nine key energy technology solutions, ranging from end-use energy efficiency and various power sources to transmission and distribution. In each case the potential for emissions reduction is described, what the status is of the technology (ranging from experimental to market-ready), what the challenges are, and what policy measures are required.

The intent is to use these reports as the basis for dialogue in 2008. Chinese versions became available in July 2008.

Ten years earlier, the **Canadian Electricity Association (CEA)**, *whose members provide about 95% of the electricity in Canada, formulated an* Environmental Commitment and Responsibility (ECR) Program *and, in 1998, made participation in it a mandatory requirement for membership. Under the Program, members monitor and report 16 indicators in accordance with supporting protocols. Members must also have an Environmental Management System in place. The CEA relaunched its program on February 19, 2009 with a news release and video. Its new web site (*SustainableElectricity – **http://www.sustainableelectricity.ca/en/home.php**) *sets out the Program, Guiding Principles, etc. The 2009 Annual report will be available mid-year.*

*Finally, we note an advertisement by IBM in its "Think" series (*Conversations for a Smarter Planet: 2 in a Series -- Smarter power for a smarter planet. *Globe and Mail* and other papers, 19 February 2009; ref. **www.ibm.com/think/ca** .). *The text asserts:*

> With little or no intelligence to balance loads or monitor power flows, [the world's grids] lose enough electricity annually to power India, Germany and Canada combined for an entire year. Billions of dollars are wasted every day generating energy that never reaches a single light bulb. If the Canadian grid were just 5% more efficient, it would be like permanently eliminating the fuel and greenhouse gas emissions from 4 million cars.

For more on energy policy, please see section 7.3.7.

3.7 Food, Beverage and Consumer Products

The US **Grocery Manufacturing Association** (GMA - *"The Association of Food, Beverage and Consumer Products Companies"), at its first-ever Environmental Sustainability Summit in January 2008, released an* **Environmental Sustainability Resource Guide (52 pp.)** *A 39-member Principles Team has been established, as well as three Working Groups – on Packaging, Water Conservation, and Energy and Climate Change. Each of the Working Groups is developing common metrics, etc. Other sections in the Resource Guide clearly suggest that the GMA is equally concerned with the social component of sustainability, including intergenerational equity.*

PriceWaterhouseCoopers, *in a report on "Strategies and Tactics for 2008," for the industry, ([42]) devoted a chapter to "Best practices in Consumer Packaged Goods Sustainability Reporting." Its placement in this context suggests that, in this industry at least, sustainability reporting is rapidly becoming mainstream.*

3.8 Forest Products

3.8.1 The World's Forestry

Begun in 1994 with a multi-stakeholder assessment of the pulp and paper industry, the **WBCSD**, *the World Bank and the World Resources Institute formed The Forest Dialogue. The activity now goes under the name* **Sustainable Forest Products Industry (SFPI)**. *Five topics are being tackled: Forest certification, Illegal logging, Intensively managed planted forests, Forests and biodiversity, and Forests and poverty reduction. In 2001, the world's largest forest companies formed* The Global Forest Industry CEO Forum *and in 2003 the* International Council of Forest and Paper Associations *was established. The SFPI Working Group (which includes Weyerhaeuser Company) issued nine* **Membership Principles and Responsibilities**, *signed by 14 CEOs. The associated 23 commitments became effective 31 March 2007. Other signatures are invited.*

In September 2007, the SFPI Working Group published **Carbon and Climate Change - Key**

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[42] **PriceWaterhouseCoopers, The Food, Beverage, and Consumer Products Industry – Achieving Superior Financial Performance in a Challenging Economy - 2008, 64 pp.**

messages for policy-makers (12 pp.) *The document presents key facts about forests, wood products manufacture, pulp & paper, and forest products and their complex relationship with the carbon cycle. Its ten recommendations include providing incentives for biomass-based technologies (esp. biomass gasification, which could lead to net export of energy from the sector), lowering the cost of capital (i.a. with accelerated depreciation), removing regulatory barriers that discourage combined heat and power production, and being aware of unintended consequences of public policies affecting the forest products value chain.*

Today, about 7% of the world's forests are independently verified for sustainability (270 million hectares), accounting for 20% of industrial production. Both exhibit a rapidly rising trend, especially in OECD countries. (See also, **International Council of Forest & Paper Associations, Sustainability, [2002], 14 pp.***)*

3.8.2 Pulp and Paper

A coalition of environmental organizations, the **Environmental Paper Network**, *is seeking sustainable transformations in the pulp and paper industry. Its first call to action, "A Common Vision for Transforming the Pulp and Paper Industry," was issued in 2002. A second report,* **The State of the Paper Industry: Monitoring the Indicators of Environmental Performance, (77 pp., October 2007)**, *is a comprehensive material analysis of the industry, using both US and global data. Indicators are developed under four themes: minimizing paper consumption, maximizing recycled content, sourcing fiber responsibly, and employing cleaner production practices. Both negative environmental impacts and business opportunities are detailed.*

3.8.3 Forestry in Canada

In February 2005, the **Forest Products Association of Canada (FPAC)** *adopted* **Sustainability Initiative and Principles (4 pp.,** ref. www.fpac.ca). *Four years earlier, it had decided that, by the end of 2006, as a condition of continuing membership its members would be required to have all of their Canadian forestry operations certified under one of three internationally recognized standards: Canadian Standards Association, Forest Stewardship Council, or the Sustainable Forestry Initiative. By December 2006, 96 million ha (out of a total 124 million) were so certified (*ref. **ICFPA Sustainability Progress Update 2007**). *FPAC's first* **Sustainability Report (24 pp.)** *was issued in 2007.*

Another element of FPAC's Sustainability Initiative is the development of Indicators on Environmental Responsibility, Social Desirability and Economic Viability, to help members measure their performance.

Aforementioned SFPI's Carbon and Climate Change *reports that "Canada's pulp and paper sector cut greenhouse gas emissions by 44% during the 1990-2005 period while reducing emissions*

intensity by 54%; over the period the industry's production increased by 20%. In November 2003 it became the first industry in Canada to sign a Memorandum of Understanding with the federal government committing to further emission reductions in the 2008-2012 period..."

On October 30, 2007, at the second annual Business of Climate Change Conference in Ottawa, FPAC announced that the industry will seek to be carbon-neutral by 2015 without purchasing carbon offsets. A three-pronged strategy has been developed, supported by the World Wildlife Fund-Canada and a group of outside advisors.

3.8.4 Forest Product Procurement

In 2007 the **World Resources Institute** *and the* **WBCSD** *created a web site (www.SustainableForestProds.org), which includes a 142-page Report and a Toolkit, to help procurement managers make informed choices. (There is also an 18-page Introduction.) Three sourcing and legality aspects are identified, six environmental aspects and one category of social aspects. The guide is especially aimed at major purchasers of wood and paper-based products who do not have in-house forest or forestry expertise.*

3.9 Information and Communications Technology

The Climate Group, Smart 2020: Enabling the low carbon economy in the information age, 2008, 87 pp.

The report is on behalf of the Global eSustainability Initiative (GeSI) which is supported by Bell Canada and about a dozen of the major companies in the field. Direct emissions from ICT products and services, and how much could be saved, are quantified.

3.10 Insurance

(Please also refer to capital market practices in section 6.4.)

UNEP Finance Initiative – Insurance Working Group, Insuring for Sustainability, June 2007.

The Insurance Working Group (IWG), part of UNEP's Finance Initiative, is an alliance of 16 insurers, reinsurers and brokers from 13 countries (not including Canada). This is its inaugural report. The report asserts that climate change is the greatest but not the only environmental risk confronting the industry. It identifies nine sustainability challenges and four structural barriers to sustainable insurance (in addition to a host of other supply- and demand-side barriers). The IWG believes that a critical question is how insurance can assist developing countries more sustainably and sets out microinsurance as a major future area of work. Development of "Principles" is also under way.

In October 2007, CERES published the third of its periodically updated reports on the insurance industry's response to climate change:

Evan Mills, From Risk to Opportunity: 2007 – Insurer Responses to Climate Change, CERES, October 2007, 62 pp.

The author found 422 real-world examples of climate change-related responses by 190 insurers or insurance-related organizations in 26 countries. An earlier report, in August 2006, found only 192. They are summarized under ten headings. One is "Innovative Insurance Products" under which over 60 examples are cited, offered by a third of the companies. Many other categories have less uptake. The report admits that the response of many insurers has been to limit exposure or making insurance unavailable. "Most insurers are behind the curve in developing forward-thinking products and services in response to climate change." (To be included in the analysis, the company had to be engaged in one or more categories of activities. The sample clearly covers all major insurance companies in the world.)

An example under "Aligning Terms and Conditions with Risk-Reducing Behavior" is Pay-As-You-Drive Insurance. Pilot programs seem to indicate that tying automobile insurance to miles driven can reduce usage by 10 to 15% and lower accident rates.

3.11 Manufacturing

Markus Biehl and Robert D. Klassen, Sustainable Manufacturing Strategies for Small- and Medium-Sized Enterprises in Canada - Pathways for Development - A Draft Definition of Sustainable Manufacturing, Industry Canada, Industries Branch, May 2005, 81 pp.

Defines sustainable manufacturing as a concept that builds on and integrates a wide range of other concepts: lean manufacturing, Total Quality Management, Design for the Environment, Advanced Manufacturing Technologies, supply chain management, pollution control, environmental management systems, and life cycle analysis. Posits that the components of sustainable manufacturing are pollution prevention, pollution control, and management systems. Lists problems/barriers for SMEs to adopt sustainable practices, and success factors. Describes some government programs (OCETA, Quebec's EnviroClub). The authors performed an extensive literature search.

In anticipation of a Green Manufacturing Summit" held in San Francisco in October 2008, eyefortransport (EFT) conducted a survey of manufacturing company executives worldwide:

eyefortransport, Summary and analysis of EFT's survey: "Green Manufacturing: Adoption and Implementation," August 2008, 22 pp.

The survey "targeted" 300 executives, 2/3 in North America, from a wide range of industries. (The report provides no information on the size distribution of the companies.) Many of the questions required simple yes/no answers. Asked whether "they believe that the cost of greening the manufacturing process is getting lower, and the potential profit higher," 71% agreed.

On "lean" or "high performance" manufacturing, see, Industry Canada's web site, **Canadian Resource Guide to High Performance Manufacturing.** *The site contains a long list of federal government programs and services.*

Another Industry Canada web site, **Solutions for Advanced Manufacturing,** *is "focused on Advanced Manufacturing Technologies (AMT) and the Canadian companies that produce these technology solutions."*

A publication by the US Environmental Protection Agency has an odd title and is not overtly about manufacturing but is in effect geared to the "shop floor:"

US Environmental Protection Agency, The Lean and Environment Toolkit, Version 1.0, January 2006, 88 pp.

The toolkit, subtitled "Identify and Eliminate Waste, Reduce Business Costs and Risk, Improve Environmental Results," "builds on work conducted and research sponsored by EPA's Lean Manufacturing and Environment Initiative" and aims to "enable Lean practitioners to improve both their business performance and their environmental performance by identifying and eliminating environmental wastes at their organizations." Methods used include Value Stream Mapping, Kaizen Events (also known as rapid process improvement events) and "6S" (the 5 pillars of the visual workplace pioneered in the Toyota Production System – Sort, Set in order, Shine, Safety, Standardize, and Sustain -- plus an additional Safety pillar). Appendices explain all the methods in detail and provide checklists.

3.12 Mining

In 2000 the WBCSD initiated a Mining & Minerals and Sustainable Development project to obtain an understanding of how to maximize the contribution of the sector to sustainable development at all scales. The project resulted in a **2002** *report,* **Breaking New Ground** *by the* **International Institute for Environment and Development.** *The report sets out key challenges, an agenda for change and basic elements of a Declaration on mining, minerals and sustainable development.*

This was followed in Canada by:

Mining Association of Canada, Towards Sustainable Mining (TSM), brochures dated December 2005 and June 2007, 6 pp.

TSM was launched in 2004 and subscribing to its guiding principles is a condition of membership in the Association. Its 29 members "account for the vast majority of Canada's output of metals and major industrial minerals" and include companies involved in mining, smelting and refining of iron ore, diamonds, uranium, oil sands, coal and industrial minerals. The Association is reaching out to provincial mining associations to support TSM and has made representations to national mining associations in the developing world.

In March 2007, an Advisory Group comprising a wide range of stakeholders issued a report on "Good Overseas Practices," the result of a ten month government-led roundtable process. The report lays out recommendations for a Corporate Social Responsibility framework of good conduct for Canadian mining, oil and gas operations in the developing world.

In July 2007, in conjunction with the World Conservation Union and under the guidance of a Community of Interest Advisory Panel, the Association released a 6-point "Mining and Biodiversity Conservation Policy" framework.

Citigroup Research *has published an assessment of the physical impacts of climate change on the 12 largest mining companies in the world that their analysts follow (***Global Mining, 12 September 2007, 24 pp.***) These impacts are: severe weather, fresh water supply, arctic de-icing, disease and malnutrition in Africa, iron ore and nickel supply, and company awareness of the issues. Company responses to a question in the Carbon Disclosure Project (see section 5.4) below) are also shown.*

3.13 Mobility

The **WBCSD's Sustainable Mobility Project** *was established in 2000; it was sponsored by the major car manufacturers and concentrated on road transportation. Following an initial study, "Mobility 2001," the Project concluded in* **July 2004** *with a comprehensive report,* **Mobility 2030: Meeting the Challenges of Sustainability (180 pp.).** *Using twelve indicators, the report concludes that, on current trends, road transportation is not sustainable. It proposes seven goals that, if achieved, would improve the prospects for sustainability. These goals are very broadly stated, e.g., "Limit GHG emissions from transport to sustainable levels." Much of the report, however, evaluates where the world stands with respect to each of the seven goals. A final chapter discusses how car manufacturers can contribute to achieving the seven goals.*

Work since 2004 has been embedded in the WBCSD*'s* Development Focus Area. *From this Area came, in* **October 2007, Mobility for Development: Facts and Trends briefing (20 pp.)** *While building on Mobility 2030, the focus here is on mobility as an enabler of development.*

3.14 Ports

More than 50 ports authorities from around the world gathered in Rotterdam in July 2008 to discuss how the ocean-going transport sector could cut GHG emissions. There appeared to be no agreement on its current contribution, let alone on targets. A draft "World Ports Climate Declaration" was circulated and about 80 ports would be invited to sign it. (Source: **Mariette le Roux, *AFP*, 9 July 2009.**)

3.15 Postal Services

The **International Post Corporation** *groups 24 postal service systems in developed countries, including Canada Post. At its 2008 Annual Conference in France on 30 May 2008, the IPC launched a "***Global Carbon Measurement System***," distilled from a number of best practice standards (ref.* www.ipc.be *). Answers to a questionnaire and other information will result in scores in ten management proficiency areas.*

3.16 Railways

On May 15, 2007, the Railway Association of Canada (RAC), *Transport Canada and Environment Canada signed a Memorandum of Understanding (MOU) to help reduce the rail sector's share of air pollution and GHG emissions. Already, use of more fuel-efficient locomotives and various operational changes have resulted in emission reductions even while volumes are up. CN, CP, VIA and Go Transit commit to acquiring only EPA-certified locomotives, to retire units built between 1973 and 1999, and other measures. The MOU sets out 2010 CO_2 emission targets for four types of railway operations. Ref.:* **Transport Canada, "Backgrounder - Memorandum of Understanding between the Government of Canada and the Railway Association of Canada,"**, *and a special information supplement in* ***The Globe and Mail*** *of* **15 October 2007**.

3.17 Steel

In 1998, the **Canadian Steel Producers Association (CSPA)** *issued a Statement of Commitment and Action for Environmental Protection; it considered its objectives completed in 2003. (The Statement is no longer available on the CSPA web site.) The Association has an Environment and*

Energy program and, in January 2005, concluded a **Memorandum of Understanding** *with the federal government* **"Respecting the Development of Climate Change Commitments for 2008-2012."** *(The Ontario government provided support in an Annex.) CSPA is working with these governments to develop Sustainability Indicators to track performance and identify opportunities.*

The International Iron and Steel Institute *plans to monitor CO_2 emissions of its members (which include the China Iron and Steel Association) but will not make the data public.* **Peter Marsh**, *writing in the* ***Financial Times*** *of* **25 October 2007**, *quotes the CEO of US Steel as opining that many steel makers may not want to take part in the scheme if they know the data will become public. On the other hand, Sweden's largest steelmaker and a major Chinese steel maker are quoted as favouring disclosure.*

3.18 Tire Industry

In January 2006, a $1 million Tire Industry Project *was launched under the auspices of the* **WBCSD**. *The eleven companies represented on the Project account for 80% of the world's tire manufacturing capacity. An* **October 2007** *summary report (***6 pp.***) explains that a comprehensive database of the scientific literature has been assembled regarding two issues: health and environmental impact of chemicals commonly used in tire making, and the fate and possible effects of particles generated during normal use and wear. Six of seven identified tasks for 2007-2008 are about the particles issue. An additional $2 million has been authorized for the Project and a small independent assurance group has been set up to referee its work.*

3.19 Tourism

The Tourism Industry Association of Canada (TIAC) was an early adopter of sustainable practices. Its initiatives go well beyond promoting eco-tourism:

TIAC, Canada's Code of Ethics & Guidelines for Sustainable Tourism, released February 2005, 2 pp.

TIAC began work on a Sustainable Tourism strategy in 2003, in partnership with Parks Canada and with support from the Canadian Tourism Commission. (Preceding it, in 2001, was a historic Accord with Parks Canada.) The Guidelines balance "economic objectives with respect for the natural, cultural and social environments in which we work." TIAC is now in the process of developing a Sustainable Tourism Toolkit, intended to provide practical and concrete tools to the industry, especially SMEs. A draft was presented at the Tourism Summit in Victoria in November 2007.

TIAC firmly embraces a triple bottom line framework. The Association's web site lists about 500 members, including municipal and provincial tourism offices, airport authorities, hotels, destinations and other tourism associations.

*The "***Audubon Green Leaf™ Eco-rating***" program is marketed by* **TerraChoice Environmental Marketing Inc.** *For an initial investment of $1,000 + $1 per room, accommodation facilities can earn up to five "green leafs" and receive specific guidance on opportunities for improvement. As of June 2007, the TerraChoice web site listed 42 Canadian participating establishments.*

World Tourism Day 2008, celebrated on 27 September in Lima, Peru, took place under the banner of "Tourism Responding to the Challenge of Climate Change." (Ref.: www.unwto.org.*)*

3.20 Vinyl

The **Vinyl Council Canada**, *a Council of the Canadian Plastics Industry Association, has a voluntary Environmental Management Program, modelled in part after the CCPA's Responsible Care® program. The program has six guiding principles, five commitment areas and a series of practical action steps. The most recent* **Progress Report**, *its* **Third**, was issued in **2003.**

3.21 Role of Industry Associations

As noted, several of these sector-based efforts towards greater sustainability were initiated or are sponsored by industry associations. Six Canadian associations are examined in:

Five Winds International & Strandberg Consulting, The Role of Industry Associations in the Promotion of Sustainability and Corporate Social Responsibility: *Study Findings*, March 2007, 103 pp.

This study was sponsored by Natural Resources (lead), Industry, Environment and Foreign Affairs and International Trade Canada in the context of an Memorandum of Understanding on Corporate Social Responsibility (more about CSR in Section 5.1). ([43]) Associations covered are: the Canadian Association of Petroleum Producers (CAPP), the Canadian Bankers Association (CBA), the Canadian Chemical Producers Association (CCPA), Canadian Manufacturers and Exporters (CME), the Forest Products Association of Canada (FPAC), the Prospectors and Developers Association of Canada, and the Retail Council of Canada (RCC). CME and CBA have no formal sustainability vision or strategy. As noted above, CCPA launched Responsible Care® in 1985. CAPP adopted a stewardship model in 1999; it became mandatory for membership in 2003. As seen, FPAC adopted its Principles in 2005. The RCC held its first CSR conference in October 2006.

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[43] The study also feeds into the federal government's Sector Sustainability Tables (ref. www.sst-tdds.gc.ca). To date, there are Tables on Energy, Forestry, and Mining.

3.22 Integration

Finally, a Stratos report and presentation sponsored by Industry Canada explores the extent to which seven leading companies go beyond managing issues by integrating sustainability into their business processes:

Stratos, Sustainability Integration into Business Processes – A Study of Leading Canadian and International Companies, July 2007, 31 pp. + case studies.
Stratos, Integrating Susuainability Into Business Processes – Case Studies of Leading Companies, presentation at Industry Canada, March 25, 2008, 27 slides.

The study is based on interviews with senior officials at Bell Canada, Suncor and Vancity, as well as Hewlett-Packard, Rio Tinto and Vodafone. These companies were chosen because they were seen to be sustainability leaders in their respective sectors. The analytical framework to examine the degree of integration encompasses governance, business processes (strategic and business planning, business development, risk and project management, disclosure, and assurance), stakeholder engagement (community and investor relations), and human resources (recruitment and training).

Key findings are set out in detail and an Appendix devotes five to seven pages to each company's attributes. The paper concludes by identifying a number of best practices in each component of the analytical framework.

The slide presentation was based, in part, on one given at the March 2008 Global Conference in Vancouver. A 7-page brochure with the same title is also available.

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SECTION 4 The Business Case

This section asks whether pursuing more sustainable practices is profitable. The question has been studied extensively in the past, but has not attracted much recent research. It will be suggested later why that may be so. More common in recent years is the question whether sustainability is rewarded in the stock market. That literature will be discussed in Section 6.

4.1 Analyses

Hardly a day goes by without the media reporting on a business that has found that "going green" is a profitable proposition. ([44]) Yet, both recent and past theoretical literature or solid empirical work on the Business Case is relatively rare. The most persuasive recent empirical work found to date is:

Peter M. Clarkson, Li Yue, Gordon D. Richardson and Florin P. Vasvari, "Does it really pay to be green? Determinants and Consequences of Proactive Environmental Strategies". November 2006, 41 pp. Best Paper Award at the 2006 ASAC Conference.

Firmly grounded in the **resource theory of the firm**, ([45]) the paper focuses on financial and organizational resources that are unique to a firm and could explain why some firms successfully engage in proactive environmental policies while others do not. Uses firm-level data over 1990-2003 for four US industries (pulp & paper, chemicals, oil & gas, and metals & mining) on profitability, cash flow, leverage (all lagged – proxies for financial resources);

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[44] *See also the* **December 2006** *issue of* **Scientific American** *- special advertising section, "Green Business Equals Good Business," 5 pp., available on the WBCSD web site; and "A special information supplement for the Conference Board of Canada" (10 pp.),* ***The Globe and Mail,* October 2, 2007**. *See also the October 1, 2007 Policy Declaration of the Canadian Council of Chief Executives, referenced in section 1.4.*

[45] The resource theory of the firm holds that internal attributes, in the context of external conditions, can explain why a firm is good at doing what it does. This thinking goes back to Penrose in the 1950s but was considerably enriched by later management-type literature. It brought the internal and the external together. Alternative terms used in this context are ability & opportunity, and financial & organizational attributes. See **Russo & Fouts (1997)** in this section for more details.

R&D/sales, sales growth and Tobin's Q ([46]) – proxies for innovative management; the inverse of toxic releases (TRI) per $K of cost of goods sold – proxy for environmental performance; and three control variables: firm size, net/gross property, plant and equipment (proxy for equipment newness), and capital expenditures/sales (proxy for capital intensity).

A year t=0 is found when a firm's environmental performance *deteriorates* (moves down at least two quartiles within its industry over a 3-year span) – and is then labelled an "anti-repenter – or *improves* (moves up at least two quartiles over a 3-year span) – and is then labelled a "repenter." For 24 anti-repenters they find an equal number of firms within the same industry whose environmental performance ranked in the best two quartiles *throughout* the period. Similarly, for 43 repenters they find matching firms that ranked in the worst two quartiles *throughout* the period. Return on Operating Assets and Tobin's Q are then compared for these matching sets over a 7-year period, t=-3 to t=+3. Conclusion: **Repenters do better; Anti-repenters do worse**, thus disproving that poor environmental performance is the way to make more profits..

Comment: This is by far the most interesting empirical study I've come across, well-grounded in theory and providing evidence that "it pays to be green." Rigorous statistical tests are performed throughout. Its major weakness is its measure of management capacity: Using Sales Growth and Tobin's Q as proxies seems to be essentially circular. Also, the firm size variable is not explained and there is no theory on why size matters. A limitation of the approach is, of course, that data are only available for publicly traded firms.

An earlier study, also rooted in the resource theory of the firm:

Michael V. Russo and Paul A. Fouts, "A Resource-Based Perspective on Corporate Environmental Performance and Profitability," *Academy of Management Journal*, Vol. 40, No. 3, 1997, pp. 534-559.

Extensive references to earlier work and exposition of the resource theory perspective. Data are for 243 US firms for which the authors could construct an environmental performance rating. (*Comment:* There is no information on the sample's characteristics.) Regressions on ROA allow the conclusion that "'it pays to be green' as a rule, and that this relationship strengthens as industry growth increases."

[46] The authors use a simplified form of Tobin's Q, defined as the sum of the market value of equity, plus the book value of total debt and preferred shares, all divided by total assets.

*Robert Klassen and Markus Biehl in 2008 completed for Industry Canada a business case analysis of Canadian manufacturers, further to their theoretical framework referenced in section 3.11 above (***Biehl and Klassen, 2005***):*

Robert D. Klassen and Markus Biehl, "Building the Business Case for Sustainable Manufacturing: Linking Lean and Green Management to Performance - An Empirical Analysis of Outcomes from Environmental Expenditures in Manufacturing," for Industry Canada, Policy and Sector Services Branch, 31 March 2008, 107 pp.

The study makes use of data on Canadian manufacturers derived from three sources: Statistics Canada's Survey of Environmental Protection Expenditures (SEPE, 2004), the Annual Survey of Manufactures and Logging (ASML, 2003, 2005), and data from the National Toxic Release Inventory (NPRI, 2003, 2005) Discarding imputed data in the ASML, and considering only the ten 3-digit industries covered by SEPE, matching data sets of about 1000 to 450 establishments could be analyzed; firm-level analysis was also performed, for about 300 entities. Three size classes were distinguished, small (20-99 employees), medium (100-499) and large (500+).

Attempting causal explanations by using a lagged variable for past performance, the authors tested the following relationships: Impact of environmental practices and of environmental expenditures (both their level and the allocation between pollution control, pollution prevention and management systems) on manufacturing performance (four categories of direct costs and three categories of inventory), profitability (gross margin) and environmental performance (pollutants). Environmental practices were, using principal component analysis, distilled into internal system practices and supply chain practices. Where appropriate, variables were scaled by revenue. E.g., the impact of pollution was measured as pollution intensity (impact per dollar of revenue).

Findings include that one-half to two-thirds of environmental expenditures were for pollution control and that supply chain practices were rather rare. Over the two-year period, pollution intensity decreased most for large establishments but releases (one of four pollution measures employed) decreased across all firm sizes. Management system practices become more widespread with increased size. As for the regression results, apart from coefficient estimates for the lagged performance variable and revenue growth, few other statistically significant estimates were obtained. Management systems expenditures appear to have the greatest pay-off in terms of reduced material costs, reduced energy costs (for small firms), reduced labour costs and a reduced level of inventory. The level of pollution prevention expenditures per dollar of revenue was significantly related to lower energy costs, while increased allocation towards pollution control was related to higher labour costs. Overall, given that the data were scaled by revenue already, there appeared to be few additional economies of scale. In the firm-level analysis, however, the number of establishments owned by the firm often was found to be significantly related to a smaller reduction in pollution intensity, suggesting organizational challenges in multi-establishment firms.

Conclusions drawn include that the low allocations to pollution prevention and management systems are difficult to defend. "Both of these alternatives ... hold much promise for reducing costs, and improving competitiveness and environmental performance, whereas pollution control only adds to cost." The results also suggest a differential approach to promoting 'lean and 'green' manufacturing, depending on the size of the firm.

Comment: Linking three data bases, the study estimates a very fine-grained management-oriented model. The scaling by revenue is especially commendable, as is its use of advanced statistical techniques. However, the model may be asking more than the data can provide. The authors duly note the limited information yielded by yes/no answers on practices. The limited timeframe of the data is also acknowledged. Less attention is given to the fact that Statistics Canada administers the "long" SEPE survey only to firms with annual environmental expenditures of at least $1000 per employee. Firms with fewer than 50 employees are also only surveyed in certain provinces and territories.([47]) Large segments of Canadian manufacturing are therefore outside the scope of this study. As for NPRI data, the authors duly note that they are known to be of poor quality (they make valiant efforts to 'clean' them).

A study based on the 2003 OECD Survey referenced earlier (please see section 2.4.3.4 for an annotation on the survey) also deals with the relation between environmental and financial performance:

Nicole Darnall, G. Jason Jolley and Bjarne Ytterhus, "Understanding the relationship between a facility's environmental and financial performance," Chapter 6, pp. 213-259, in Nick Johnstone, editor, Environmental Policy and Corporate Behaviour, Edward Elgar & OECD, 2007, 269 pp. An earlier version was published as OECD paper ENV/EPOC/WPNEP(2005)11, "Does a Facility's Environmental Performance Predict its Financial Performance?", April 2005, 36 pp.

The authors recognize that environmental and financial performance may be endogenous and employ a bivariate probit model to ask whether companies benefit financially by improving their environmental performance. They review various reasons why this may be so but are naturally restricted in their theorizing by the data the survey could supply.

Twenty-two studies published between 1993 and 2002 are reviewed. The authors find in them the conclusion that "there appears to be a positive relationship between a firm's environmental actions and its financial performance." Controlling for endogeneity, they too find that

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[47] See http://www.statcan.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=1903&lang=en&db=IMDB&dbg=f&adm=8&dis=2 , accessed 19 May 2008.

environmental performance correlates positively with profits and even value of sales. They also find that a more stringent regulatory regime diminishes profits. But at the same time it is pressure from regulators that is an important motivator encouraging companies to reduce their environmental impacts. The number of employees is invariably a highly significant explanatory variable.

Looking for differences between 'clean' and 'dirty' sectors, between early and late movers, and between high- and low-growth industries delivered few significant results.

Comment: While starting out with orthodox neo-classical theory, data limitations force largely ad hoc reasoning. There is little discussion of the results obtained in the 'context' part of the model – indeed, the specification of the full bivariate model is not evident. Very few industry and country dummy variables obtain significant loadings, which makes one suspicious. Despite the large number of observations, and while generally confirming the finding of a positive relationship between good environmental performance and profits, the study may be asking too much of the data.

While not an empirical study in the traditional sense, also firmly grounded in practical experience is:

Bob Willard, The Sustainability Advantage, 2002, New Society Publishers, 240 pp. (plus Worksheets for Large Enterprises).
Bob Willard, The Next Sustainability Wave, 2005, New Society Publishers, 368 pp. (plus Worksheets for SMEs).
Bob Willard, "Selling the Sustainability Business Value Proposition - A seminar" (found on Industry Canada's Sustainable Development web site under "SD Research").

The Next Sustainability Wave is aimed at CEOs or at "sustainability champions" in or outside corporations who seek to convince senior management of the benefits of adopting sustainable practices.. The book consists of 1-page sections on the right-hand side, with supporting quotes or data (or sometimes Dilbert cartoons) on the left-hand side; many of the quotes are from the 43 experts the author interviewed.

The author posits five Sustainability Stages: Pre-compliance, Compliance, Beyond compliance, Integrated strategy, and Purpose and passion. The book projects that there will soon be a critical mass of Stage 4 firms.

The first book identified three drivers (a founder's personal passion, a public relations crisis, and regulatory pressure). The second book extends the analysis/argument to two emerging drivers: a "perfect storm' of threats, and compelling business value. This is followed by a chapter that goes through four sets of inhibitors – objections that senior management is expected to make. An Appendix adapts the arguments for SMEs. There are extensive endnotes and a 4-part bibliography.

In the business case, seven benefits are identified and quantified for a hypothetical SD Inc. (a composite of five real high-tech companies), using what would appear to be conservative assumptions derived from case studies. Bottom line: a net profit increase of 38%. The SME version (for a generic 50-employee firm) identifies six benefits, yielding a profit increase of 46%.

Comment: This is a valuable compilation of the state of knowledge, up to ca. 2004, about what SD means for business. Some sources are a bit strange (e.g., definitions of SMEs from a Canadian Heritage web site) but most are quite solid. Many of the arguments are well-put, in plain and often elegant language.

For many case studies, from Australia and around the world, see **Hargroves and Smith (2005)**, *annotated in section 7.2.1 below.*

Another empirical study, though of limited scope:

Bruce Clemens, "Economic incentives and small firms: Does it pay to be green?" ***Journal of Business Research*****, vol. 59 (2006), pp. 492-500.**

Based on a 2003 survey of 76 scrap yards in the US steel industry; the average size was 62 employees and the largest firm had 275 employees. Used self-reporting for financial performance (the average response to five questions comparing the firm's performance to that of its competitors), green performance (the average response to five assertions) and the existence of green incentives (the average response to four assertions), as well as two control variables (firm size and confidence in existing green standards). Found, through regression analysis, a positive correlation between financial and environmental performance, and a somewhat weakened correlation when there are higher perceived levels of green incentives.

The author admits that the results do not prove causality: One could argue that good financial performance enables investment in green improvements. Still, various statistical tests of reliability of the data (including non-response bias – the response rate was 46%) are performed. There is an extensive reference list.

A recent empirical study of large firms, which also seeks to validate the relationship between reporting and sustainable outcomes:

Olaf Weber, Thomas Köllner, Dominique Habegger, Hendrik Steffensen and Peter Ohnemus, The relation between sustainability performance and financial performance of firms, GOE Report No. 5-2005, Zurich (www.goe.ch) and Asset4 (www.asset4.com), 19 pp.

Analyzes 100 companies from 19 countries (five from Canada), allocated by sector and region to mirror the composition of the MSCI World Index (www.msci.com). Seeks to answer two questions: do companies that report on sustainability activities also have positive sustainability outcomes; and do companies that do well on sustainability issues also show better financial performance. Nineteen percent of the sample used the GRI Guidelines (see section 5.3 below) to report on their SD practices, 53% reported without using GRI, and 28% did no SD reporting.

The authors use the GRI framework to construct quantitative and qualitative (yes/no) indicators of performance. Financial performance indicators for 2001-2004 (EBITDA, ROA, ROE and Total Return per Share) were also collected. Four Outcome indicators (of economic, environmental and social outcomes, and corporate governance) are then regressed on various Driver indicators (profile, vision & strategy, and economic, environmental, social and corporate governance performance). To analyze the relationship with financial performance, the companies were divided on either side of the median and binary regressions were run with various Outcome and Driver indicators as the independent variables; ditto with only Outcome variables and with only Driver variables. (*Comment:* not all variables are fully described, nor are all equations specified and statistical results fully reported.)

Significant results are obtained for economic, environmental and social performance, but not for governance. I.e., **companies that do well on the GRI indicators were found to have a positive impact on sustainable development**. For financial performance, best results (highest R^2, lowest p) were obtained with the EBITDA regressions: using all independent variables, the correct EBITDA margin group could be predicted in 85% of the cases; using only Outcome variables, correct predictions were still 69%, while using only Driver variables yielded 83% correctness. Similar results were obtained with the ROA and ROE regressions. However, no significant relationships were found in the regressions on Total Return per Share.

Please see section 6.2.4 below for an annotation of **Guenster et al. (2006),** *which also reports results of regressions on US firms' ROA.*

Note that **Lynn Johannson**'*s* **Handbook on Green Productivity** *and* **Going for the Green**, *both referenced in section 2.3.1, are chock-full practical examples of profitable 'green' improvements. Eco-efficiency tools, referenced in section 2.4.1, also address the effect of good environmental management on the financial bottom line.*

Brief annotations of earlier work:

Association of Chartered Certified Accountants and URS Corporation, The big picture: how the environment influences corporate profit, 2004, 74 pp.

A series of very brief papers on a range of subjects, loosely on the theme of how organizations can "capitalise on the growing socially responsible investment market through sound and innovative environmental practices."

George Carpenter and Peter White, "Sustainable Development: Finding the Real Business Case," *International Journal for Sustainable Business*, vol.11 no. 2 (February 2004), pp. 2-51 - 2-56.

The authors are with Proctor & Gamble and demonstrate how, by linking "opportunity" with "responsibility," the real business case emerges. The opportunity they see is found in the UN Millennium Development Goals.

Marc Orlitzky, Frank L. Schmidt and Sara L. Rynes, "Corporate Social and Financial Performance: A Meta-analysis," *Organization Studies*, vol. 24, no. 3 (2003), pp. 403-441.

Sees environmental performance as only one form of corporate social performance. Conducts a rigorous statistical analysis of 52 studies of the last 30 years. Meta-analyzes 139 correlation coefficients between environmental and financial performance, based on nearly 10,000 observations, and finds that 40% of the variance is explained, with a mean coefficient of .12 and a variance of .11.

Charles Holliday [DuPont], Stephen Schmidheiny [Anova] and Philip Watts [RD Shell], Walking the Talk - The Business Case for Sustainable Development, Greenleaf Publishing, 2002, 288 pp.

An excellent exposition of the business case, but virtually all references and examples are for large businesses – very much a WBCSD perspective. Includes nine case studies.

Andrew A. King and Michael J. Lenox, "Does it Really Pay to be Green? An Empirical Study of Firm Environmental and Financial Performance," *Journal of Industrial Ecology*, Vol. 5, No. 1 (2001), 105-116. Also a powerpoint presentation by Andrew King, "Symposium on Sustainability: Why does it pay to be green?", 17 October 2001.

Critical review of the literature on "it pays to be green" and the financial impact of being green. Data on 652 US manufacturing firms, 1987-1996. Sets very high standards for "proving" causality. The paper's reporting on empirical results falls short of full disclosure. Noteworthy, but hardly remarked upon, is the persistent finding of an inverse, significant relationship between Tobin's Q and Emissions.

Sandra A. Waddock and Samuel B. Graves, "The corporate social performance-financial performance link," *Strategic Management Journal*, vol. 18 no. 4 (1997), pp. 303-319.

The paper takes much of its inspiration from the strategic management literature. It seeks to test whether the relationship between corporate social performance (CSP) and financial performance is positive, neutral or negative, and which way the causality flows. Data are for 469 companies in the S&P500. CSP is measured using the then relatively new KLD ratings for 1990. ([48]) Financial data are for 1989 when CSP is the dependent variable, and for 1991 when profitability is the dependent variable. Control variables are size (because "smaller firms may not exhibit as many overt socially responsible behaviors as do larger firms"), measured variously by total assets,

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[48] See below, in *Sidebar 4*, for more information on KLD Research & Analytics. KLD began its ratings in 1988.

total sales and number of employees; "management's risk tolerance," measured by the debt/asset ratio; and industry (the sample spans 13 industry groupings).

Rather than using the raw KLD ratings, for each of the eight elements (employee relations, product attributes, community relations, environment, diversity, and involvement with nuclear power, military contracts and South Africa) the authors averaged the weights independently suggested by three CSP experts. Their suggestions did not diverge much. The main effect was that the 'negative screens' (the last three elements) received much less weight than the others.

In all models CSP is found to relate positively to financial performance. The strongest results are obtained when CSP is the explanatory variable and the dependent variable is return on assets or return on sales; the debt/asset ratio is then also significant as is, in the ROA equations, the size variable. Industry loadings are not reported but presumably significant.

Because the causality appears to run both ways, the authors conclude that there is a virtuous circle: strong profitability allows good social performance (the 'slack resources' theory), and doing good socially leads to strong financial performance (the 'CSP is good management' theory).

Comment: The debt/asset ratio seems a poor proxy for management's risk tolerance and may signal many other factors. Nor is risk tolerance of managers necessarily the most indicative factor for either profitability or CSP. Also, the virtuous circle hypothesis is not tested in a simultaneous equation framework. Finally, as the authors recognize, one cross-section with data lagged one year far from exhausts the search for causality.

Stuart L. Hart and Gautam Ahuja, "Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance," *Business Strategy and the Environment*, vol. 5 (1996), pp. 30-37.

Using data for 127 firms in U.S. goods-producing industries, drawn from S&P's 500, regresses return on sales, assets and equity for 1989-92 against emissions reductions in 1988-89, controlling for average return in the firms' respective industries, capital structure, capital/sales, advertising/sales and R&D/sales. Obtains positive loadings from 1990 onwards when the dependent variable is return on sales or assets, and from 1991 onwards when the dependent variable is return on equity. Also divides the sample in high polluters and low polluters and finds that emissions reductions enhance performance among the former but become insignificant among the latter. Notes that a reverse causality hypothesis cannot be ruled out because only one year's worth of emissions reductions data were used.

These last two papers are among 95 reviewed in a lucid meta-analysis of empirical work published between 1972 and 2000 on the broader question of the relationship between corporate social and financial performance:

Joshua Daniel Margolis and James Patrick Walsh, <u>People and Profits? The Search for a Link Between a Company's Social and Financial Performance</u>, Lawrence Erlbaum Associates, Mahwah, N.J. and London, 2001, 154 pp.

In the 86 studies that deal specifically with social and financial performance, the most commonly measured aspect of 'social performance' was environmental practices, but ten other domains also have been the subject of research. **Fifty-five studies found a positive relationship between social and financial performance. Multi-variate models, in**

particular, most often did so. The choice of control variables is so varied, however, that comparisons are difficult; industry effects, company size and market risk are most commonly used. The authors note that "A systematic and theory-based selection of other institutional, industry and firm level factors would help to identify the magnitude" of the relative contribution that social performance makes to financial performance. No wonder that relatively few of the 95 studies, in the estimation of the reviewers, came up with "strong" results.

In conclusion, the final words of Margolis and Walsh (2001) are worth pondering:

> Evidence of an association between social and financial performance may promise to settle theoretical disputes over the purpose and responsibilities of the firm, and it may provide rhetorical artillery for those seeking to advance corporate efforts. [But ...] From the perspective of managers and executives, it seems especially important to understand how best to manage corporate social initiatives. From the perspective of larger society, it seems especially important to consider the conditions under which society is well served by corporate solutions to social problems.

As we have seen, since 2000 the empirical link especially between environmental and performance and profitability has been subjected to further study, and the resource theory of the firm appears to be the most promising theoretical framework that can explain why some firms "get it" and others (still the majority) don't. Academic work as well as practical guidelines and case studies continue to clearly point in the direction of the existence of a business case for sustainable practices. Along with the increased awareness of the ecological imperative one may wonder, with Margolis and Walsh, whether "proving" the link continues to be a worthwhile endeavour. It may be more fruitful to get on with the task and explore further applications of sustainable behaviour, within firms, within industries and in society at large.([49])

We review next some work that deals with methods to prove the business case.

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[49] *One senses a similar impatience to get on with corporate applications in* **Peloza & Yachnin (2008)**, *reviewed next:*

> "To date, researchers have concentrated on establishing the business case for sustainability. Although useful, this work has taken the place of research needed to help managers establish strategies for measuring the financial impact of sustainability initiatives." (p. 1)

4.2 Proving the business case

The Research Network for Business Sustainability's sponsored project for 2008 ([50])was a "Systematic Review" of how business sustainability was to be valued:

John Peloza and Ron Yachnin, Valuing Business Sustainability: A Systematic Review, November 2008, 30 pp.
RNBS, Knowledge Forum on Valuing Business Sustainability, March 2008, 30 pp.
RNBS, Metrics for Valuing Business Sustainability: An Executive Briefing, n.d. [November 2008], 6 pp.

These publications are available on the RNBS web site, http://sustainabilityresearch.org .

The review focuses on "the tools and metrics that have been used to quantify the financial impacts of sustainability." Building on the meta-reviews of Margolis & Walsh (2003)([51]) and of Orlitzky et al. (2003), the authors compile a total of 128 academic articles published between 1972 and 2008. A further 31 studies by practitioners, published between 2001 and 2008, are reviewed.

Sixty-five of the environmental metrics and 55% of the social metrics show a positive relationship between sustainability and financial performance. The authors then propose a taxonomy of metrics: environmental and social metrics, mediating metrics (input/output, employee, innovation and reputation measures), intermediate outcome metrics (cost, revenue and integrative measures), and end state outcome metrics (market, accounting and perceptual).

They argue that mediating metrics "are essential for assessing the business case for sustainability" because they alone can prove causality and they help managers manage the process." They urge better cooperation between academics and practitioners.

Leading up to the final report, the Network held a Forum in Toronto, in January 2008, where seven experts shared their insights. The dialogues with attendees were facilitated by Prof. Tima Bansal of the Ivey Business School, Executive Director of the Network.

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[50] *The RNBS was introduced in section 2.1.*

[51] **Margolis & Walsh (2001)** – see section 4.1 – is not referenced. The cited work is Margolis & Walsh (2003), which covers the same ground; please refer to Appendix D for the full reference. **Orlitzky et al. (2003)** is also annotated in section 4.1.

Ron Yachnin 's sdEffect™ demonstrates various methods of evaluating the business case:

Yachnin & Associates, Sustainable Investment Group Ltd. and Corporate Knights Inc., <u>The sdEffect™: Translating Sustainable Development into Financial Valuation Measures – A Pilot Analytical Framework</u>, prepared with the financial support of the National Round Table on the Environment and the Economy, February 2006, 51 pp.

The author selected five large Canadian mining companies (Alcan, Inco, Noranda/Falconbridge, Placer Dome, and Teck Cominco) and scoured their sustainability reports for data to work up ten examples that could be valued using one or more of five financial valuation techniques: discounted cash flow (DCF), price to cash flow per share P/CFPS), price to net asset value, option pricing valuation, or economic value added (EVA).

For example, waste diversion at Inco saves the company $2.4 million per year. Using DCF, this translates into $31 million in shareholder value or worth 6 to 16 cents/share (using P/CFPS). Noranda/Falconbridge reported significant improvement in its reportable injury frequency. Grossing up to total injuries and assuming a cost per injury (including lost productivity) of $50,000, the authors then calculate how much economic value (wealth) would be added if an initial investment of $10 million and ongoing annual investment of $1 million were required to maintain a superior level of safety. They find that the average annual EVA is $7.3 million or an incremental value of 19 cents/share.

In an application of option pricing, Yachnin assumes that Inco is considering opening a new mine in Voisey's Bay but the provincial government insists that a smelter be developed on-site. As a result of having a solid track record on sustainability as manifest in Awards received, the government is prepared to give the company an option to expand the mine anytime in the next five years without additional approval or permit requirements. The net present value of the mine and smelter is a negative $400 million. However, the call option to expand is valued at $712 million, resulting in a final NPV of $312 million.

Comment: Enlightening as these translations are, they require a prodigious amount of company-specific research and information to permit development of the SD metrics. The authors note that the reports of even these five selected companies fell short of allowing valuation of 80 to 90% of their reported practices. Still, for selected cases in any industry, these examples may inspire both the corporate analyst who seeks to build a business case for an SD-related decision and the investment analyst (who then presumably issues a Buy advice to her clients, who are ultimately rewarded when the market broadly recognizes the 'hidden' value).

Another reference on how to go about proving the business case:

Donald J. Reed, "Stalking the Elusive Business Case for Corporate Sustainability," *Sustainable Enterprise Perspectives*, World Resources Institute, December 2001, 25 pp.

This is a skeptical, hard-nosed financial analyst's perspective on the business case for sustainable policies. There are critical summaries of a wide range of valuation techniques, a description of four ways of presenting a business case for sustainability (Story Telling, Risk Avoidance, Overall Excellence, Analytical), and examples of conventional techniques (Relative Valuation – a.k.a fundamental analysis – and Discounted Cash Flows) and of emerging techniques (Risk Analysis, Intangible Assets Valuation and Real Options). The author provides a numerical example of a Real Options binomial model. A Figure provides an overview of Strategies (Franchise protection, Process Changes, Product Changes, New Market Development), via associated Business Value, Focus and Main Financial Impact, to what Tools for Valuing are appropriate. Reed believes that the Real Options method shows great promise.

More references on Real Options are provided in Appendix C.

Finally, note that **Five Winds International** *developed a* **Capital Insight – Project Options Assessment Tool**, *designed for use in the early stages of analysis and design of municipal capital project options. The tool supports a comprehensive approach to triple bottom line assessment.*

Sidebar 3 The Business Case for Ecosystems

[Note: References below are in counter-chronological order and are not included in the list of References at the end of this document.]

Aline Chiabai, Chiara Travisi, H. Ding, Anil Markandya and Paulo A.L.D. Nunes, "Economic Valuation of Forest Ecosystem Services: Methodology and Monetary Estimates," Fondazione Eni Enrico Mattei Working Papers, 2009, Paper 272.

Leslie Richardson and John Loomis, "The total economic value of threatened, endangered and rare species: An updated meta-analysis, *Ecological Economics*, vol. 68 (2009), pp. 1535-1548

Damien Bazin, "What exactly is corporate responsibility towards nature?: Ecological responsibility or management of nature? A pluri-disciplinary standpoint," *Ecological Economics*, vol. 68 (2009), pp. 634-642.

Paulo Nunes, Elena Ojea and Maria L. Loureiro, "Mapping of Forest Biodiversity Values: A Plural Perspective," Fondazione Eni Enrico Mattei Working Papers, Year 2009, Paper 264, 28 pp.

Helen Clark, "Paying for Ecosystems," *IPS*, 4 September 2008. (Re two pilot projects in Vietnam by Payment for Ecosystem Services.)

"Paying for the forest - The Amazon," The Economist, 9 August 2008. (Re Brazil's The Amazon Fund.)

Sara Scherr and Seth Shames, Ecoagriculture Partners, "Applying the Ecosystem Approach to Biodiversity Conservation in Agricultural Landscapes." Available at http://www.iisd.ca/mea-l/guestarticle51b.html .

Business & Biodiversity Conference, Outcomes Report, June 11, 2008, 3 pp. Conference presentations are available at http://www.iucn.org/places/canada/downloads.htm .

Canopy Capital, Iwokrama and Global Canopy Programme, "Pioneering investment deal prices 'utility value' of rainforest," press release, 27 March 2008. Ref. http://canopycapital.co.uk .

Also in:

Oliver Balch, "Guyana - Could money really grow on trees?" *Ethical Corporation*, 14 May 2008.

Bryan Walsh, "On the Market: a Whole Rain Forest,", *Time*, 28 March 2008. Ref. http://www.time.com/time .

Daniel Howden, "Million acres of Guyana rainforest to be saved in groundbreaking deal," *The Independent (London)*, 27 March 2008.

Christopher Frey, "Guyana's modest proposal – A South American president surprised his people when he offered to let foreign conservationists manage rain forests in return for aid. A new way to reconcile development and the environment, or a new eco-colonialism?", *The Globe and Mail* - Focus: Science & Ideas, F8, 19 January 2008.

Johannes Ebeling and Maï Yasué, "Generating carbon finance through avoided deforestation and its potential to create climatic, conservation and human development benefits," *Philosophical Transactions of the Royal Society B*, vol. 363 (2008), pp. 1917-1924, published online 11 February 2008.

Also in:

Alister Doyle, "Slowing deforestation may be worth $billions - study," *Reuters*, 7 April 2008.

Barbara Axt, "Reducing deforestation 'lucrative' for forest nations," *SciDiv.Net*, 18 April 2008

WBCSD, Survey of Sustainability Experts 2007-2 Omnibus Questions, GlobeScan Project 3062, 5 February 2008, 18 pp.

Susan Steinhagen, "Safeguarding Natural Value and Building Responsible Markets," (Biodiversity & Ecosystem Services/Asia Pacific Task Force, UNEP Finance Initiative), 2008. Available at http://www.iisd.ca/mea-l/guestarticle54.html .

European Commission, The economics of ecosystems & biodiversity – An interim report, 2008, 64 pp.

WBCSD, "Strengthening the Business - Biodiversity Link in Lisbon," news release, 20 November 2007.

EU, Call for evidence on the economics of biodiversity loss, 14 November 2007, 4 pp.

WBCSD, "Making the Business Case for Ecosystems," news release, 10 August 2007.

WBCSD and IUCN, Business and Ecosystems – Markets for Ecosystem Services - New Challenges and Opportunities for Business and the Environment - A Perspective, September 2007, 20 pp.

PriceWaterhouseCoopers, Sustainable Investments for Conservation - The Business Case for Biodiversity, A study on behalf of the World Wildlife Fund, February 2007, 56 pp.

Geraldine Lambe, "The New Eco-warriors – Can Markets Succeed Where Tree-huggers Failed?" *The Banker*, 1 January 2007, ref. BKNA000020070106e3110000c. *(Note: This article is also relevant for sections 2.4.4 above and 6.4 below.)*

Earthwatch Institute, IUCN, WBCSD and WRI, Business and Ecosystems - Issue Brief - Ecosystem Challenges and Business Implications, November 2006, 56 pp.

Gretchen C. Daily, "Management objectives for the protection of ecosystem services," *Environmental Science & Policy*, vol. 3 (2000) pp. 333-339.

Earthwatch Institute, IUCN and WBCSD, Business & Biodiversity - The Handbook for Corporate Action, 2002, 58 pp.

WBCSD and IUCN, Business and Biodiversity - A Guide for the Private Sector, June 1997, 64 pp.

Note also:

"... a VicSuper venture called 'Future Farming Landscapes' aims to put a value on eco-system services. Farmers will be rewarded, for instance, for efforts that contribute to preserving wildlife corridors. The $40-million project is aimed at generating economic return while preserving the environment." Quoted in ***Globe-Net*****, 16 December 2007** *and referenced in section 6.4.3 below.*

SECTION 5: Reporting

5.1 Corporate Social Responsibility reporting

Corporate Social Responsibility (CSR) is often defined in terms identical or equivalent to triple bottom line language, although some definitions refer to "corporate governance" or "ethics" instead of "social." ([52]) It is somewhat arbitrary to discuss CSR in the Section on Reporting – it could also have been put under general frameworks for more sustainable business conduct (section 2.2). We chose to put it here because much of the literature on CSR is geared towards reporting on what a firm does in the name of CSR.

Industry Canada*'s recently revamped* **Corporate Social Responsibility** *web site provides a general introduction to the subject, historical context, and extensive information and references, both domestic and international.*

Some key references:

Industry Canada, Corporate Social Responsibility: An Implementation Guide for Canadian Business (Cat. No. Iu23-12/2006E; available on the IC web site)**, 90 pp., [2005].**

International Institute for Sustainable Development, Corporate Social Responsibility – An Implementation Guide for Business, Paul Hohnen (author) and Jason Potts (editor), (download from IISD)**, 115 pp., 2007.**

These Guides quote the WBCSD as describing CSR as "the business contribution to sustainable economic development." (pp. 5 and 4 resp.) In style somewhere between a

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[52] *Other definitions include "social" along with "governance" and drop the "economic" pillar – presumably because there is no need to say that corporations have a financial bottom line – as in the acronym "ESG" (environmental, social, governance) already referenced above. Various other terms in use are: Corporate Citizenship, Corporate Responsibility (CR), Corporate Sustainability, corporate stewardship, conscientious commerce, the 3 Es (Economics, Environment, Equity), the 3 Ps (Profits, Planet, People), and more. Ref.:* **Willard (2005: 14-17)**, *referenced in section 4.1 above, and* **Blackburn (2007: 5-7)**, *referenced in section 2.3.2.*

textbook and a manual, they provide a solid overview of CSR and its implementation. Special sections offer some 'adaptation' to small businesses. One lists 36 "Practical CSR activities for small business" (pp. 30-31 and 30-32 respectively).

The Canadian Guide carries date nor author but was published in 2005 by the Office of Consumer Affairs with support from IC's Strategic Policy Branch and with financial support from four other departments. The IISD Guide came out in 2007 and is largely identical except for a new Preface and various modified or additional paragraphs and sidebars. The appendices on CSR organizations and other reference material are much updated. There is no overlap between the "Further Reading" sections in both publications!

Some interesting information about the feasibility of CSR for SMEs can be gleaned from:

Pavel Castka, Michaela A. Balzarova, Christopher J. Bamber and John M. Sharp, "How can SMEs effectively implement the CSR agenda? A UK case study perspective," *Corporate Social Responsibility and Environmental Management*, vol. 11 (2004), pp. 140-149.

An action research case study of an SME that provides training, consultancy and research solutions for businesses, predominantly operating in the UK. Finds that, by integrating CSR into its organizational system, the firm's competitive agenda has been improved. The major benefits were better strategic and resource planning and continued profit growth.

The authors also report on the key findings of a 2002 UK Survey of a representative sample of 200 managers on feasibility of CSR for SMEs. Among the findings are that "Drivers of both initial and continuing SME engagement include personal interest and fulfilment, a desire to implement 'just good business practice', improved morale and motivations, giving something back to the local community and enhancing business reputation." Another finding is that "Fear of bureaucracy, time and cost are the main barriers to further engagement, but ... this is not the experience of most of the SMEs who are engaged. In other words, barriers tend to be built on perceptions rather than reality."

The advantages and disadvantages of both voluntary and mandatory reporting are discussed in:

KPMG and UNEP, Carrots and Sticks for Starters – Current trends and approaches in Voluntary and Mandatory Standards for Sustainability Reporting, 2006, 64 pp.

By way of text tables there are overviews of voluntary, mandatory and global & national assurance standards in a large number of jurisdictions, including Canada. Case studies from Brazil, Denmark, the EU, India, Japan, South Africa and the US follow. The report concludes with some suggested actions for public officials, including a consideration of draft legislation that would stipulate minimum requirements for reporting.

In November 2006, the UK's Environmental Agency commissioned an analysis of the first 100 reports it had received under the new Company Law reporting requirements:

Trucost, Environmental disclosures, for the Environmental Agency, November 2006, 44 pp.

The report provides a broad overview of regulatory and other drivers of disclosure, finds that these first 100 reports are representative of the FTSE universe, and analyzes what it finds in the reports.

Starting in 2009, all 55 state-owned companies in Sweden will be required to file sustainability reports based on the Global Reporting Initiative guidelines. (Source: ***GRI News*****, 3 December 2007.)**

A few older references:

Natural Resources Canada, CSR Lessons Learned: Summary Report [2004?]

There are two parts to the report: the summary report and ten company CSR case studies on which the summary report is based. This was a project funded by the Policy Research Initiative. Success factors for CSR implementation are identified, as is the role of government.

Canadian Business for Social Responsibility, Engaging Small Business in Corporate Social Responsibility - A Canadian Small Business Perspective on CSR, October 2003, 20 pp.

Based on interviews with ten SME managers in five industries, all in British Columbia, all at least ten years in business, with fewer than 50 employees, "interested and engaged" in CSR and all "traditional" businesses. It found CSR resources relevant to small business not readily available and few consulting firms providing services.

Stratos, Sustainability Reporting Toolkit, 49 pp., [November 2003], available at www.sustainabilityreporting.ca .

This Government of Canada web site appears to have remained static since 2003 but is still referenced on both the Stratos and Industry Canada' *Sustainable Development* web sites, under *Corporate Sustainability Reporting*. An 8-page tabular overview of the reporting guidance status in five countries – Australia, Germany, Japan, New Zealand and the United Kingdom – from a November 2002 Toolkit Discussion Paper appears to be no longer available.

The Toolkit essentially covers the same ground as the IC and IISD Guides referenced above, but using sustainability rather than CSR language. Not textbook-style, aims to be practical. No sidebars on SMEs.

Tareq Emtairah, Corporate Environmental Reporting – Review of Policy Action in Europe, International Institute for Industrial Environmental Economics (IIIEE), Lund University, February 2002, 43 pp.

The review covers voluntary reporting practices and mandatory schemes in Denmark, The Netherlands, Norway and Sweden as they began to be introduced in the late 1990s. These countries are not covered in the **Freshfields (2005)** report referenced in section 6.1.1 below.

UN Industrial Development Organization, Responsible Entrepreneurs Achievement Program (REAP), ref. https://www.unido.org/doc/72098 .

One of REAP's goals is "Helping SMEs to practice responsible entrepreneurship, by translating CSR principles into a commercially viable management approach." Practice is emphasized over reporting.

Finally, three references on the relationship between environmental disclosure and financial markets, part of an extensive literature on disclosure, mostly in accounting journals.([53]) This is a segue to the discussion in Section 6, where the context will be what companies have *to disclose, or are increasingly being asked by investors to disclose.*

Walter Aerts, Denis Cormier and Michel Magnan, "Corporate environmental disclosure, financial markets and the media: An international perspective," *Ecological Economics*, Vol. 63 (2008), pp. 643-659.

The authors formulate a 3-stage equation model to simultaneously determine the firm's degree of environmental disclosure, the dispersion of Earnings per Share forecasts by analysts, and exposure in the media for environmental news. These interact with each other and are further determined by product market characteristics, stock market data, and more. They hypothesize that more disclosure will narrow the dispersion in analysts' forecasts; that the linkage will be weaker the more analysts follow the stock; and that the linkage will also be weaker for firms operating in environmentally sensitive industries.

The sample draws from listed companies in eight broad industry groups: 267 located in Europe (France, Germany, Belgium and The Netherlands) and 625 in North America (of which 206 are Canadian). The degree of disclosure (on paper or paper-equivalent, or exclusively web-based) is scored on 39 items in six categories. The data are for 2002. The hypotheses are upheld.

Comment: How the sample is selected is not explained. Some of the data are suspect, e.g.: Capital investment intensity is measured as being lower in the US than anywhere else; concentration of ownership in the US is far lower than anywhere else. Some of the results differ between Europe and North America where no differences

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[53] *E.g., see also:*

- **Ole-Kristian Hope, "Disclosure practices, enforcement of accounting standards and analysts' forecasts accuracy: an international study," *Journal of Accounting Research*, Vol. 41 Issue 2 (2003), pp. 272–273.**

  Using a sample of 22 countries, including Canada, the findings include that analysts' forecasts of earnings per share become more accurate, the more is disclosed and the stronger the disclosure enforcement regime is, especially when few analysts follow the firm. The author is with the Rotman School of Business at the University of Toronto.

- **Paul M. Healy and Krishna G. Palepu, "Information asymmetry, corporate disclosure, and capital markets: a review of empirical disclosure literature," *Journal of Accounting and Economics*, Vol. 31 (2001), pp. 405–440.**

  Disclosure is situated in an information and agency (moral hazard) problem framework. The paper then identifies research questions around the regulation of disclosure; the role of auditors and intermediaries; management choices and incentives; and capital market consequences. Extensive reviews of theory and empirical work in each of these areas follow.

should be expected, e.g.: Why would Number of employees be a significant determinant of media exposure for North American firms but not in Europe, while the reverse would be true for Age of fixed assets? The distinction between mandatory and voluntary disclosure is recognized but not explored. These deficiencies weaken confidence in the results.

Sulaiman Al-Tuwaijri, Theodore E. Christensen and K.E. Hughes II, "The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach," ***Accounting, Organizations and Society*****, Vol. 29 (2004) , pp. 447–471.**

Offers a model that simultaneously seeks to explain economic performance, environmental performance and environmental disclosure, using data for 198 of the S&P500 firms. (One of the conditions for selection is that the firm must generate at least one pound of toxic waste per $10,000 in 1994 revenue. Other conditions relate to data availability.) The results suggest that "'good' economic performance is significantly associated with 'good' economic performance," and also with more extensive disclosure.

One of the stronger findings, agreeing with Clarkson et al. (2007; see below) is that environmental performance relates positively to disclosure – whereas when using Ordinary Least Squares this relationship is not significant. Several other coefficients, however, are not or barely significant.

Comment: The analysis is weakened, among other things, by narrow definitions of the three dependent variables,([54]) rather arbitrary and convoluted constructs for several of the independent variables, failure to make use of the distinction between mandatory and discretionary disclosure, erroneous direction of causality in at least one instance and formulation of some hypotheses that border on the trivial.

Sylvie Berthelot, Denis Cormier and Michel Magnan, "Environmental disclosure research: review and synthesis," ***Journal of Accounting Literature*****, Vol. 22 (2003), pp. 1–44.**

A lengthy review article of research on voluntary and mandatory environmental disclosure, as well as on information outside the firm that could influence investors. As in Healy and Palepu (2001), the conceptual framework is information asymmetry and moral hazard. The authors are with the Université de Moncton, UQAM and Concordia University respectively.

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[54] Economic performance is represented by the change in stock price during the year, relative to the industry median return. Environmental performance is measured by the percent of toxic waste that is recycled – based, not on the TRI data but on data published by the former Investor Responsibility Research Center. A Disclosure variable is constructed using scores for four environmental indicators.

5.2 Drivers and uptake

Is disclosure driven by improved environmental performance or, on the contrary, by the company wishing to justify or explain its poor performance? Here is another contribution by the team of researchers that gave us strong evidence on the Business Case (referenced in section 4.1). Their answer is unequivocal: Good environmental performance and level and quality of reporting go together. But there is some evidence of 'legitimization' behaviour as well.

Peter M. Clarkson, Yue Li, Gordon D. Richardson and Florin P. Vasvari, "Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis," *Accounting, Organizations and Society*, vol. 33, nos. 4-5 (May-July 2008), pp. 303-327.

The authors point out that there are two competing theories about the relation between environmental performance and disclosure: The "voluntary disclosure" hypothesis suggests that companies with "good news" have an incentive to disclose their performance in order to distinguish themselves from rivals with "bad news." The "legitimization" theory, on the other hand, argues that it is companies whose legitimacy is threatened that have an incentive to disclose their performance. The authors also note that mandatory disclosures are not relevant to a test of these alternative theories.

With the assistance of one of the architects of the Global Reporting Initiative, Alan Willis of the Canadian Institute of Chartered Accountants, they constructed their own content index, based on the GRI guidelines. The index is based on a total of 95 line items, grouped in four "hard disclosure" sets of items and three "soft disclosure" sets. "Hard" disclosures are about visible, measurable or concrete things; "soft" measures refer to vision and strategy claims, efforts at attaining an environmental profile and environmental initiatives. Annual reports, special reports and web-based information up to September 2004 were evaluated.

The sample consisted of 191 firms in the five most polluting US industries: Pulp & Paper, Chemicals, Oil & Gas, Metals & Mining, and Utilities. Sixty-nine of these firms scored zero on the discretionary disclosures index.([55])

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[55] The paper does not disclose how the sample was chosen. However, in an e-mail to me, co-author Florin Vasvari explained the selection process:

"1) We have started by selecting all firms in the 4 industries mentioned from the EPA toxic release inventory database. We have aggregated the information provided by EPA (which is at the plant, unit level) to the firm level. We have retained companies for which the environmental performance measures were reliable and relatively stable over the last few years.
2) We have individually investigated the 10k reports of each of these firms to assess whether the firm is a "pure player" in its industry. By pure player I mean companies that have activities only in that particular industry.

Two measures are employed to proxy environmental performance. One is based on a roll-up to firm level of pollution discharge data from the US EPA TRI data base. The first proxy is the rank order of (-)TRI/sales. The second measure is the percent of total toxic waste that the firm treats, recycles or processes (%Recycled). The Pearson correlation coefficient between the two measures is 0.29 and significant but later econometric results suggest that both contribute to the explanation of the variance in discretionary disclosures. When the 122 firms with discretionary disclosures are separated along the industry median of %Recycled, "good performers" obtain significantly higher scores on all "hard" disclosure sets and on one of three "soft" sets. Separation along the median of -TRI/sales yields similar results.

The econometric model's control variables include the amount of capital raised in 2004, Tobin's Q, a measure of stock volatility, total return on assets, the leverage ratio, the ratio of net and gross real capital, and capital spending/sales. Also included was size (asset value), on the theory that there are economies of scale in information production. (Average total assets in this sample were US$3.01 billion.) There are dummy variables for each industry so the results reflect inter-industry variation. (However, a supplementary analysis of intra-industry variation yielded largely similar results, increasing one's confidence in the findings.)

Tobit analysis of the variation in total disclosures and hard and soft disclosures separately, across the 191 firms, and with one or both measures of performance, showed most of the financial control variables to be insignificant; net/gross capital had the wrong sign. However, leverage, size and capital spending/sales were all highly significant in explaining all variations; the amount of capital raised was significant only for soft disclosures. There were industry effects everywhere. The loadings on %Recycled and -TRI/sales were all positive and relatively stable, thus proving the "voluntary disclosure" theory right and the "legitimization" theory wrong.

Still, the authors find validation for the legitimization theory as well: Taking the ratio of soft over total disclosures as a proxy for legitimization behaviour, they find that below-median performers scored 51%, significantly higher than the 34% score of above-median performers. A proxy for media coverage yielded similar results. The relation holds when embedded in the full Tobit model. The results imply "a greater propensity for 'legitimization' behavior for firms whose environmental legitimacy is threatened."

Therefore, we have eliminated companies that have operations in several industries (i.e., conglomerates) – their disclosures are likely to be influenced by factors not related to the industries we focused on.

3) The remaining firms were matched manually with Compustat – the database that provides firm specific financials. Availability of data in Compustat was our last filter.

4) Finally, we have coded the environmental disclosures of these firms: most had environmental disclosures but a group did not have anything reported on the web/social responsibility reports. These final numbers are in the paper."

What is the uptake of CSR reporting practices? Here are four Canadian studies. They demonstrate that the level of uptake among Canadian firms (around 100 by last count) remains extremely low if one considers that there are approximately 3000 enterprises in Canada with more than 500 employees.

Stratos, Canadian Corporate Sustainability Reporting - Best Practices 2008, April 2008, 38 pp., available on the Stratos web site.

This is Stratos' fourth report on the state of sustainability reporting in Canada. Of 379 company web sites examined ([56]), 108 were deemed to be "sustainability reporters," down slightly from 2005 (114); in 2003 100 were found to do so, and only 57 in 2001. ([57]) The companies' reports were assessed on 46 criteria in ten categories. Forty-five were found to reference the GRI framework; only 15% were found to obtain third-part assurance of their reports, half of those by way of stakeholder groups.

In each of the categories, the report then highlights best practices in one or more of seven companies that have consistently scored high: BC Hydro, Enbridge, Suncor, Syncrude, Telus, TransAlta and Vancity. Stratos observes that discussion of materiality, climate change, Aboriginal relations and use of the GRI guidelines are emerging issues.

Natalie Slawinski, Cara Maurer, Tima Bansal and Chris Higgins, Corporate Social Responsibility in Canada – The 2008 Ivey-Jantzi Research Report, Richard Ivey School of Business and Jantzi Research, March 2008, 30 pp.

This is the first of what is promised to be an annual report on CSR practices in Canada. It emanates from the Ivey School's Centre for Building Sustainable Value, home to the Research Network for Business Sustainability ([58]).

The report examines the changes in scores between 2006 and 2007 of the 208 TSX-listed

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[56] Stratos drew on "lists such as the TSX Composite Index, Report on Business Magazine's top 100 companies by revenue and top crown corporations, winners of the Canadian Institute of Chartered Accountants (CICA) corporate reporting awards (sustainable development category), and Corporate Knight's 2007 Best 50 Corporate Citizens."

[57] These 108 are said to be part of the 80% of the 265 companies in the TSX Composite Index as of August 2007 (compared to 70, 60 and 35% in previous years) that included "at least some sustainability information in their annual reports or in a stand-alone report." (p. 4)

[58] The RNBS was introduced in section 2.1.

companies for which Jantzi Research had data ([59]). It finds marginal improvement and more so in the form of expressed intent (policies, programs) than of actual outcomes.

Stratos, Gaining Momentum - Corporate Sustainability Reporting in Canada, December 2005, 41 pp., available on Industry Canada's Sustainable Development web site, under Corporate Sustainability Reporting.

Stratos' third assessment of CSR reporting in Canada. Thirty company reports are assessed in detail. For each of the ten categories of assessment, average scores were found to have increased compared to earlier years.

David Greenall, The National Corporate Social Responsibility Report: Managing Risks, Leveraging Opportunities, Conference Board of Canada, 48 pp., June 2004.

Presents "analysis of the self-assessed CSR management practices of 53 large Canadian companies" and also "reviews the public reporting practices of Canada's 300 largest corporations," using a Corporate Responsibility Assessment Tool developed by the Conference Board and Imagine. (A questionnaire was sent to all 300; 53 responded. The responses were complemented by a comprehensive analysis of publicly available information for all 300 companies. There were also 24 interviews with stakeholders representing public, private and civil society organizations.) The Assessment Tool examines a total of 60 indicators under five dimensions of CSR: Governance and management; human resources; community involvement; environment, health and safety; and human rights. There are cross-walks to the comparable indicators in the GRI.

Two-thirds of the 53 companies issued a CSR report; two-thirds of the Top 300 did not. Positive responses on individual indicators varied greatly.

The most recent global findings on reporting practices capture the nearly 2000 corporations on the FTSE (including 57 Canadian firms) and find that North American practices significantly lag behind those in Europe:

Ethical Investment Research Services (EIRIS), The state of responsible business: Global corporate response to environmental, social and governance (ESG) challenges, September 2007, 96 pp.

Examines the ESG reporting practices of the companies in the FTSE All-World Developed Index. (FTSE is jointly owned by the Financial Times and the London Stock Exchange.) This index contained 1,996 companies as of March 2007, including 57 Canadian companies. Of these Canadian companies, 8 were considered high-risk for human rights issues, 6 as having significant exposure to supply chains and 26 as having high environmental impact. Sources were annual reports, special reports, company web sites, survey responses and non-company sources. Over 60 different social, environmental and governance areas were examined and are discussed under eight headings: Corporate Governance, Equal Opportunities, Human Rights, Supply Chain, Environmental Responsibility, Community Involvement, Nuclear Power, and

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[59] The methodology of Jantzi Research's scores is proprietary. Please refer to *Sidebar 4* following section 6.1 for some further description.

Military Involvement. It finds the drivers of adopting "responsible business practices" to include "regulation, ethical consumerism, brand reputation management, process improvements and responsible investment."

The report also finds that corporate governance practices are converging globally; and that, "Beyond a core of companies which have adopted responsible business practices, North American companies significantly lag behind their European counterparts across all the areas researched." Also: "Australian, New Zealand and Canadian companies do not perform exceptionally on any issues compared to their peers in other countries."

Regarding environmental responsibility the report finds that "European and Japanese companies are clear leaders with respect to managing environmental impacts. Over 90% of high impact companies in Europe and Japan have developed basic or advanced policies, compared with 75% in Australia/New Zealand, 67% in the US and 15% in Asia ex-Japan." The percent for Canada is 84%, meaning that 4 out of the 26 high-impact companies were found to have no policies in place. Canada also scored well on systems, with just two companies found without any. On reporting, however, Canada was among the laggards, with just 14 companies achieving at least a basic level and only two found to be at an advanced level of reporting.

The 36% of companies world-wide that were found to have achieved at least a basic level of environmental policies, systems and reports represent 49% of the value of the index, suggesting that large companies are more likely to have adopted such practices. Just under ten percent rated an advanced level of reporting. Among the 720 high-impact companies, over 50% have adopted policies or systems but still only 15% achieved an advanced level of reporting.

The report also examines whether the companies have improved their environmental performance. Of the 482 high-impact companies that reported on this, 11% demonstrated major improvement; they represented 21% of the Index' market capitalization, again suggesting that the companies reporting the most improvement tend to be larger.

Regarding supply chains: "Over 50% of European companies have adopted a basic or advanced supply chain policy where relevant, however less than 20% of North American companies and less than 10% of Asian companies have done the same."

Every three years since 1993, KPMG and the University of Amsterdam have published the results of their international survey on Corporate Responsibility reporting. The most recent report was

issued in October 2008 and became available too late for annotation.([60]) The earlier report in this series was:

KPMG International Survey of Corporate Responsibility Reporting 2005, June 2005, 52 pp.

In the 2005 report the survey is of the top 250 Fortune 500 companies (ranked by revenue) and the top 100 companies in each of 16 countries, including Canada; these sets are referred to as G250 and N100 respectively. The majority of reports date from calendar year 2003. It found 64% of the G250 and 41% of the 1600 N100 companies to have issued Corporate Responsibility (CR) reports, either separately or as part of an annual report, up significantly from comparable sets in the 2002 survey. Canada's was exactly the group average, at 41%, more than double the 2002 uptake. Only 32 of the top 100 US companies qualified.

Among the G250, top drivers for CR reporting were found to be economic and ethical considerations, innovation and learning, employee motivation, and risk management or risk reduction. Forty percent used the GRI framework as their guide. Thirty percent of the G250 included an external assurance statement; among the N100 the percent was 33, up from 27% in 2002. Only four out of 41 Canadian companies included an external assurance statement, up from two in 2002 – still better than US companies, where only 1 of 32 went externally for assurance.

Four other recent reports on uptake:

- Interbrand and Business Week, *in the* August 7, 2007 *issue, report that 80% (12) of the top 15 global brands release reports detailing economic, environmental and social performance, and that most use metrics developed by the GRI. Forty-three percent of the top 100 brands also issue similar reports. (Source:* ***GreenBiz.com*****, 2 August 2007.)**

- *The* Social Investment Research Analysts Network (SIRAN) and KLD Research & Analytics *of Boston, in their "*2008 S&P 100 Sustainability Report Comparison,*" found that 86% of S&P's 100 index had corporate sustainability web sites and about half produced a sustainability report, compared to 58% and 39% respectively in 2005. (Source:* **Greenbiz.com, 22 July 2008[2].)**

- *SIRAN and KLD's previous (third) annual report had found that, in 2005-06, of the companies in the S&P 100 Index, 49 had issued ESG reports, 11 for the first time. Of these, 38 had used the GRI Guidelines. (Source:* ***Environmental Finance*****, 26 April 2007.)**

- **Stephanie Maier, FTSE100 snapshot: Trends in ESG performance, EIRIS, n.d., 4 pp.** *examines the performance of the top 100 firms on the FTSE over the years 2003-2007 on about a dozen subjects covering environmental, social and governance matters. It finds over the years progress in some areas, no progress in others and that "a small minority of companies continue to demonstrate poor performance." (See also* **Anne Moore Odell,** ***SocialFunds.com*****, 28 May 2008.)**

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[60] **KPMG International Survey of Corporate Responsibility Reporting 2008, October 2008, 118 pp.**

Finally, two related special topics:

- Corporateregister.com, *in* "Assure View: The CSR Assurance Statement Report," *projects that nearly 3000 companies worldwide would be publishing some type of corporate non-financial report, but only a quarter of them also plan to have their reports verified by a third party. (Source:* **Anne Moore Odell, *SocialFunds.com*, 21 August 2008**.)

- **Coro Strandberg**, *for the* Conference Board of Canada, *produced a report,* **The Role of the Board of Directors in Corporate Social Responsibility, (June 2008, 44 pp.)**, *based on document research and surveys of 28 Canadian and international "thought leaders" and 18 Directors. (The lists of interviewees are in appendices.) The report discerns a trend toward increased board oversight of a firm's ESG performance and calls this a critical success factor. While it finds current practice limited, it expects "CSR governance" to become mainstream in the years ahead.*

5.3 Global Reporting Initiative

The Global Reporting Initiative (GRI - ref. **www.globalreporting.org**) *started out as an initiative of* CERES, *the coalition of investors and public interest organizations. In 2002 GRI became a Foundation with headquarters in Amsterdam. The GRI offers a Sustainability Reporting Framework with at its core a set of* **Reporting Guidelines**. *A third generation of the Guidelines (***G3***) was released in October 2006. There are also Indicator Protocols and a growing number of Sector Supplements. Some 1000 businesses in over 60 countries follow this framework.*

The GRI's vision is that "reporting on economic, environmental, and social performance by all organizations is as routine and comparable as financial reporting." The Guidelines' Principles regarding the contents of a report cover Stakeholder inclusiveness, Completeness, Materiality, and Sustainability context. Principles regarding the quality of reporting are about Accuracy, Balance, Comparability, Clarity, Timeliness and Reliability. Another section of the Guidelines deals with disclosures – about company profile, response to risks and opportunities, governance structures and organizational approaches to managing specific issues. Yet another part deals with Performance Indicators in five areas, a total of 47 in the G3 core, as well as guidance on the Indicator Protocols.

GRI asks that reports using its Framework declare the level to which they have applied it, choosing between "C,", "B" or the full "A" level, with a "+" at any level if the report is externally assured. Report makers may contact GRI to have it check which level applies.

GRI also offers Learning Services. Its first publication was **The GRI Sustainability reporting cycle: A handbook for small and not-so-small organizations, n.d.,** *for sale for €50.00 in English and €100.00 in French. It purports to be a "step-by-step handbook providing expert guidance on the whole SME sustainability reporting process."*

In September 2006, Canada's Social Investment Organization (more about SIO in section 6.3 below) called upon the federal government to make GRI-style reporting mandatory for all federally incorporated publicly traded companies (ref. **Eugene Ellmen, *Corporate Knights*, Vol. 5.3 [Urbanization Issue 2007], p. 37.***)*

5.4 Carbon Disclosure Project

The Carbon Disclosure Project (CDP - ref. **www.cdproject.net**) *is an independent not-for-profit organization of institutional investors. It aims to develop data that support a dialogue between shareholders and corporations regarding the implications of climate change. In 2007, its members and signatories represented 315 investor groups managing assets of US$41 trillion. The project's Canadian partner is the Conference Board of Canada. In February 2007 the Project launched its 5th annual survey, sent to the 2400 largest corporations in the world by market capitalization, including 194 Canadian companies. Some 1300 corporations answered – a response rate of 54%. Among Canadian companies, 47% responded. Responding companies covered off 77% of the FT Global 500 by value ([61]) and 56% of the S&P500. The results of 'CDP5' were made public at the World Economic Forum in Davos and are described in two reports. One summarizes the overall results and focuses on the FT500. The other reviews the results for the S&P500:*

Innovest Strategic Value Advisors, Carbon Disclosure Project - Report 2007 - Global FT500, issued 24 September 2007, 174 pp.

The CDP questionnaire covers GHG emissions as well as GHG management and how the company is dealing with climate change. Among responding companies, 79% of the FT500 and 53% of Canadian companies disclosed their GHG data (CO_{2e}). Based on these and other responses companies are assigned a score. The report lists those who scored 85% or more, along with Innovest's proprietary Carbon Beta™ rating.([62]) Throughout the report the results are summarized, studded with illustrations naming specific companies. Appendices provide company-specific data on emissions and other responses to the survey. Ten sectors are analyzed in detail.

In its conclusion, the report admits that many investors have not yet fully integrated climate change considerations into their decision making process. (CDP's 4th report had estimated that about 0.1% of invested assets was managed with systematic consideration of carbon research.) Yet, the report asserts,

> Climate change and the various regulatory, policy and business responses to it are driving what amounts to a worldwide economic and industrial restructuring. That restructuring has already begun to redefine the very basis of competitive advantage and financial performance for both companies and their investors.

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[61] *In 2007, there were 23 Canadian companies in the FT Global 500.*

[62] More on Innovest's Carbon Beta™ rating in section 6.2.2 below.

RiskMetrics Group, Carbon Disclosure Project - Report 2007 - USA S&P500 , issued 24 September 2007, 80 pp.

Of responding companies in the S&P500, 65% provided emissions data; most agreed to make the data public. Here too, the results are illustrated with reference to specific companies. In addition, there is a stronger overtone of advocacy throughout the report. The Foreword summarizes eight "guest commentaries" – 2-page essays on topics such as the science of climate change, that more disclosure is needed, that sea level rise is putting coastal development at risk, what Congress should legislate on climate change, etc.

The report concludes that American industry still lags behind its international competitors, not only in responding to the CDP survey but also in turning climate awareness into action to reduce emissions. "Material effects of climate change remain largely undetermined and undisclosed." Carbon pricing "is rarely factored into capital investment decisions." Yet, the report asserts, "Companies that are ahead of the curve support mandatory, market-based policies to achieve emissions reductions" so as to have "greater certainty in their investment planning decisions" and exploitation of new business opportunities.

Also in 2007, the CDP became the secretariat for a new organization, the Climate Disclosure Standards Board, *a seven-member consortium of business and environmental organizations convened by the World Economic Forum in January of that year.([63]) The Board's mission is to create and promote a generally accepted framework for reporting on "climate risks and opportunities, carbon footprints and carbon reduction strategies and their implications for shareholder value."*

In August 2008, 21 US cities, including New York and New Orleans, announced that they will begin using CDP's methodology to report on their greenhouse gas emissions. (Source: ***AFP*****, 11 August 2008.)**

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[63] *Details about this new Board are highlighted on page 15 of the S&P500 report and are buried deep in the FT500 report, on page 91.*

5.5 Scorecards and Awards

Global 100 *offers a scorecard of how well companies are doing on SD. Global 100 is a project of* Corporate Knights *and* Innovest Strategic Value Advisors Inc. *Launched in 2005 and annually released at the World Economic Forum at Davos, it rates companies on their "abilities, relative to their peers, to manage the environmental, social and governance (ESG) risks and opportunities they face." The 2007 list was published in* Corporate Knights, Vol. 5.3, Urbanization Issue 2007, pp. 40-41. *(See also* www.global100.org *) In the 2008 list, 32 firms of 2007 were dropped; new additions include a private equity firm and Rio Tinto. Five Canadian companies made it on the 2008 list.*

Corporate Knights *also publishes a ranking of the* Best 50 Corporate Citizens. *The 7th annual ranking appeared in* Vol. 7.1, Best 50 Issue 2008, pp. 14-24. *The rankings are based on environment, social and governance indicators found in the public domain, including many sector-specific indicators and pollution.*

In 2007, VanCity won the 6th annual **CERES-ACCA North American Award for Sustainability Reporting**. *Mountain Equipment Co-op won an award for Best First-Time Report. (Source:* Canada NewsWire, April 12, 2007.*) 2008 winners were Ford and Timberland. (Source:* GreenBiz.com, 1 May 2008.*)*

The Climate Group *is a non-profit organization with offices in the UK, the USA, China, India, and Australia. It was formed in 2004 by a diverse group of companies, governments and civil society organizations. The Group is "focused on supporting businesses on the path to a low carbon economy." Members include many banks but the only Canadian member company is Alcan Inc. Government members are the Cities of London, UK, and New York, five US and two Australian states, and three Canadian provinces (Manitoba, Ontario and Quebec). In October 2007 in the UK, the Group launched a* Climate Brand Index, *which will track "year-on-year consumer perceptions of how brands are performing on climate change." Currently, the research finds "a gap between what consumers want and expect from brands on climate change and what they think they are doing about it." This initiative is related to the Group's 'Together' campaign, launched in April 2007, which brings together 10 of the UK's top brands and aims to make it easier for consumers "to make a positive difference on climate change in their everyday lives." (Ref.:* http://theclimategroup.org.*)*

Successfully piloted in 2005, Royal Dutch Shell in the UK offers a **Shell springboard program.** *Up to six prizes of between £20,000 and £40,000 are awarded to small businesses "who submit the most compelling plans for a product or service which helps combat climate change." Applicants must be set up as a sole trader, partnership, limited company or community interest company, have been established for a minimum of 3 months and have fewer than 250 employees. Over the past two years, judges on three regional panels have assessed applications from more than 450 small businesses. They are looking for business plans for a product or service which*

"will lead to greenhouse gas reductions; are commercially viable; and are innovative." (Ref.: http://www.shellspringboard.org.*)*

In 2008 **SAM, in collaboration with PricewaterhouseCoopers,** *launched its fourth* Sustainability Yearbook. *SAM is headquartered in Switzerland and calls itself the "leading investment group for sustainability investments;" it had CHF8.5 billion under direct management in 2007. Each year since 1999, it has assessed 1000 companies in 57 sectors on the basis of company-specific sustainability criteria. The top 15% in each sector are included in the Yearbook. The 2008 Yearbook introduced Gold, Silver and Bronze ratings of the winners. (See also* Anne Moore Odell, SocialFunds.com, 5 February 2008.*)*

Finally, in June 2008 **Ethisphere Magazine**, *in collaboration with Forbes, published its second annual list of the* World's Most Ethical Companies. *It examined 10,000 global companies and selected 93 based on ratings in seven categories. (It also produced a chart showing that its set of 93 achieved stock price growth well above the S&P500.) One Canadian company, Petro-Canada, made it on the list. Fifty-one companies were based in the US, raising some suspicion about the representativeness of the sample of 10,000. (See also* Anne Moore Odell, SocialFunds.com, 16 June 2008.*)*

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SECTION 6 Do Capital Markets Value Sustainability?

In Section 4 we discussed the Business Case for sustainability, that is, whether adopting more sustainable practices is profitable. In this Section, we review whether capital markets reward firms that are more sustainable (or punish those less sustainable). These rewards could come in the form of higher stock prices or lower cost of capital. Nothing specifically has been found on the latter, but there is a significant literature on the link between sustainability and stock prices. In this context, "sustainability" is most commonly translated as the firm's response to "ESG" issues – environmental, social and governance, an acronym we already encountered in Sidebar 1 and elsewhere.

Building on the discussion of disclosure in sections 5.1 and 5.2, we first review the legal requirements for disclosure of relevant information, in Canada and abroad. A Sidebar notes sources and networks for ESG-related information. The next section distinguishes three types of analytical studies, in addition to review studies. A brief run-down of sustainability-related indexes and funds follows. Finally, we look at investment practices – the Principles of Responsible Investment, the CPP's Policy on Responsible Investment, and more. Initiatives by venture capitalists and private bankers are also briefly referenced. We close with a number of publications on the problem of stock market short-termism.

6.1 On relevant information

6.1.1 Defining fiduciary duty

To this day one hears it said that the fiduciary duty of professional fund managers is to maximize returns for their clients and that they should not take into account how firms score on ESG issues when making investment decisions. This theory was laid to rest by a 2005 report from a leading international law firm commissioned by the Asset Management Working Group of UNEP's Finance Initiative:

Freshfields Bruckhaus Deringer, A legal framework for the integration of environmental, social and governance issues into institutional investment, produced for the Asset Management Working Group, UNEP Finance Initiative, October 2005, 154 pp.

After an exhaustive legal analysis covering Australia, Canada, France, Germany, Italy, Japan, Spain, the UK, the US, the European Union and International regimes, the study concludes that,

(1) if the purpose of the fund is returns on investment, then this must always remain the primary objective;
(2) failing to take into account ESG factors may be a breach of fiduciary duty;
(3) the weight given to ESG factors is at the discretion of the investment decision maker.

Another finding is that there are no provisions in civil law prescribing a particular level of profitability – i.e., staying short of maximizing returns is not illegal.

The report puts great emphasis on a misunderstood UK court decision, *Cowan v. Scargill* (1984), noting in particular that it is most often referred to in Canada as establishing the standard of care required of pension trustees. The judge in the case took the unusual step of revising his judgement five years later, explaining that it does not support the thesis that profit maximization alone was consistent with fiduciary duty.

Description of Canada's regime occupies seven pages of small print, plus eight pages in an Appendix. Federal regulations and those of Ontario, Alberta and Manitoba are covered. (The discussion of the CPP Investment Board's policy predates adoption of the Board's new policy, described in section 6.4.2 below.)

6.1.2 The concept of materiality

If investment managers have a duty to consider ESG information, are firms obliged to disclose it? The answer lies in the concept of materiality. For example, section 75 (1) of the Ontario Securities Act *on Continuous Disclosure states that "where a material change occurs in the affairs of a [listed firm], it shall forthwith issue and file a news release authorized by a senior officer disclosing the nature and substance of the change." More generally, to quote the Handbook of the Canadian Institute of Chartered Accountants (CICA, par. 1000.17),*

> An item of information, or an aggregate of items, is material if it is probable that its omission or misstatement would influence or change a decision. Materiality is a matter of professional judgement in the particular circumstances.

CICA prepared a Background Paper for the National Round Table on the Environment and the Economy on the issue of disclosures:

Canadian Institute of Chartered Accountants, Financial Reporting Disclosures about Social, Environmental and Ethical (SEE) Issues, Background Paper for the National Round Table on the Environment and the Economy, Toronto, November 2004, 43 pp.

The paper provides a comprehensive review of corporate reporting requirements to capital markets and identifies Management's Discussion and Analysis (MD&As) as the most appropriate vehicle outside financial statements to convey disclosures about "SEE" issues.([64]) The roles of the external auditor, the audit committee and the board of directors are also discussed, as is the continuous disclosure process.

(In an Appendix, the paper describes in some detail the role of the **Canadian Securities Regulators (CSA)**, an umbrella organization formalized in September 2003. For example, CSA developed National Instrument 51-102 for continuous disclosure obligations, which was adopted by each provincial regulator in 2004. Besides the data base of MD&As and other public filings, CSA also has a central database on insider holdings and trading. Its permanent Secretariat opened in March 2004 in Montreal. CSA is a member of the **Joint Forum of Financial Market Regulators** which, in addition, comprises insurance regulators and pension supervisory authorities.)

The purpose and requirements under National Instrument 51-102 and their relevance for SEE-related disclosures are set out in detail, as are the requirements under other filings such as

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[64] All securities regulators require the filing of MD&As, at least annually. They are accessible on the web site of the Canadian Securities Regulators.

financial statements, information circulars and the Annual Information Form.

See also:

Canadian Institute of Chartered Accountants, MD&A: CICA Guidance - Executive Summary, Canadian Performance Reporting Board, pages 9 to 14, May 2004.

The guidance document states the five key elements of CICA's disclosure framework in an MD&A: the company's vision, core business and strategy; key performance drivers; its capabilities; results, historical and prospective; and the risks that may shape and/or affect achievement of results.

Canadian Institute of Chartered Accountants, MD&A Disclosure about the Financial Impact of Climate Change and other Environmental Issues – Discussion Brief, Canadian Performance Reporting Board, 14 October 2005, 21 pp.

References the Guidance and suggests specifics related to climate change and environmental disclosure. An Appendix contains selected excerpts of National Instrument 51-102 with required disclosures.

Canadian Institute of Chartered Accountants, Climate Change and Related Disclosures - Executive Briefing, 23 April 2008, 16 pp.

Declares that

> Climate change is a pressing global issue. At a company level, it is also a business and shareholder value issue, affecting strategy, risk management and financial performance.

Puts five questions to CEOs and CFOs. The briefing concludes that

> Determining the company's greenhouse gas emissions and potential exposure to the effects of climate change are ... essential first steps. Leadership in addressing and acting on climate change sooner rather than later may in various ways create competitive advantage for a company.

There are a number of references to further sources of information and guidance.

Altogether, one could conclude that companies now have a fair amount of guidance on what they should disclose to the investor and the regulator. Yet, we saw earlier that sustainability-related reporting is still far from having become mainstream, particularly in North America. In very large part, the gap between theoretical ideal (and legal obligation!) and observed practice may be attributed to the lack of consensus on metrics and reporting format. The Ontario Securities Commission (OSC) *expressed its displeasure in a Staff Notice issued on February 27, 2008. The Notice reports its findings after a review of environmental reporting by 35 "issuers":*

OSC, Environmental Reporting, Staff Notice 51-716, news release issued February 27, 2008, 7 pp.

OSC staff reviewed 35 reporting issuers for whom the OSC is the principal regulator. Of these, 22 were listed on the TSX and 13 were "venture issuers."([65]) Issuers reviewed were from "environmental services, industrial products, mining, oils and gas, steel, transportation services, or utilities" but there is no further information about the sample or how it was chosen.

The review discusses environmental liabilities, asset retirement obligations, financial and operating effects of environmental protection requirements, environmental policies fundamental to operations, and environmental risks.

In its comments the Notice repeatedly notes that "boilerplate disclosure is insufficient." Often, staff describes one example of reasonable disclosure and then contrasts it with all others that fell far short. Under Environmental Risk the Notice finds that "Four of the 22 issuers did not address environmental risks as a risk factor, despite being in an industry where environmental risks appear to be relevant." Like CICA, the Notice points to the MD&A and/or the Annual Information Form as the place to disclose Environmental Liabilities, adding that this should be done "whether or not the liability has been accrued in the financial statements or has been disclosed in the notes to the financial statements."

Comment: With little known about the sample, and no information on the extent to which the specific aspects of disclosure are applicable to any of the firms, the degree of non-compliance is difficult to discern. Still, the overall impression is that Canadian companies have a long way to go in providing adequate disclosure regarding environmental matters. Perhaps most importantly, this Notice is, in the words of one lawyer, "a shot across the bow ... directed at companies, their CEOs, CFOs and audit committee members." (Source: **Sandra Rubin, *The Globe and Mail*, March 19, 2008**.)

A final reference is on a more theoretical plane, yet has practical implications for the regulation of disclosure:

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[65] From the Notice's footnote:
A "venture issuer" is defined in NI 51-102 as a reporting issuer that, as at the applicable time, did not have any of its securities listed or quoted on any of the Toronto Stock Exchange, a U.S. marketplace, or a marketplace outside of Canada and the United States of America other than the Alternative Investment Market of the London Stock Exchange or the PLUS markets operated by PLUS Markets Group plc.

Michael D. Guttentag, "Accuracy Enhancement, Agency Costs, and Disclosure Regulation," *Review of Law and Economics*, Vol. 3, Issue 2 (2007), 31 pp.

The author distinguishes between two kinds of information to which a regulator's disclosure rules may be applied: (1) accuracy information – defined as any information that would affect the stock price, and (2) agency information – information about management's compensation and managers' transactions with the company that does not also affect the stock price.

The paper then develops an algebraic social welfare analysis of a regulator's disclosure policy. Among its conclusions are: gains from regulatory disclosure will be greater when the firm's investors are unsophisticated or large in number; welfare gains are largest for disclosure of information for which inter-firm externalities are large, that is, when the cost of disclosure is offset by benefits to other firms; and gains are greater in a robust securities market.

Sidebar 4: Information providers

Several initiatives aim to meet the "ESG" information needs of investment analysts. Some we have already met:

- *the Carbon Disclosure Project, now in its sixth year (section 5.4);*
- *CERES, which spawned the Global Reporting Initiative (sections 2.4.3.1 and 5.3);*

Other sources:

- **oekom research** *(ref.* www.oekom-research.com *) is an "independent rating agency for success stories in sustainable investments." Based in Muenchen, Germany, it began its rating project in 1994. Currently, over 750 companies are rated on their corporate responsibility – social & cultural (staff & suppliers, society & product responsibility, corporate governance and business ethics) and environmental (environmental management, products & services, and eco-efficiency). Rated firms cover about 80% of the market capitalization value of the firms included in the MSCI World Index ([66]). Coverage of firms in Dow Jones indices is 90 to 100%. Using a 5x5 grid, weights of the social/cultural and environmental components vary depending on their relevance in any given industry. On each of 30 criteria a company is given a rating. In addition, a negative screening is applied based on 12 "controversial business areas" and six "controversial business practices." In the end a company is given a rating on a 12-point scale, from A+ to D-, using a best-in-class approach. Two studies using the oekum ratings are referenced in section 6.2.2.*

- **Innovest Strategic Value Advisors** *(ref.* www.innovestgroup.com *) was founded in 1995; it has offices in New York, London, Toronto and Paris. Its* EcoValue'21® *ratings have been developed using 5-year back-tests (December 1996-December 2000) on over 350 Fortune 500 companies. The database now covers over 1200 companies globally.([67]) The rating model evaluates a company's historical liabilities, operating risks, future risk exposures, capacity to manage environmental risk (environmental competence) and ability to position itself to profit*

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[66] *"As of June 2007 the* **MSCI World Index** *consisted of the following 23 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States." All companies in the Index (about 1900) are large or mid-cap. The top ten Canadian companies in the Index as of June 2007 were Northern Telecom, BCE Inc, Royal Bank of Canada, Thomson Corp, Seagram Co, Canadian Imperial Bank, Bank Nova Scotia, Bank Montreal, Canadian Pacific and Newbridge Networks Corp. (Source:* **www.mscibarra.com** *.)*

[67] *Source:* **Derwall et al. (2005:54)**, *reviewed in section 6.2.2 below.*

from environmentally driven opportunities (environmental opportunity). Both quantitative and qualitative data are employed. Data are converted into a relative, best-in-sector score. The scores are then fed through a scoring matrix which adjusts the weights of each category through back-testing with the Fortune 500 companies. In the end, companies obtain a score on a 7-point scale, from AAA to CCC. Innovest's reports are referenced in sections 6.2.1 and 6.2.2.

- *At the Global Compact Summit in July 2007,* **The Goldman Sachs Group** *(ref.* www2.goldmansachs.com *) introduced its* GS Sustain *focus list of global companies in four mature sectors: energy, mining, steel, food & beverages, and pharmaceuticals. To make it on the list, a company must score well on a combination of its ESG rating and industry positioning; this must then translate into improved financial performance. Its ESG framework covers corporate governance, leadership, employees, stakeholders and environment, using 20 to 25 quantifiable indicators of which 2/3 are universal and 1/3 are sector-specific. (Areas such as human rights, human capital management, local waste & water management and biodiversity are left out because there are not enough quantifiable and comparable data.) The weights of each category vary by sector. Seventy stocks in these sectors are analyzed and 17 qualify (none Canadian) The analysis also covers European media and emergent industries (alternative energy, environmental technology and biotechnology). For backcasting results on this set of companies, see section 6.2.2.*

- **KLD Research & Analytics** *(ref.* www.kld.com *) is headquartered in Boston and, since 1988, offers investment research integrating ESG factors.([68]) Its database covers more than 4000 companies (of which 3000 are US-based) in over 50 global markets. Ratings are derived based on environmental factors, community relations, corporate governance, diversity, employee relations, human rights, and products & services. Screens for ten controversial business issues (covering 55,000 companies in the global publicly traded universe) also may be applied.*

- **Jantzi Research** *(ref.* www.jantzisocialindex.com*) maintains a Canadian Social Investment Database™ with environmental, social and governance ratings of approximately 300 Canadian companies and income trusts, including all companies in the S&P/TSX Composite Index. Jantzi's rating methodology is not published, however. ([69]) Coverage of thousands of US companies is in cooperation with KLD Research & Analytics. Other international*

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[68] *KLD stands for Kinder, Lydenberg, Domini.*

[69] *A brief description is found in* **Slawinski et al (2008:29)**, *annotated in section 5.2. Firms are scored on over 100 proprietary indicators covering "community and society, corporate governance, customers, employees, the natural environment, and human rights." The scoring is based on industry-specific best practices. Their relative weight is also industry-specific and within-industry comparisons are said to be the most valid.*

coverage is achieved in cooperation with European-headquartered Sustainable Investment Research International (SiRi) Company.

Several academic studies have used the KLD and Innovest ratings to measure the link with stock market performance.([70]).

While these investment research firms (except Jantzi) disclose at least to some extent the methodology used to arrive at their ratings, all SRI-type indexes or funds of course employ some selection method. These products are referenced in section 6.3 below.

Other organizations, networks or initiatives promoting better sustainability-related investment research include:

- *the* **Enhanced Analytics Initiative (EAI**; *ref.* www.enhancedanalytics.com), *an "international collaboration between asset owners and managers aimed at encouraging better investment research, in particular research [on] the impact of extra-financial issues on long-term investment." Membership "is open to institutional investors and asset managers who commit to allocate individually at least 5% of their brokerage commissions to extra-financial research." Its web site explains that these extra-financial issues generally have one or more of the following characteristics:*

  1. they tend to be qualitative and not readily quantifiable in monetary terms (e.g. corporate governance, intellectual capital)
  2. they relate to externalities not well captured by market mechanisms (e.g. environmental pollution)
  3. they relate to wider elements of the supply chain (e.g. suppliers, products and services)
  4. they are the focus of public concern (e.g. GMOs)
  5. they have a medium to long-term horizon (e.g. global warming)
  6. the policy and regulatory framework is tightening (e.g. greenhouse gas emissions)

  The Initiative was launched in October 2004. As of mid-2007, EAI had 25 members with assets worth US$2.4 trillion under management. Five of the members are based in North America, including Canada's CPP Investment Board and Bâtirente, a C$700 million retirement fund and one of the original 24 subscribers to Principles for Responsible Investment (PRI – see section 6.4.1 below).

- *The* **Institutional Investors Group on Climate Change (IIGCC**; *ref.* www.iigcc.org) *is a forum for collaboration between pension funds and other institutional investors (including charitable trusts) on issues related to climate change. As of February 2008 it had 40 members, mostly from the UK (none Canadian).*

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[70] **Waddock & Graves (1997)** *used the KLD ratings – see section 4.1.* **Derwall et al. (2005)** *and* **Gluck & Becker (2004)** *used Innovest's – see section 6.2.2 – as did* **Guenster et al. (2006)** *– see section 6.2.3.*

- *The* **Investor Network on Climate Risk (INCR**, *ref.* www.incr.com *) is a network of US institutional investors and financial institutions that "promotes better understanding of the financial risks and investment opportunities posed by climate change." It is coordinated by CERES and was launched in 2003. As of February 2008 it had 60 members managing over $4 trillion of assets.*

Guidance of a different nature is provided in:

The Investor Environmental Health Network and Rose Foundation for Communities and the Environment, Fiduciary Guide to Toxic Chemical Risk, March 2007, 52 pp.

Four chapters discuss: The Hidden Costs of Toxic Exposures; Risks to Shareholder Value from Corporate Toxic Chemicals Policies; Toxic Chemical Risk and Fiduciary Duty; and Addressing Toxic Chemicals: A Road Map for Fiduciaries. This last chapter (by Jane Ambachtsheer of Mercer Investment Consulting) is "a comprehensive set of directions to guide investors in assessing and documenting their own understanding of the relationship between toxics and financial risk, and exploring these issues with investment managers and consultants." An Appendix offers a prototype Investor Inquiry Letter to companies regarding corporate safer chemical policies.

6.2 Analyses

Analysts have used a wide range of approaches to investigate the relationship between "ESG" factors and stock market performance. We selected 20 studies for annotation under the following subheadings ([71]):

6.2.1 portfolio or scenario simulations;
6.2.2 backcasting studies;
6.2.3 economic and other models; and
6.2.4 review studies.

A final subsection signals a number of sector-specific studies.

6.2.1 Portfolio or scenario simulations

On behalf of a major US public pension fund, Innovest in 2002 performed live, real-time simulations based on six actual investment portfolios:

Innovest Strategic Value Advisors, <u>New Alpha Source for Asset Managers: Environmentally-Enhanced Investment Portfolios</u>, Executive Summary, April 2003, 10 pp.

The contributing value of Innovest's EcoValue21® environmental performance ratings was tested in two ways. One of the Fund's portfolio managers used the ratings in his investment algorithm, where they had a weight of about 20%. This portfolio outperformed the S&P500 benchmark by 1.5 percentage points over ten months in 2002.

Secondly, live simulations of the portfolios of six other managers ("shadow portfolios") were performed for all of 2002, using the ratings overlay and a portfolio optimization model with the 'volume' of the Innovest signal set to three different levels. The portfolios were adjusted every quarter. For five of the six portfolios, the Innovest ratings almost always improved investment return and the improvement was always greater the more weight was given to the ratings. The improvement ranged from -0.04 percentage points (the only case of negative incremental return) to 1.58 points. The sixth portfolio turned out to be unsuitable for the simulation exercise.

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[71] *We leave aside event studies – impact on stock prices stemming from the release of toxic emissions data, for example, or from an incident that brought the company into disrepute, or, stemming from good news such as winning an award. For a brief overview of what such studies have found, see* **Guenster et al. (2006:5)**, **Derwall et al. (2005:53)** *and* **Repetto and Austin (2000:4)**, *all annotated further in this section.*

The UK's Carbon Trust ([72]) performed a hypothetical analysis of another kind:

Carbon Trust, Climate change and shareholder value, London, March 2006, 38 pp.

The study develops a "robust, replicable approach" to analyzing shareholder value at risk from climate change; opportunities are also explored. Based on 2004 data for ten 'case study companies'([73]), the potential impact of a potential 2013 emissions regulatory regime on profits is analyzed – a 70% free emissions allowance, and a carbon price of £20 per tonne of CO_2. Assumptions are made about pass-through of marginal cost increases and the impact of non-EU emissions is analyzed under two scenarios. Both direct and indirect impacts on EBIT are considered – impact stemming from its own energy use, profit impact after regulatory and market dynamics, and profit impact after secondary effects. The paper spells out a 4-step generic "Value at risk methodology" and provides a worked example for the chemical sector. In the end, only Building Materials and Bulk Commodity Chemicals are found to have value at risk in excess of 10% of EBIT; Logistics comes close. Industrial Gases and Water Utilities gain in value, Supermarkets and Hotels & Leisure break even, and Electricity Generation, House Building and Food Production suffer small negative exposure. Various sensitivity tests are performed.

A third simulation study covering a range of industries is from the Australian office of Citigroup:

Bruce Rolph and Elaine Prior, Climate Change and the ASX100 – An Assessment of Risks and Opportunities, Citigroup Global Markets - Equity Research – Strategy In-Depth, Australia, 30 November 2006, 126 pp.

The study develops four scenarios, two related to carbon trading (limited/widespread) and two to physical impacts of climate change (gradual/sooner). Enough information was available for 48 ASX100 companies to assess their risk/opportunity exposure under these scenarios. Winners and losers are identified, for the near- and the longer term.

The scenarios are worked up in great detail, with associated policy discussion. Individual company scores on all components of the scenarios are provided and discussed.

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[72] *The Carbon Trust is an independent, business-led, government-funded company set up in 2001. It is tasked with working directly with UK companies of all sizes to help reduce carbon emissions. Ref.* www.thecarbontrust.co.uk .

[73] In some cases, a 'case study company' was a single company. In others, data for a single company division were used. In yet others, data from several companies were combined to form a representative firm. The data set comprised ten sectors, five with relatively high and five with relatively low carbon intensity.

Finally, an earlier scenario-building exercise, with financial data for 13 US pulp and paper companies:

Robert Repetto and Duncan Austin, Pure Profit: The Financial Implications of Environmental Performance, World Resources Institute, Washington, D.C., 2000, 59 pp.

The authors develop three regulatory and three fiber supply scenarios which they distill into scenarios A and B, with associated probabilities. Regulatory issues are about NO_x emissions, waste water treatment and contaminated sediments; fiber supply issues relate to state & local regulations, the Endangered Species Act and recycled fiber price scenarios. These carefully reasoned and extensively documented scenarios are then applied to financial and geographic data from 13 US pulp and paper companies (identified by a letter only). Company data for each element of the scenarios are provided. The financial analysis appears to have been performed over the 1998-2010 period.

The salient outcome is that the financial exposure to prospective environmental issues, in percentage of their current market value (expressed as most likely value, as well as probable ranges), varies greatly between companies. One company is expected to increase its value under the scenarios and a few are expected to lose a few percentage points. At the other extreme, three companies are expected to suffer losses over 10% of current value. Overall probability results are provided for selected companies. They show, for example, that company "C" with probabilities in a narrow range between -7 and -1% comes out significantly better than company "K" with probabilities ranging from -23 to +2%..

Figure 9: US pulp & paper companies' aggregate financial exposure to environmental issues

Like other writers, the authors are vexed by the question why these differences are not factored into market valuations. They believe that this kind of information is simply not available to investors and complain that most financial reports provide few if any clues. Indeed, at the end of the report, in a brief foray into comparing their results with price-earnings ratios, they find strange anomalies. E.g., companies "B" and "H" have similar expected losses (less than 1% of current market value) and variances (also less than 1%) but B's P-E ratio is 37 while H's is 14. Companies "I" and "L" also have similar expected losses (around 6%), with the variance around I's at 6.9%, and around L's at 2.4%. Yet I's P-E ratio is 60 while L's is only 27. Bringing better information to investors was of course the objective of the study.

Comment: Like **Yachnin (2006)**, reviewed in section 4.2, a prodigious amount of research was required to develop and apply these scenarios, however simplified. In this case, two years of research included, in the words of the authors, "digging in obscure, though public, data sources." The subsequent application of the scenarios into the financial analysis required a

cascade of further assumptions and estimates. In all but the most knowledgeable hands, such methods can rapidly descend into speculation.

Overall, one may conclude from these studies that not all firms have the same risk exposure and that ESG information can help identify winners and losers, but that the market does not yet necessarily recognize these relative vulnerabilities.

6.2.2 Backcasting studies

Backcasting studies apply a sustainability rating to companies and then examine over some historical period whether in the stock market highly-rated firms perform better than lower-rated ones or better than some benchmark. Apart from the quality and scope of the rating scheme, the studies differ in the degree of sophistication of the models: What other influences are filtered out? One of the most carefully conducted studies is:

Jeroen Derwall, Nadja Guenster, Rob Bauer, and Kees Koedijk, "The Eco-Efficiency Premium Puzzle," *Financial Analysts Journal*, vol. 61, no. 2 (2005), pp. 51-63.

The authors matched all stocks in the CRSP stock data base ([74]) for which Innovest has EcoValue21® ratings and compared the stock performance of the top 30% (measured by total capitalization) with the bottom 30% over the period July 1995 - December 2003. The comparison is net of:

- risk, as captured in a capital asset pricing framework;([75])
- investment style (small cap vs. large cap);
- growth vs. value (measured as the ratio of book value over market value);
- momentum (winners & losers over the previous 12 months); and
- an industry adjustment factor, obtained through a principal components analysis.

Each June the firms were re-ranked and the two portfolios were rebalanced.

The high-ranked portfolio was found to outperform the low-ranked portfolio by 6.04% per annum (return on industry-adjusted Difference portfolio). All but the Momentum variable received significant loadings. Robustness tests considered alternative portfolio

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[74] The **Center for Research in Security Prices (CRSP)** is part of the Graduate School of Business at the University of Chicago. Its data base comprises US stocks and Treasury bonds. Ref. www.crsp.com .

[75] The capital asset pricing model (CAPM) describes the relationship between risk and expected return. Ref. www.investopedia.com .

construction methods, alternative return metrics and the impact of the 2000 market crash. All turned up consistent results. When only firms in sensitive sectors were considered (electric utilities, chemistry, metal & mining, paper & forest products, aerospace & defense, and petroleum), the "alpha" dropped to 4.47% but remained significant.

Finally, the analysis considered a best-in-class approach, popular with many social investment funds. Again the results held up, with the differential "alpha" now at 5.96% at zero transaction costs, rising from 6.02 to 6.23% for 50 to 200 basis points of transaction cost.([76])

The paper makes no claim to causality, being concerned only with the long-term correlation of environmental ratings and investment returns. To explain what to the true CAPM believer is a "puzzle," the authors suggest that the eco-efficiency premium is "a mispricing story."

A more recent study by Innovest's own analysts:

Innovest Strategic Value Advisors, Carbon Beta™ and Equity Performance – An Empirical Analysis – Moving from Disclosure to Performance, October 2007, 35 pp.

The paper starts with the observation that publicly disclosed information about emission levels is not good enough for investor decision making. A comparison of Leaders and Laggards as measured by the Carbon Disclosure Project from June 2004 to June 2007 turned up virtually the same Total Return.

Instead, a "Carbon Beta™ Rating Platform" is proposed, the details of which are proprietary. (Presumably this is a variant of the EcoValue21® ratings developed by Innovest and made available to other researchers. The end result appears to be similar: company ratings on a scale "from AAA (best in class) to CC (worst in class).") In general terms, the four key variables are potential risk exposure, ability to manage and reduce risk, ability to recognize and seize climate-driven opportunities, and the rate of improvement or regression. The platform is applied to over 750 companies world-wide in six high-impact sectors (electric utilities, construction materials & building products, oil, gas & consumable fuels, paper & forest products, chemicals, and machinery & industrial conglomerates). Exposure to risk and opportunity is examined along the entire value chain – upstream, internal and downstream. Geographic carbon risk profiling and compliance costs are captured in yet other proprietary algorithms.

Companies' exposure ratings are applied "live," distinguishing this study from a static back-cast. Comparisons between leaders and laggards control for regional and sector effects by re-weighing the sector and geographic composition of the laggard portfolio to match that of the portfolio of leaders.

The overall result is that, between June 2004 and June 2007, leaders (ratings of BBB or better) outperformed laggards at an annualized rate of 3.06%, as measured by Total Return. Among US and Canadian companies only, the leaders-laggards differential was 2.40%. Among European companies it was 6.60% but in the Asia-Pacific region the differential was a *negative* 4.45%; the authors explain the latter result by pointing to the fact that carbon emission reductions "do not yet prevail" in that region so that those who *are* ahead of the curve are being financially penalized.

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[76] Transaction costs were high due to the high turn-over rates in the worst-of-class portfolio.

Among utilities, the leader-laggard differential is 16.02%. In the materials sector it is 5.41%. Results for the other sectors are not reported.

Comment: The various proprietary components of the analysis and the lack of detailed description of other aspects of the study methodology make it difficult to evaluate the results. (E.g., the authors state: "In order to isolate the possible existence and size of any 'carbon risk premium', the impact of other, more traditional investment factors was eliminated through quantitative techniques." That would never make it in a peer-reviewed journal.) In addition, the companies are not described – even the sample size is variously described in the report – nor is the ratings scale, except to say that it runs from AAA to CC and that the BBB or better rating of the "leaders" means they are "investment grade." An Appendix with some statistical data reveals that the differential between leaders and laggards is significant at a 95% confidence interval in the utilities sector only!

An older but somewhat more transparently reported study, also using the Innovest ratings:

Kimberly Gluck and Ying Becker, <u>The Impact of Eco-Efficiency Alphas on an Actively Managed U.S. Equity Portfolio Performance</u>, State Street Global Advisors, Boston, MA, February 2004, 14 pp.

Kimberly Gluck and Ying Becker, "Can environmental factors improve stock selection?", Guest Editorial, *Journal of Asset Management*, vol. 5, no. 4 (2004), pp. 220-222.

The authors use the S&P500 stock universe as their benchmark (large caps only). The period studied is January 1998 to April 2003. They employ a proprietary investment model, "primarily a linear combination of factors categorized in the areas of value, earnings estimate sentiment, price momentum pattern, and earnings quality." The baseline "alpha" scores are then "tilted" – from +2 for securities with the highest Innovest rating to -2 for those with the lowest EcoValue21® scores. A second test does the opposite, adding a positive tilt to the lowest scores and a negative one to the highest ones. A third test adds a tilt only to the stocks rated at the top and bottom. The portfolios are rebalanced monthly. The impact of investment style is investigated using a proprietary "Beta123 risk model."

Over the period, the baseline Alpha yielded an annual return of 1.10%. The first test resulted in an annual return of 3.60%, the third 3.72%; the reverse test (tilt 2) came up with a negative 0.11%. The S&P500 over that period returned -1.56%. Controlling for style, the enhanced returns when adding the Innovest scores are somewhat diminished but remain positive (at 1.72%, 2.83% and 3.36% for baseline, tilt1 and tilt3 tests respectively).

The authors conclude that **adding environmental ratings as an investment criterion can add significantly to stock market returns.**

Ratings produced by oekum research have been tested in two studies:

HypoVereinsbank and oekum research, What yield can a sustainable portfolio be expected to generate in the long term?, Munich, September 2007, 17 pp.

William Baue, "Morgan Stanley Study Correlates Sustainability with Financial Outperformance," *Institutional Shareowner News*, December 5, 2003 (ref. www.institutionalshareeowner.com).

The 2007 study covers the period 31/12/2000 to 31/12/2006. Two tests were performed. First, a portfolio consisting of large-cap "leaders" (best in class) was compared with the MSCI World Index. The leaders' portfolio comprised 140 securities initially, rising to 219 at the end. The leaders' portfolio outperformed the World Index in each of the six years – less negative in 2001-2002, significantly better in 2003-2004 and 2006, a slight edge in 2005. Cumulatively, oekom's portfolio yielded 36%, while the MSCI World Index ended up negative 24%.

A second test compared the same "prime" portfolio with a "not-prime" universe of companies rated by oekum whose corporate responsibility rating was "poor" – 206 securities initially, 530 at the end of the period. Here the results were more mixed: almost equally negative in 2001-2002, significantly better in 2004 and 2006, and slightly worse in 2003 and 2005. Cumulatively, the prime portfolio outperformed the not-prime portfolio by 16 percentage points.

Comment: The published report contains few additional details. Apart from the proprietary ratings, characteristics of the model – if there is one – are not revealed.

The 2003 study with Morgan Stanley was for the period 31/12/1999-27/10/2003. Of the 602 companies in the MSCI World Index covered by oekum ratings, 186 were judged to be sustainability leaders in their respective sectors. Portfolio performance of these 186 was compared with that of those not preferred. The leaders were found to have outperformed the laggards by a cumulative 23.39%. The leaders outperformed the World Index by 3.76%.

This information is gleaned from news coverage. The 2003 study is no longer available on the internet.

With its GS Sustain focus list Goldman Sachs also claims to have found the key to better investment decisions:

Anthony Ling, Sarah Forrest, Marc Fox and Stephan Feilhauer, Introducing GS Sustain, Global Investment Research, Goldman Sachs Group Inc., 22 June 2007, 179 pp.

Abby Joseph Cohen, Capital markets at the crossroads – Sustainable investing: Environmental focus, prepared for the Clinton Global Initiative Annual Meeting, September 2006, 21 slides.

Industries covered include global energy, mining & steel, food & beverages, pharmaceuticals and European media. Whether across sectors or within sectors, the analysts find no correlation between ESG factors alone and financial metrics or stock market performance. Detailed analysis, however, turns up findings such as: when top sustainability is maintained for three years, then the market is willing to bestow a premium for competitive advantage, capping out at about 20% ; and payroll per employee correlates *positively* with cash flow per employee.

Backcasting produces the following premiums in performance of the companies on the list compared to the sector and the market respectively: energy, since October 2006 - 19%, 7%; mining & steel, since July 2006 - 66%, 49%; European media, since February 2006 - 10%, 12%. Stocks on these lists outperformed the MSCI World Index by 25% since August 2005. The food & beverages list was published in February 2007 and pharmaceuticals in May 2007 – too recently for a meaningful backcasting performance check.

The report concludes that

> companies need to manage all inputs to their business in order to enjoy sustained competitive advantage and a valuation premium versus their peers. What is more profound, perhaps, is that investors cannot rely on ESG factors alone but need to integrate them into an industrial framework and valuation methodology to pick stocks. (p. 47)

Comment: Picking stocks for strong ESG *and* strong financial performance would appear to guarantee that this portfolio outperforms the market and its peers. However, GS Sustain aims to "focus on a longer time horizon and holding period. There will be low turnover in the list." It is therefore too early to declare Goldman Sachs' methodology a success. Prodigious research underlies the pick of these stocks on the GS Sustain list, and the intent is to expand to other sectors.

Abby Joseph Cohen is with Goldman, Sachs & Co. Until March 2008 she was its chief forecaster for the US stock market.

In a downturn as well, sustainability-focused companies appear to do better:

Daniel Mahler, Jeremy Barker, Louis Besland, and Otto Schulz, 'Green' Winners – The performance of sustainability-focused companies during the financial crisis, AT Kearney, 2009, 4 pp.

The authors compare the 99 companies that are part of either the DJSI or the Goldman Sachs Sustain focus list, or both, with the market index performance. They find that over the 3-month period September-November 2008, the performance differential was 10%; over the 6-month period May-November, it was 15%.

Finally, and shifting from portfolios of individual company shares to portfolios of mutual funds, here is a study of Equity Mutual Funds performance in the US, originally written in 2003, revised in 2005 but not published to date. Using data from 1963 to 2001, it offers a dissent:

Christopher C. Geczy, Robert F. Stambaugh and David Levin, "Investing in Socially Responsible Mutual Funds," October 2005, 55 pp.

The study adopts a Bayesian approach to optimal portfolio building. What it costs you to invest in SRI funds depends on your point of view: Are you a true believer in the capital asset pricing model (CAPM, i.e., you invest in market indexes), or do you believe that a mutual fund manager has some, much or infinite ([77]) skill in pursuing strategies? Allowance is also made for no, 1% or 2% mispricing under CAPM. Using this range of parameters, increasingly complex models are tested: pure CAPM, a 3-factor model (CAPM plus small/large cap plus high/low market-to-book-value performance differentials) and a 4-factor model (adding Momentum).([78])

Starting with the 3,545 domestic equity funds in the CRSP data base over the period July 1963 - December 2001, the final 'universe' consisted of 894 no-load funds that had at least three years' worth of data. Of these, 34 were found to apply one or more of 20 negative, positive or mixed screens and were the candidate "SRI" funds.

The result is that when one believes in a pure CAPM and has no belief in skills then choosing SRI funds yields about the same performance as an unconstrained portfolio. But as one allows for management skills, and as one admits more complex factors, the price one pays for investing in SRI funds becomes steeper. For example, if you believe that there is a 10% probability that a manager can add at least 3.5 percentage points to the performance of your portfolio, and you believe that the 3- or 4-factor model is at work, you give up about 1.5 percentage points per month by choosing SRI funds. Allowing for CAPM mispricing makes little difference.

Various other strategies were tested such as partial allocations, allowing funds with loads, only allowing funds with "sin" screens (no alcohol, tobacco, gambling etc.) and only allowing funds that are commonly accessible (non-institutional funds with a minimum investment requirement of at most $2,500). Under this last restriction, 569 funds in the universe and 23 SRI funds were candidates and the penalty was much reduced: In the example cited for the main result, the SRI investor would now give up only about 0.7 percentage points per month (still not an insignificant price). In these and all results, tables provide full disclose on the allocation to funds and their identity.

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[77] In the latter case, the investor believes that the track record of a manager perfectly predicts her future decisions. Results under this option are wild: an SRI investor would give up about 15 percentage points per month!

[78] One will recognize this as similar to the model employed by **Derwall et al. (2005)** discussed at the start of this subsection, but Derwall used Innovest ratings for individual companies and controlled for industry sector.

Comment: The most striking aspect of this paper is its point of departure: Investing in socially responsible companies costs you. This may reflect the times of the data. As almost all more recent studies annotated here indicate, companies are finding that increasing corporate sustainability is profitable (section 4.1) and the stock market is rewarding them (this section). One would expect today's SRI-type funds to perform accordingly.

Save for this one exception, these backcasting studies provide strong evidence that there is a sustainability premium for companies that score high in ESG ratings.

6.2.3 Economic and other models

There are four studies under this heading. The first two examine both return on assets and stock market returns. We already encountered both in section 4.1 and annotated the second one there because of its emphasis on operational returns.([79]) We review the first one here because of its emphasis on shareholder value.

Nadja Guenster, Jeroen Derwall, Rob Bauer and Kees Koedijk, "The Economic Value of Corporate Eco-Efficiency," August 2006, 33 pp.

This as yet unpublished paper is by the same team that authored **Derwall et al. (2005)**, discussed in section 6.2.2 above. Innovest data (US firms) are brought to bear against return on assets (ROA) and a form of Tobin's Q ([80]) by running 32 quarterly regressions of a cross-section of companies over the period 1997-2004. The number of firms in any regression is reported only for five cross-sections, when it is seen to vary between 154 (December 1996) and 519 (September 2004). As a variant to using Innovest's full eco-efficiency score, the authors use dummies for firms that score highest (5 or 6) and lowest (0 or 1).

Regressions on ROA or Q, or else on ROA or Q minus the industry median ROA or Q, or on their respective logs, are run without and with controlling for sectors and trimming for outliers. The control variables for the regressions on ROA are leverage and either book value of assets or sales; and for the regressions on Tobin's Q they are 2-year sales growth, firm age

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[79] **Weber et al. (2005)**, *annotated in section 4.1. As regards Total Returns per share, based on data for 100 companies world-wide, the paper found no significant relationship with sustainability performance.*

[80] Here measured as the sum of the book value of assets and the market value of the common stock, minus the sum of the book value of common stock and deferred taxes reported on the balance sheet, all divided by the book value of assets.

(counting from day first traded or 1984, whichever is later), size (log of book value of assets) and ROA. In robustness checks, other control variables for the regressions on Tobin's Q are: R&D spending (scaled by sales), interaction between R&D and sales growth, and a dummy variable for listing on the NASDAQ (to account for "the stock market hype of the late nineties").

The results reported are averages of the coefficients obtained in the 32 cross-sectional regressions. To these averages t-statistics are attached in imitation of Fama and MacBeth (1973).([81]) **For both ROA and Tobin's Q, in all variants, a clear positive relationship with the Innovest scores is found.** When distinguishing between low- and high-scorers, a strong negative relationship between low scores with ROA remains, while the evidence for a positive relationship with high scores is weaker. The negative relationship between Tobin's Q and low scores also holds, and the positive relationship with high scores is stronger. The difference between the loadings for high- and low-scores is always very significant.

Control variables with significant loadings are leverage and book value of assets for the ROA regressions, and size and ROA for the Tobin's Q regressions, while results for sales growth and firm age are mixed. In the robustness checks, sales growth sinks into insignificance when R&D x sales growth is introduced, and the NASDAQ dummy is very significant.

In the Tobin's Q regressions, the paper also divides the sample period into 1997-2000 and 2001-2004. This reveals that the difference between low- and high-scorers triples in the second period. That change in the strength of the relationship is confirmed when looking at the pattern over time of the coefficients obtained in the 32 regressions: The annual percent change is positive and significant in all variants reported, suggesting that the stock market only slowly incorporated environmental performance information. This in turn of course would suggest that investors can exploit this mispricing.

Comment: These regressions appear to be run on most but not all of the firms in the Innovest database; the paper does not explain how the subset was chosen. More worrisome is that, while strong results are obtained, one has to wonder what the meaning is of averages over a varying set of firms – with the number more than tripling over time, is the nature of the set changing? If so, are these changes controlled for? In other respects, as well, both the ROA and the Tobin's Q models appear to be underspecified. Finally, they attempt to translate results obtained from ordinal data (the Innovest ratings) into quantitative impacts on operational or stock market returns. (These attempts were not annotated above.) As the authors themselves recognize, this is treading on dubious grounds.

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[81] **E.F. Fama and J.D. MacBeth, "Risk, Return and Equilibrium: Empirical Tests," *Journal of Political Economy*, vol. 81 (1973), pp. 607-636.**

Here is a study that takes a very different approach: It seeks to determine to what extent reputation for good environmental behavior explains the value of intangible assets of a firm: ([82])

Shameek Konar and Mark A. Cohen, "Does the market value environmental performance?", *The Review of Economics and Statistics*, Vol. 83 No. 2 (May 2001), pp. 281-289.

The approach is to see market value as the sum of the value of tangible and intangible assets. "Intangible assets are factors of production or specialized resources that allow the firm to earn profits over and above the return on its tangible assets."

From the definition of Tobin's Q (market value over replacement value)([83]) it is easy to derive the ratio of intangible over tangible assets (equal to Q - 1) – the dependent variable in the paper's main results. Alternatively, the dependent variable is specified as the log of Q.

Explanatory variables are: R&D and advertising expenditures (both scaled by replacement value; in a variant, interaction between these expenditures and growth in revenue is allowed); market share or, alternatively, the 4-firm concentration ratio at the 4-digit SIC level; 2-year sales growth, 2-digit level imports over industry value of shipments, age of plant assets, net investment (scaled by replacement value), toxic chemicals released (scaled by revenue), and the number of environmental law suits against the firm. Other control variables are size (measured as the log of replacement value), and dummies for 2-digit level industries, plus interaction terms between the industry dummies and both R&D and advertising expenditures. (Results for the latter two sets of variables are not reported.)

The paper used cross-sectional data for 1989 of the S&P500 but without firms in "non-polluting industries (primarily banking and insurance)" – 321 firms, mostly in manufacturing. After further elimination due to data restrictions, the sample ends up consisting of 233 companies.

Size, R&D and advertising expenditures, market share (which correlates highly with concentration ratios), growth in revenue, toxic releases and number of lawsuits received significant loadings with the expected signs in all variants of the model; age of assets, net

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[82] *For a thorough discussion of intangibles, especially as they relate to innovation, see* **Baruch Lev, Intangibles - Management, Measurement, and Reporting, Brookings Institution Press, Washington, D.,C., 2001, 216 pp.**

[83] More precisely: the market value of equity, debt and preferred stock, divided by the replacement value of plant, equipment, inventory and short term assets.

investment and import penetration never did. Results for some of the control variables were mixed when the interaction terms were introduced but the toxic release and lawsuits variables remained stable.

Next the authors regressed intangible asset values directly on the same explanatory variables and obtained very similar results (except that the size variable switched to positive and R&D expenditures were no longer significant). Notably the toxic releases and lawsuits variables remain strongly significant and negative.

Finally, the paper made a calculation of the loss in value associated with poor environmental performance, particularly toxic releases. ([84]) The average "liability" (intangible asset loss) was calculated to be $380 million per firm, or 9% of the replacement value of assets. Naturally, the number varied greatly across industries, ranging from 1% in food products and petroleum & coal to 31% of replacement value in chemicals.

The authors believe that they have made a contribution to answering the question why firms go beyond compliance in improving their environmental performance: The marketplace rewards them.

Comment: One wishes this approach were applied with a more comprehensive measure of sustainable behaviour. Also, the switch in the role of the replacement cost of tangible assets ("size") when intangible assets are taken to be the dependent variable remains essentially unexplained.

Another earlier study, with focus on multinational mining and manufacturing companies in the S&P500:

Glen Dowell, Stuart Hart and Bernard Yeung, "Do Corporate Global Environmental Standards Create or Destroy Market Value?", *Management Science*, vol. 46 no. 8 (August 2000), pp. 1059-1074.

The sample period is 1994 to 1997. The data source for environmental ratings are the 1994-1997 Corporate Environmental Profiles from the Investor Responsibility Research Center (IRRC; ref.: http://www.irrc.org/). The ratings are based on a self-declared 3-way categorization: whether the corporation adheres to local standards only, whether it applies US standards wherever it does business, or whether it has its own standards that exceed any national standard.

Only those multinationals who had operations in countries with a GDP per capital below $8,000 were selected, a total of 89 firms. The dependent variable is Tobin's Q, here defined as the ratio of market value over

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[84] In the process the paper reveals that the lawsuits variable takes on significance primarily in chemicals and miscellaneous manufacturing; and in the latter the data are dominated by a large number of lawsuits against two firms. The lawsuit coefficient is in the order of -0.16, while the toxic releases coefficient is in the order of -94.00.

replacement cost of tangible assets. The proxy for market value is stock market capitalization, plus book value of long term debt and net current liabilities. Replacement cost is proxied as net value of physical plant & equipment plus book value of inventory.

Other independent variables included in the model were: R&D intensity, advertising intensity, long term debt, percent foreign assets (all scaled by total assets) and firm size (measured as log of total assets). Including dummy variables for industry effects affected the size of the coefficients but not the overall results.

The R&D and Advertising variables obtained strong loadings, as did the size variable when industry effects were included. Leverage and %Foreign turned up insignificant. The results for the correlation with self-declared standards were consistent in all variants of the model: Firms that impose their own higher standards globally have higher Tobin's Q than firms that adhere to local or US standards; whether firms adopt US or local standards makes no significant difference. An attempt to determine causality (using lags and residual analysis) led to insignificant results, likely because only 17 out of 89 firms changed their classification over the period.

The paper concludes that adoption by multinationals of a stringent global environmental standard is not a liability that depresses market value. However, companies with lower market values may be engaged in a race to the bottom.

Comment: An annual check against one of three options regarding what environmental standards a company adheres to does not have much information value. This weakens the significance of the results. An explanation of cross-sectional differences of intangible assets also seems less than complete.

While each of these studies has its weaknesses, the general thrust of their findings is, again, that there is a positive relationships between environmental ratings and stock market performance.

6.2.4 Review studies

National Round Table on the Environment and the Economy, Capital Markets and Sustainability – Investing in a sustainable future, State of the Debate Report, February 2007, 72 pp.

This State of the Debate report is part of the NRTEE's Capital Markets and Sustainability Program. Over two years, a 17-member Task Force met with about 200 people (identified in an Appendix) in five regional and multi-stakeholder meetings; commissioned six papers (four of which are summarized at the end of the report; these were used in ten further consultations across the country); and participated in the development of the UN's Principles for Responsible Investment ([85]) initiative. The NRTEE Policy Advisor to the Task Force was David Myers.

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[85] PRI. See section 6.4.1 below.

The report is an amalgam of observations, literature review and polemic, all in pursuit of an answer to the question: "What can Canada do to encourage capital markets [to] catch up" with other developed countries in integrating sustainability into economic decisions, and "also gain a sustainable competitive advantage." Further on, the questions are said to be whether there is a financial return for the pursuit of corporate responsibility policies; and whether pursuit of such policies is rewarded by capital markets.

The report observes that

> the majority of large publicly traded Canadian corporations have *not* yet integrated sustainability policies, programs, standards, indicators, or audited reporting into their normal operating procedures...

and that, notwithstanding the 2005 Freshfields report, ([86])

> many fiduciaries in Canada continue to be advised by counsel that consideration of ESG factors is in general conflict with their fiduciary duty.

The report recommends that federal and provincial governments adopt regulations requiring pension funds to disclose to what extent ESG factors are considered in selecting investments and in proxy voting; and issue guidelines clarifying that fiduciary duty includes consideration of ESG factors.

There are separate chapters on Fiduciary Duty, Materiality, and Short-termism, with a discussion of Barriers/Considerations, Desired Outcomes, and Recommendations for each. There is an odd Foreword, in effect a commentary by four "contributors," expressing views not necessarily reflecting those of the Task Force; indeed, two of its members are identified as disagreeing with the inclusion of this Foreword. Main new points made by the contributors are that no additional capital market regulations are called for; that there is no shortage of capital in Canada; and that Canada's marginal taxes on capital and labour are almost twice as high as in the US.

Note that a conflict between sustainable conduct and profitability is premised on the belief that reduced profit results when ESG factors are given more attention. Most of the research, some decades old, has found that the opposite is true. Still, in certain sectors with high environmental or social impact (mining and consumer products sourced in Third World countries, for example), a delay in profit may be necessary due to heavy investments or major process changes. We'll discuss the phenomenon of short-termism further in section 6.4.4.

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[86] Annotated in section 6.1.1 above.

From the NAFTA-related Commission for Environmental Cooperation:

John T. Ganzi, Eric Steedman & Stefan Quenneville, Linking Environmental Performance to Business Value - A North American Perspective, 2004, 80 pp., available from the web site of the Commission for Environmental Cooperation. **Executive Summary, 10 pp.,** IC Library no. HC120.E5 G3613.

The authors reviewed about 100 research studies (to September 2003) on the business value case for sustainable practices and conclude that a positive, or at least a neutral, correlation between environmental and financial performance is indicated, but that the specific mechanisms or causal links have not been identified. The information to do so is generally lacking. The language of environmental risks, liabilities and opportunities is not aligned with the lexicon of financial performance.

"...North American financial institutions, industrial firms and governmental agencies are, by and large, not pro-actively supporting the link between environmental and financial performance." In contrast, European leadership in CSR has resulted in banking and institutional investors actively working on the development and application of environmental business value metrics. In North America, the Socially Responsible Investment (SRI) community has been a key driver but SRI comprises only 3.3% of financial assets in Canada (11.3% in the US).

The paper concludes with an 8-point role for the public sector. The authors are a former Citicorp VP and Salomon Brothers manager, a former portfolio manager at Dreyfus and a Montreal-based business strategy consultant respectively.

Finally, three review studies from UNEP's Finance Initiative which, in large majority, confirm a positive relationship between stock prices and ESG factors.

UNEP Finance Initiative (Asset Management Working Group) and Mercer, Demystifying Responsible Investment Performance - A review of key academic and broker research on ESG factors, October 2007, 82 pp.

An introduction by the Working Group succinctly summarizes the evolution that 'responsible investment' has gone through: from negative screening, to positive screening or a best-in-class approach, to today's practice which is

> premised on the belief that ESG factors can enhance financial performance and should therefore be integrated into investment analysis and decision-making, including ... shareholder activism/engagement...

The report captures 20 academic and 10 broker studies published between 1995 and 2007, some of which are also annotated in this document. Only three studies find a negative

relationship between stock performance and ESG factors, 13 find a positive relationship and the remainder has mixed or neutral results.

UNEP Finance Initiative (Asset Management Working Group), Show Me The Money: Linking Environmental, Social and Governance Issues to Company Value, 2006, 55 pp.

Financial analysts from 12 brokerage houses around the world submitted a variety of reports, mostly in the form of company assessments. The reports are available on the UNEP web site, but here the US firm CRA RogersCasey offers highlights and key comments. The intent is to show how ESG issues are material to security pricing and portfolio performance.

UNEP Finance Initiative (Asset Management Working Group), The Materiality of Social, Environmental and Corporate Governance Issues to Equity Pricing, June 2004, 53 pp. Also a CEO Briefing, 6 pp.

Summary of 11 reports by brokerage houses on specific sectors. No North American houses responded positively to the call for studies. All reports suggest that ESG factors are important for both short and long term valuation.

Lloyd Kurtz, *a Research Fellow at the Center for Responsible Business at the Haas School of Business, University of California at Berkeley, has a web site,* **www.sristudies.org** *, containing reviews of 17 studies on the relationship between social/environmental and financial (stock market) performance published between 1993 and 2006, and more.*

See also **Peloza and Yachnin (2008)** *and related RNBS publications, reviewed in section 4.2, which draw lessons from 128 studies published between 1972 and 2008; these include those reviewed by* **Margolis & Walsh (2001)**, *annotated in section 4.1.*

6.2.5 Sector-specific studies

We merely signal here some additional sector-specific studies on the link between financial performance and sustainable behaviour or environmental risk:

Miranda Anderson and David Gardiner, Climate Risk and Energy in the Auto Sector - Guidance for Investors and Analysts on Key Off-balance Sheet Drivers, CERES, April 2006, 24 pp.

Citigroup Global Markets, Towards Sustainable Mining - Riding with the cowboys, or hanging with the Sheriff?, Global Portfolio Strategist, 14 March 2006, 112 pp.

Robert Repetto, Silence is Golden, Leaden and Copper - Financial Disclosure of Material Environmental Information in the North American Hard Rock Mining Industry, prepared for the Commission for Environmental Cooperation, Executive Summary - 40 pp., 2004. (Includes summary of ten case studies.)

Duncan Austin, Niki Rosinski, Amanda Sauer and Colin le Duc, Changing Drivers - The Impact of Climate Change on Competitiveness and Value Creation in the Automotive Industry, World Resources Institute, 1 October 2003, 84 pp.

Robert Repetto and J. Henderson, "Environmental exposures in the US electric utility industry," *Utilities Policy*, vol. 11, no. 2, June 2003, pp. 103-111.

Duncan Austin and Amanda Sauer, Changing Oil: Emerging environmental risks and shareholder value in the oil and gas industry, World Resources Institute, 1 July 2002, 44 pp.

6.3 Sustainability Indexes and Funds

Over the last several years a large number of "socially responsible" funds have come on the market in Canada. **Corporate Knights**, *in its* **2007 Cleantech Issue**, *rated 47 of them. Fifty percent of CK's score derived from the funds' 1- and 3-year performance, the other 50% from five subscores related to engagement, disclosure, etc.*

The Canadian Association for Socially Responsible Investment (better known as the **Social Investment Organization - SIO***; ref.* **www.socialinvestment.ca***) has five members: Acuity Funds, Alterna, Ethical Funds, Inhance, and Meritas. Meritas markets Jantzi's Social Index fund, composed of the 60 best companies in Jantzi's Canadian Social Investment Database™. RBC Asset Management markets a series of RBC Jantzi funds.*

In Fall 2007 TD launched a Global Sustainability Fund *and Scotiabank began offering a* Scotia Global Climate Change Fund. *Other recently launched 'green' mutual funds are* Jhov Winslow Global Green Growth, Investors Summa Global Environmental Leaders and Criterion Global Clean Energy, Investeco Global Environmental Sectors, *and* Kyoto Planet Fund. *(Source:* **Shirley Won, *Globe and Mail*, 5 February 2008**. *See also* **Marlene Habib, *Globe and Mail*, 27 February 2008**.*)*

In March 2007, **SIO** *reported on "A comprehensive survey of socially responsible investment in Canada":* **Canadian Socially Responsible Investment Review 2006 (43 pp.)**. *It found that $57 billion was invested in "Core SRI" assets, a 52% increase from two years earlier. The survey also covered "Broad SRI" – investments where the asset managers or pension funds employed ESG considerations, also including sustainable venture capital. This broad category amounted to $446 billion. These amounts make up 2.2% and 17.4% respectively of the estimated total assets under management in Canada. (See also* **Anne Moore Odell, *Socialfunds.com*, 3 April 2007**.*)*

In March 2008, *the US* **Social Investment Forum** *released its* **2007 Report on Socially Responsible Investing Trends in the United States**. *It found that about 11 % of assets under professional management in the US are now involved in SRI – $2.71 trillion worth (from $639 billion in 1995).*

In Europe, according to the European Social Investment Forum (Eurosif), *the socially responsible investment market in 2007 was valued at €1000 billion. (Source:* **Ruth Sullivan, *FT.com*, 6 August 2007**.*) A year later, another report by Eurosif claimed that the "core SRI" market had grown to "€512 billion in 2007, from €105 billion the previous year, while the "broad SRI" had grown to €2.2 trillion, up from €928. Together, this would constitute 17.5% of the European asset management industry. (Source:* ***Environmental Finance*, 2 October 2008**.*)*

Worldwide, the best-known sustainability-related investment vehicles are the Dow Jones Sustainability Indexes, *launched in 1999. Sixty licensees in 14 countries manage a total of over US$5 billion based on the DJSIs. The World Index comprises the 10% of companies that score highest on an array of 314 components in each of 58 industry groups. Their performance has tracked two to four percentage points above the MSCI World Index. (Source:* **SAM Group announces results of Dow Jones Sustainability Indexes review - 6 September 2006** *and* **Tables, May 2007**.*) Its latest Annual Review reported that 33 companies had been added and 25 were deleted. Since inception (August 1999, to August 2008), the World Index shows a Total Return of -7.70%, compared to -9.57% for the MSCI World Index. (Source:* **SAM, Dow Jones Sustainability Indexes Annual Review, 4 September 2008** *and SAM and WBCSD media releases.)*

Even longer established among SRI-type funds is Domini Social Investments*; its Social Equity Fund was launched in 1991. Recent additions to the range of "green" products include* Allianz RCM Global EcoTrends℠ *(launched 31 January 2007), the* Merrill Lynch Energy Efficiency Index *(August 2007), and the* Standard & Poor ESG India Index *(February 2008). The new* FTSE ET50 Index *(also since February 2008) comprises the 50 largest pure play environmental technology companies.*

Environmental Finance, *in its August 2008* Carbon Funds Directory, *reported that the global carbon fund market, which invests in emissions offset credits from clean energy projects, had risen to $13 billion; the overall carbon emissions market had grown to $64 billion. (Source:* **Michael Szabo, *Reuters*, 21 August 2008**.*)*

In August 2008, Dow Jones and the Chicago Climate Exchange launched two new emissions indexes, the European Carbon Index *and the* Certified Emissions Reductions Index. *The former tracks permits traded under the EU's Emissions Trading Scheme while the latter tracks credits traded under the Kyoto Protocol's Clean Development Mechanism.*

In 2001, the Conference Board of Canada published a now outdated assessment of how Canadian "SRI" funds are faring:

The Conference Board of Canada, Sustainable Development, Value Creation and the Capital Markets, Canadian Centre for Business in the Community, 2001, 21 pp.

Identifies four styles of Socially Responsible Investing: Screening, Shareholder activism, Community investing, and Labour-sponsored investment funds. The study concludes from a review of 18 research studies and news reports that the "practice of Sustainable Development is a value driver/revenue generator that relates positively to share performance."

An emerging niche is microfinance, as reported by Deutsche Bank Research:

Raimar Dieckmann, Microfinance: An emerging investment opportunity – Uniting social investment and financial returns, Deutsche Bank Research, Frankfurt am Main, 19 December 2007, 26 pp.

The paper explains the economics of microfinance and the current structure of the industry. It estimates that 90% of the potential market of 1 billion micro-borrowers remains unserved, a funding gap of about US$250 billion. It explains three types of investment approaches, differentiated according to their respective degree of commercialization.

6.4 Capital market practices

(Please see also the annotations for Banking in section 3.2 and the Insurance sector in section 3.10 above.)

6.4.1 Principles for Responsible Investment (PRI)

In 2004, UNEP Finance Initiative's Asset Management Working Group convened a meeting of Europe's largest pension funds to discuss the development of a framework for 'responsible investment.' Later that year UNEP was invited by the UN Secretary General to make this effort part of the Global Compact. In April 2006, the Principles for Responsible Investment were launched at the New York and Paris stock exchanges with an initial list of 65 signatories. By mid-2007 the number of signatories had reached 200, with over US$9 trillion assets under management. By May 2008 there were 362 members with over US$14 trillion in assets.

Signatories are either institutional asset owners such as pension funds, foundations and insurance companies (133), investment management companies (152) or professional service partners (77). European signatories continue to dominate (148) but there are also 70 North American members. The Canadian members to date are:

- the Canada Pension Plan Investment Board,
- the Caisse de dépôt et placement du Québec,
- the Comité syndical national de retraite Bâtirente,
- the B.C. Investment Management Corporation,
- Growthworks Capital,
- Inhance Investment Management,
- Meritas Financial, and
- The Ethical Funds Company.

The chief executive of Bâtirente, Daniel Simard, is a member of the PRI Board.

The overall goal of the PRI is to mainstream the integration of ESG issues into investment decision making, in the expectation that this will improve long term returns. The intended reach is thus well beyond the 'socially responsible investment' community.

There are six principles. Signatories pledge to:

1. incorporate ESG issues into investment analysis and decision-making processes;
2. be active owners and incorporate ESG issues into their ownership policies and practices;
3. seek appropriate disclosure on ESG issues by the entities in which they invest;
4. promote acceptance and implementation of the Principles within the investment industry;
5. work together to enhance their effectiveness in implementing the Principles; and
6. each report on their activities and progress towards implementing the Principles.

Each of the Principles is accompanied by a list of possible actions, 35 in total. Two progress reports have been issued to date: **UNEP Finance Initiative, PRI: Report on Progress 2007, 4 July 2007, 40 pp.**, *and* **PRI: Report on Progress 2008, 17 June 2008, 52 pp.** *The 2008 report displays the results of a second-year survey and found (self-assessed) progress in meeting expectations under each of the principles. (Two out of three signatories as of the end of 2007, or 156, responded to the survey, but the comparative results are based on an undisclosed smaller number who participated both years.)*

In October 2008, PRI announced that it had joined forces with the Enhanced Analytics Initiative.([87])

6.4.2 Pension fund policies; financial research

The change in orientation – from earlier 'socially responsible investment' that may have lower performance to the more recent one of seeking out investments with a high ESG score because they promise better returns – is illustrated in the policy enunciated by the Investment Board *of the* Canada Pension Plan (CPPIB). *As part of reforms of 1996-97, the CPPIB was entrusted with management of the CPP reserve fund, $110 billion as of December 2006. In February 2007 the Board issued a Policy on Responsible Investing. It superseded an earlier Social Investing Policy of 1994. A revised version was released in February 2008.*

CPP Investment Board, Policy on Responsible Investing, 7 February 2007, 7 pp. Revised, 5 February 2008, 6 pp. Also Backgrounder, 3 pp. (Available at www.cppib.ca.)

The policy formulates a number of guiding principles, the first one of which is that it is the "overriding duty of the CPP Investment Board ... to maximize investment returns without undue risk of loss." Other principles include:

- Responsible corporate behaviour with respect to environmental, social and governance (ESG) factors can generally have a positive influence on longterm financial performance, recognizing that the importance of ESG factors varies across industries, geography and time;
- Disclosure is the key that allows investors to better understand, evaluate and assess potential risk and return, including the potential impact of ESG factors on a company's performance;
- Investment analysis should incorporate ESG factors to the extent that they affect long-term risk and return;

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[87] *Please refer to Sidebar 4. As noted there, PRI Board member Bâtirente is also a member of the Enhanced Analytics Initiative (EAI).*

The Board is against constraints (screening) but encourages responsible behaviour through engagement, primarily focused on Canadian equities, where its ownership share is 2 to 3% on average. Five forms of engagement are spelled out, further elaborated upon as a 5-fold process. Research into the "long-term financial materiality of ESG factors" is also actively supported.([88])

Here is an international comparison of mandatory disclosure requirements for pension funds:

Laura O'Neill, Social, Environmental and Ethical Pension Fund Disclosure: International Precedents and Options for Canada, prepared for Environment Canada, March 2007, 23 pp.

The author is Director of Law and Policy of the Shareholder Association for Research and Education. The report reviews disclosure requirements in the UK, France, Sweden, Germany, Australia and Belgium. It then discusses the modalities of implementing disclosure requirements in federally regulated public pension funds. It recommends UK-style regulatory amendments without prescribing the form of disclosure. The report notes that disclosure requirements by pension funds have prompted disclosures by money managers retained by the funds.

As succinctly observed in the 2007 UNEP Finance Initiative report annotated earlier (section 6.2.4), **engagement** *is indeed the current watchword for socially and environmentally responsible investment management. In June 2007,* Socialfunds.com *reported that "with weeks still left in the US proxy season, the 2007 season is on track to set new record highs for the number of social and environmental resolutions in front of shareholders." Dominant themes were the environment, political giving, executive compensation and sustainability reporting. The latter was the subject of 40 resolutions, double the number last year. (Source:* **Anne Moore Odell, *Socialfunds.com*, 13 June 2007.**) *A year later,* ***Environmental Finance*** **(21 August 2008)** *reports CERES' finding that 57 climate change related resolutions were filed, up from 43 the previous year. Twenty-five were withdrawn after companies committed to address global warming issues. The 26 resolutions that proceeded to votes received 23.5% support on average, up from the previous year.*

UNEP's Finance Initiative collected 15 case studies of public pension funds, selected from a sample of 25:

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[88] A clear policy does not make the institutional investor immune from criticism. The CPPIB and the BC Investment Management Corporation have stakes in an electricity project in Patagonia which is being strongly criticized by environmentalists. See **Martin Mittelstaedt and Colin Barraclough, *Globe and Mail*, 5 May, 2008.**

UNEP Finance Initiative, Responsible Investment in Focus: How leading public pension funds are meeting the challenge, 2007, 83 pp.

Funds described are from 12 countries, including Canada's Caisse de dépôt et placement du Québec. For each, there is a description of the fund, a brief rationale of its Responsible Investment policy and two pages or more on its RI strategy (what it is actually doing).

To put this in perspective, here is an earlier study for Environment Canada and NAFTA's Commission for Environmental Cooperation which makes one skeptical of the impact of ESG considerations, at least up to 2005:

Sue McGeachie, Matthew Kiernan and Eric Kirzner, Finance and the Environment in North America: The state of play on the integration of environmental issues into financial research, Commission for Environmental Cooperation, 2005, Executive Summary, 19 pp.

The first two authors are with Innovest, the third is with the University of Toronto. The purpose of the study was to determine "the current state of integration of environmental research into company and sector valuations by the mainstream financial community in Canada, the United States, and Mexico." The authors managed to complete only 41 interviews among financial analysts, portfolio managers, and investment consultants, despite apparently strenuous efforts to do more. They find this in itself a significant finding of the study. (*Comment*: The executive summary does not say how they went about contacting their potential targets or what their success rate was.)

Some respondents said that strong environmental performance would be reflected in good management and healthy cash flow so that explicit environmental indicators are not needed. Most seemed utterly unconvinced of the value of extra-financial factors for share appreciation.

Canada's financial community appears to be lagging behind the US in integrating environmental issues into stock considerations and Mexican investment professionals are further behind still. In the UK and continental Europe these issues are taken much more seriously. The study concludes with a long list of recommendations for governments, including the suggestion that disclosure be legislated. There are also some recommendations for corporate management and for investors.

Implicit in the report, but never stated, let alone discussed, is the notion that more systematic consideration of environmental factors would provide an opportunity to enhance financial performance.

Also aiming to answer the question how responsible investing could evolve from a niche to mainstream practices is a report based on three roundtables organized by the World Economic Forum's Global Institute for Partnership and Governance:

World Economic Forum and AccountAbility , Mainstreaming Responsible Investment, January 2005, 62 pp. (See also **William Baue, *Socialfunds.com*, 13 January 2005.**)

The discussions took place in 2003-2004 and brought together corporate and investment industry executives as well as other experts

> to improve understanding of concrete impediments to and opportunities for broader integration of social and environmental aspects of corporate performance in mainstream investment policies and practices.

Impediments from an asset management point of view are identified, as well as from the perspective of investment analysis and pension funds. The report then describes ways of modifying incentives, building competence and refining the definition of materiality, among other things. It calls for extending and deepening the dialogue between companies, pension trustees, advisors, fund managers and policymakers.

A more recent report deals specifically with the impact of climate change on investment decisions. It is based on responses from fund managers of 19 mainstream UK firms with a total of over £3 trillion in assets under management. It leads one to question the weight accorded so far to such "non-financial" considerations:

The Headland Consultancy, Has the debate on climate change affected institutional investment behaviour?, June 2007, 10 pp. See also **Francesca Rheannon, *Socialfunds.com*, 25 August 2007** and **John Russell, *Ethical Corporation*, 16 August 2007.**

The report finds that "awareness of the debate [about the impact of climate change], and the potential economic consequences associated with the effects of climate change, has yet to drive revisions to fundamental investment strategies." Only in some sectors (insurance, utilities, mining, transport) is a direct impact recognized. Mandates do not yet include guidance on considering the potential effect of climate change. 'Long term' is three years; quarterly reporting to clients is the over-riding consideration. As companies disclose more about the impact of climate change and governments impose regulations, fund managers will begin to pay attention.

Anne Moore Odell, *for **SocialFunds.com** (**1 July 2008**), reported on similar findings by RImetrics, based on a survey of fund managers covering "more than half of the world's leading 20 fund managers" with over $12 trillion of assets under management. (The study could not be found on RImetrics' web site.) As quoted by Odell, the authors of the study conclude:*

> The industry as a whole is a long way from best practice: although asset managers increasingly accept that ESG factors can influence investment returns and risks, most have yet to develop the corresponding competencies systematically across their organization.

In October 2005 members of the **Sustainable Investment Research Analyst Network (SIRAN),** *representing 23 investment firms from around the world, issued a* **Social Research Analyst Statement on Corporate Sustainability Reporting (October 2005 Update, 5 pp.**; *ref.* **www.siran.org**), *offering their perspective on experience with using information disclosed in sustainability reports. The Statement strongly recommends using the GRI Guidelines as a basis for corporate reporting.*

6.4.3 Venture capitalists; private banking

Cleantech Group LLC has reported that venture investment in 2007 in alternative energy in North America and Europe amounted to $5.18 billion, compared to $3.6 billion the previous year, an increase of 44%. In 2006 the rise was also 44%. The number of deals increased 15%, to 268, and the average deal size rose 20% to $13.7 million. (Source: **Nichola Groom, *Reuters*, 17 January 2008**.*)*

UNEP reported a similar clean technology VC figure for 2006 ($2.9 billion), describing it as an 80% increase over 2005 and the trend as the "world's newest gold rush." Most of this funding went toward wind, solar and other low-carbon energy technologies. Assisting in technology transfers to developing countries (including via the UN's Clean Development Mechanism under the Kyoto Agreement) also offers potential. New Ventures India was formed in 2005 with help from the US Agency for International Development and has 40 venture capitalists in its Clean Investment Network who are scouring India for promising entrepreneurial opportunities. (Source: ***Globe-Net*, 16 December 2007**.*)*

London-based New Energy Finance (NEF), in a 2007 study, found that venture capitalists were able to invest only 73% of the funds that had been raised for clean-tech investment – $2 billion could not be spent. One US and one European clean tech venture fund closed their doors early in 2007. The 2008 US election campaign has seen promises of funding for clean tech investment in the order of $10 to $50 billion per year. Such competition from government-funded investment pools may make life difficult for the VC industry. (Source: **idem**.*)*

The NEF study added VC and Private Equity funds for clean tech together and counted $18.1 billion in 2006, a 67% increase over 2005. Of this, 86% went to wind, biofuels and solar technology. It predicted a 17% annual compound rate of growth through 2013. Regionally, US investments more than doubled in 2006, Asia increased 45% while Europe actually shrunk 2%.

Nonetheless, the UK's Carbon Trust([89]) asserted that clean energy investment has moved from the backwaters to the mainstream. It found that, of the €1.96 billion in European VC investment between 2003 and 2006, 10% was earmarked for clean energy. (Source: ***Environmental Finance*****, 6 September 2007** *and* **Mike Scott, *FT.com*, 11 June 2007.**)

In November 2006, 44 Swiss-based private bankers met in Geneva to discuss ESG-inclusive investment for high net worth individuals:

UNEP Finance Initiative (Asset Management Working Group), Unlocking Value: The scope for environmental, social and governance issues in private banking, January 2007, 24 pp.

The report notes the growing acceptance among institutional investors that ESG issues should be factored into their decision making, "driven first and foremost by the ever-growing body of evidence (from industry and academic research) that ESG issues have a material impact on the financial performance of investments" so that it is their fiduciary duty to give these issues appropriate consideration.

A Deutsche Bank study in 2000 estimated that high net worth (HNW) individuals hold about 4% of their assets in ESG-inclusive investments. (HNW wealth totaled US$33.3 trillion in 2004 and is expected to reach $45 trillion in 2010.) Yet, 32% say they find the concept attractive. Therein lies an opportunity, the report notes. It describes three types of private clients who may be interested in ESG-inclusive investments, the first of which is the investor solely interested in enhancing financial returns. A list of potential barriers to uptake follows, as well as recommendations on how to overcome such barriers and introduce clients to ESG-inclusive investment. There are also recommendations for the executives of private banking institutions.

What one may conclude from this gap between empirical evidence (section 6.2) and industry practice (this section) is the starting point for the last subject broached in this Section.

6.4.4 Against short-termism

Recall that, on one hand, we found strong evidence of a positive correlation between more sustainable behaviour and stock market returns, especially as one looks back over some historical period – in one version, it was demonstrated that there IS an eco-efficiency premium. Yet we also found that including environmental and social factors in one's search for optimal investment has yet to become mainstream in the financial industry. The market would not appear to be doing its job: It has trouble cluing in to the difference that good or bad ESG performance can make for Total Returns.

When sustainability ratings are not in sync with stock market returns, is it due to insufficient or not widely enough shared information, or is the problem a deeper one: that sustainability may create

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[89] *Refer to section 6.2.1, note.*

value in the long term but that markets react only to short-term phenomena such as quarterly earnings?

That the obsession with quarterly earnings exists is well known. It may also blind investment advisers to the staying power and longer term earnings potential of firms who manage environmental, social, and ethical problems well.

The ailment is called short-termism. There is interesting literature about these questions, and there are attempts to find a cure. The premise of these attempts is the belief that Peter Drucker was correct when he said:

> It is an axiom proven countless times that a series of short-term tactics, no matter how brilliant, will never add up to a successful long-term strategy.[90]

Without any explicit reference to sustainability as defined here, and firmly grounded in the belief that discounted cash flow (DCF) analysis is the only true way to estimate value,[91] Alfred Rappaport, Professor Emeritus at the Graduate School of Management at Northwestern University, analyzed the problem and offered solutions:

Alfred Rappaport, "The Economics of Short-Term Performance Obsession," *Financial Analysis Journal*, vol. 61 no. 3 (2005), pp. 65-79.

Rappaport notes that "investment and corporate managers have a mutually reinforcing obsession with short-term performance..." Earnings per share dominates as a metric, despite the fact that companies have considerable latitude in managing earnings because of their accruals component. Worse, the overwhelming majority of a company's value derives from cash flow attributable to future events, not existing contracts. Allocative efficiency – the key role of stock markets, which are supposed to allocate resources through pricing – is not helped by the proliferation of non-DCF models of investing.

A Corporate Performance Statement is proposed which would replace the traditional income statement. It would distinguish revenues and cash flow from operations (minus investments) from medium- and high uncertainty accruals; a range of estimates would be provided for the latter. Value-irrelevant charges would not be included; depreciation "is clearly a case of accounting ritual trumping relevance." The paper further sets out how incentives for corporate executives and investment managers could be restructured to favour alignment with a long-term value-creating objective. The paper concludes:

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90 The Pension Revolution, *quoted in* **Marathon Club (2007)** – see further this section.

91 *Section 4.2 annotated a paper by* **Reed (2001)** *that seriously questions this belief. See also Appendix C.*

> There is no greater impediment to good corporate governance and long-term value creation than earnings obsession. There is no greater enemy of stock market allocative efficiency than earnings obsession. Alleviating earnings obsession will not eliminate the occasional madness of crowds, but sensible investors looking for excess returns will bet against the madness and hasten the return to sanity. The potential payoff from reducing short-term performance obsession in the investment and corporate communities is substantial.

The global-level Conference Board devoted one of its Corporate/Investor Summits to the same topic. The Summit was held in London, UK, on July 6, 2005:

Matteo Tonello, Revisiting Stock Market Short-Termism, The Conference Board Global Governance Research Center, Corporate/Investor Summit Series, 2006, 48 pp.

Exactly who attended the Summit is not evident but the report is said to represent "a unique consensus achieved" there. The rise of short-termism is seen as linked to a number of developments since the 1970s including: the rise of pension funds and institutional investors generally, US taxation changes that sharply reduced the difference between taxation of capital gains and earnings, the move to floating commission rates for stock brokers and the rise of the hedge fund industry, which is speculative by definition. Broadband internet and on-line brokerage services have facilitated short-horizon investment decisions. Economic implications of the rise of short-termism are illustrated in a survey which found that "most managers ... would rather forego an investment promising a positive return on capital than miss the quarterly earnings expectations of their analysts and financiers." ([92]) The report concludes:

> ... stock market short-termism negatively affects the economic system, as it does not provide proper incentives for business to pursue strategic opportunities that would translate into sustainable growth.

And again:

> Undoubtedly, the health of an economic system depends on its ability to perform well year after year – not only during the next quarter. Where accompanied by a set of rules that assures equal treatment to all market participants, steady and sustainable growth becomes the key to prosperity for a society. Market short-termism, on the contrary, undermines confidence in the soundness of the underlying economy, favors opacity on strategic goals, and encourages opportunistic behaviors by a few to the detriment of the many.

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[92] This paraphrases findings by **John R. Graham, Campbell R. Harvey and Shiva Rojgopal, "The Economic Implications of Corporate Financial Reporting," NBER Working Paper No. 10550, June 2004**. The paper reports on a survey of 312 financial executives of publicly traded companies. Asked what they would do if, near the end of the quarter, the company might come below the desired earnings target, 55% said they would "delay starting a new project even if this entails a small sacrifice in value." Asked "how large a sacrifice in value [their] firm would make to avoid a bumpy earnings path," 52% said they would make a small, 24% a moderate and 2% a large sacrifice.

The report goes on to discuss a number of factors militating for change, including major empirical research that supports the link between sustainability ("environmental, social and corporate governance") and improved stock prices and shareholder value.

Summit delegates saw short-termism as a chain – each link in the chain needs to change simultaneously for short-termism to be beaten down. Corporations should develop better metrics and adopt an enterprise risk management framework, among other things. Suggestions are also made for the other links in the chain – investors (pension fund trustees, investment managers, hedge funds) and analysts.

Members of the UK Marathon Club *([93]) believe that a long term perspective creates the highest value. They published a consultation paper and initiated a conversation with a wide range of financial industry players:*

Marathon Club, Long-Term, Long-Only - A Consultation Paper, 16 March 2006, 31 pp.

In an introductory note, the then Chairman of the Club states:

> It is the strongly held belief of the Marathon Club that th[e] short-term focus by all parties leads to investment choices being made which fail to maximise the longer-term financial performance of client portfolios, investee companies and the wider economy. Investors are forming their decisions on outcomes that cannot be reliably forecast. Managers are allocating capital to value-destroying projects which, nevertheless, deliver on short-term targets such as analysts' earnings per share estimates. Businesses are being valued on the basis of accounting metrics that do not capture the effect of extra-financial factors on long-term operating performance. In receipt of the wrong signals from investors, investment managers are in danger of inefficiently allocating capital.

Further on, the paper recognizes that proponents of efficient markets challenge the underlying premise of long-term long-only investing, which is that

> long-term pricing inefficiencies exist in equity markets which can be exploited by skilled managers who are not benchmark driven. ... Fundamental inefficiency may exist because extra-financial factors are missed out in many decisions.

The paper generated many responses, from the UK and around the world. A summary is available on the Marathon Club web site.

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[93] *The Marathon Club (www.marathonclub.co.uk/) comprises "institutional fund trustees, senior executives or senior specialists" who are in a "leadership role in public and private institutional funds and endowments." It has approximately 18 members. Few names are mentioned and no affiliations are identified but the Secretary to the Club is Hewitt Associates.*

A year later, the Club published a Guidance Note on what a long-term, long-only contract between a trustee/investor and an account manager could look like:

Marathon Club, Guidance Note for Long-Term Investing, Spring 2007, 36 pp.

In a foreword, the 2007 Chairman asserts that "a successful approach to long term investing rests primarily on the mindset of trustees and their beliefs, and on how the investment process is structured." The guide is intended primarily for those directly involved in making decisions on how the assets of pension funds, charities and endowments are invested ("trustees").

The paper then provides advice on trustee investment beliefs, framing of return and risk objectives, manager selection and remuneration, monitoring, and the role of advisors. An Appendix lists the attributes of a long-term investment manager.

Also noteworthy is an earlier brief paper by members of the Thinking Ahead Group, *part of the Investment Practice at Watson Wyatt:([94])*

Watson Wyatt Worldwide, "Short-termism: A real or imaginary problem?" in Remapping our investment world, April 2004, Australia edition, 34 pp., pp. 4-5.

The paper discusses asset management and governance issues in the context of pension funds. It reviews philosophical, mathematical and behavioural arguments to conclude that short-termism is a problem. A chart showing the explosive growth in equity turnover beginning in the 1990s supports the comment that this "has enriched the broking community at the expense of superannuation funds and their members."([95])

To conclude, a brief annotation of two largely exhortatory reports:

onValues Investment Strategies and Research Ltd., Investing for Long-Term Value - Integrating environmental, social and governance value drivers in asset management and financial research, - A state-of-the-art assessment, Conference Report, Zurich, 25 August 2005, published 26 October 2005, 25 pp.

A large 1-day conference was held in Zurich. The conference was sponsored by the Global Compact, the International Finance Corporation and the Swiss Federal Department of Foreign Affairs. In an Annex, the

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[94] "Watson Wyatt *is the trusted business partner to the world's leading organizations on people and financial issues." (Ref.* www.watsonwyatt.com/*) It has offices around the world, including in five Canadian cities. This report is from their Australia office.*

[95] *See also* **Fabrice Taylor (*Globe and Mail*, 15 October 2008)** *who includes a chart from the US Bureau of Economic Analysis. It shows that US financial profits as percent of GDP remained below 1% between 1947 and the late 1980s and then shot up to an astonishing 2.5% by (latest data) September 2007.*

Conference Report could list almost 30 developments in the year since Who Cares Wins (2001) that promote the long term investment perspective and the mainstreaming of ESG considerations.

UN Global Compact, Who Cares Wins – Connecting Financial Markets to a Changing World, 2004, 41 pp.

A further subtitle says the report offers "Recommendations by the financial industry to better integrate environmental, social and governance issues in analysis, asset management and securities brokerage." The report was endorsed by 21 major actors in the financial industry (none Canadian). It aims to increase awareness.

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SECTION 7 The Role of Government

7.1 Introduction and overview; government web sites

The preceding sections made several dozen references to the role played by governments here and abroad in helping businesses to become more sustainable. These include references to:

- *framework policies (e.g., sections 1.4 | 2.4.1 | 2.4.4 | Sidebar 2 | 3.5 | 5.3 | 6.4.2)*
- *partnerships (sections 1.4 | 2.4.4.2 & 5.5 | several industries in Section 3 | 6.2.1)*
- *information (sections 2.4.1 | 2.4.3.2 | 3.11 | and many others)*
- *research and publication support* (passim)
- *actions by state enterprises, regulators and other agencies* (passim), *and*
- *programs and other forms of assistance (sections 1.4 | 2.3.1 |2.4.1 |2.4.2 | 6.4.3).*

This Section will attempt a more systematic treatment of this role. First we review literature on the overarching role of governments related to sustainable development. This is followed by an account of the federal government's creation, in 1995, of the Office of the Commissioner of Environment and Sustainable Development that grew out of the perception of that overarching

role; the new Federal Sustainable Development Act (2008) is briefly annotated. The last subsection concludes with annotations of broad-scope work by the OECD, the EU and Environment Canada – the latter a specific strategy in 2003-2007 to engage SMEs.

We next take up a number of specific topics: regulation; fiscal policy; product and industrial policy, including sustainable consumption; indicators development; public information and education; governance; and energy policy.

We conclude with some annotations on specific suggestions made to governments on how they can assist businesses, and SMEs in particular, in moving towards sustainability.

Aggregating from the previous sections and from what follows below, the role of governments in helping businesses to become more sustainable may be categorized as follows:

1- establish framework conditions through laws, regulations and creation of institutions;
2- adopt policies, including fiscal policies and adoption of international treaties;
3- provide incentives or subsidies;
4- provide information (including technical assistance) and support information networks and partnerships;
5- support research and research networks; and
6- support pre-commercial pilot projects.

A perusal of Canadian federal government and other web sites will turn up evidence for engagement in all of these roles, though manifestations of role #4 predominate. See, among others:

Industry Canada web sites:
- Sustainable Development
- Eco-efficiency
- Corporate Social Responsibility
- SMEs - Improve Your Environmental Performance!
- SME Direct - Lean, Clean and Green
- High Performance (Lean) Manufacturing
- Competition Bureau - "Environmental Claims: A Guide for Industry and Advertisers" (June 25, 2008)

Environment Canada web sites:
- Economics and Sustainability
- Corporate Environmental Innovation
- Incentives and Rebates
- Information for Business - Energy Conservation
- Extended Producer Responsibility & Stewardship
- Pollution and Waste

- National Office of Pollution Prevention
- National Pollutant Release Inventory (NPRI)
- Funding Technologies for the Environment
- Environmental Technology Advancement (CETA)
  (in Ontario: OCETA; in BC, Alberta, Saskatechewan and Manitoba: CETAC-West)
- Environmental Choice Program (EcoLogo™) - www.terrachoice.com
- Enviroclub - www.enviroclub.ca

Natural Resources Canada web sites:
- Sustainable Development
- Office of Energy Efficiency including:
  - ecoENERGY Retrofit
  - Canadian Industry Program for Energy Conservation
  - Directory of Energy Efficiency and Alternative Energy Programs in Canada

And:
- Canada Mortgage and Housing Corporation - under Sustainability
- Canadian Centre for Pollution Prevention
- National Research Council - IRA Program
- National Round Table on the Environment and the Economy
- Office of the Auditor General of Canada
- Sustainable Development Technology Canada (SDTC)
- Policy Research Initiative
- Public Works and Government Services - Green procurement policies

Interdepartmental:

- ecoACTION
- Sector Sustainability Tables
- Sustaining the Environment and Resources for Canadians

Provincial or municipal web sites and references:

- BC Climate Exchange
- SmartSteps - Greater Vancouver Regional District
- The Toronto Region Sustainability Program (TRSP)
- Enviro-Access [Quebec]
- Nova Scotia Eco-Efficiency Business Assistance Program
- Fraser Basin Council - on energy efficiency in buildings
- "Highlights of Provincial Greenhouse Gas Reduction Plans," version 1, August 8, 2007 (The Pembina Institute, 8 pp.)

International:

- Local Governments for Sustainability (ICLEI)
- EU mandatory emissions reductions (10 Jan 2007) - http://ec.europa.eu/environment/climate/future_action.htm
- US: EnergyStar for Small Business (Small Business Administration)

7.2 The role of government – broad strokes

7.2.1 The totality of the challenge and the special burden on governments

Ann Dale, now on the faculty of Royal Roads University in Victoria, B.C.; ([96]) offers a broad-ranging analysis of and reflection on the challenge before us and the role of governments:

Ann Dale, in collaboration with S.B. Hill, At the Edge: Sustainable Development in the 21st Century, UBC Press, Vancouver, 2001, 184 pp, plus References and Index.

Prof. Dale concludes early on that

> ...we are approaching, and in some realms may have already exceeded, the global carrying capacity of the planet. ... Our species has clearly moved from a self-perpetuating way of life that relied on the circularity of natural biogeochemical processes to a way of life that is ultimately self-terminating... Current practices are clearly not sustainable, and business as usual is not an option. Sustainable development is, therefore, a strategic imperative for all nations at every level of human activity. (p. 33)

She proposes a model that, through civil dialogues, will reconcile the ecological, social and economic imperatives the world faces. (See Sidebar 1 for her definition of SD based on these three imperatives.) She identifies the **ecological imperatives** as being: move human reproduction from an r- to a k-strategy ([97]); produce no waste; find the appropriate scale of human activity; maintain biodiversity; and reduce the human-induced impact on climate change. The **social imperatives** include education of women; elimination of poverty; and improving ecological literacy. The key **economic imperatives** are seen as being: use multiple measures of human well-being; get the prices right; eliminate perverse incentives; improve performance indicators; and move from 'pioneer' to steady-state economics.([98])

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[96] *Previously, for 23 years, she was a federal public servant.*

[97] In biology, species with an r-strategy produce many offspring. Species with a k-strategy produce few offspring. While in a broad context humans already follow a k-strategy, the implication is that the human species should move towards producing even fewer offspring, as is already the case in Western societies.

[98] The classic reference on steady-state economics is **Herman E. Daly, Steady-State Economics [1977], Second Edition with New Essays, Island Press, 1991, 302 pp.** For a more recent discussion, see **Peter A. Victor, Managing Without Growth – Slower by Design, Not Disaster, Advances in Ecological Economics, Edward Elgar, 2008, 260 pp.**

Government institutions (and academe) are seen as mostly displaying gridlock:

> When bureaucracies are faced with complex ecological systems characterized by complex interactions, masses of information that often seems contradictory, millions of species, and unknown phenomena and risks, they tend first to focus on those phenomena and cause-and-effect relations that conform to their decision-making structures and their dominant paradigms. (p. 108)

The example of the East Coast fisheries collapse is seen as an outcome of ineffective oscillation between exploiting and conserving. Some attempts to break down stove-pipe thinking, such as the NRTEE as it was originally intended, have not succeeded in doing so. In a final chapter she concludes:

> The implementation of sustainable development is ... one of the most important human imperatives of the twenty-first century, requiring strong leadership by local, regional, and national governments. The adoption of a reconciliation framework across governments is critical to the ability to provide consistent and effective leadership to other sectors of civil society, in order to diffuse sustainable development concepts and practices, before we reach irreversible critical thresholds. Guiding frameworks based on the reconciliation of the three imperatives – ecological, social and economic – are critical ... [G]overnments are the most logical convenors of the stakeholders who need to be at the table. ... the complexity of the issues demands deep structural changes in the way we make decisions. The only way that such changes will occur, however, is through exposing the dominant paradigms, values, and restraints that work together to support the existing powerful movement for resistance on so many levels. (p. 161)

From Australia comes a similar call for a "new paradigm:"

Karlson 'Charlie' Hargroves and Michael H. Smith (editors), <u>The Natural Advantage of Nations: Business Opportunities and Governance in the 21st Century</u>, Earthscan, London, UK, 2005, 460 pp. plus Notes, References and Index.

Strongly inspired by Michael Porter's analysis and prescriptions and by the Natural Capitalism literature (both Amory and Hunter Lovins wrote Forewords), the editors position themselves as belonging to the new generation: In the next three decades they must do better than the generation responsible for the previous three. The work is replete with examples, from Australia and around the world, of the proposition that **achieving sustainability is a case of win-win, not a trade-off between it and prosperity**.

This work is part of The Natural Edge Project ([99]); there is an on-line companion to the book.

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[99] "**The Natural Edge Project (TNEP)** is an independent Sustainability Think-Tank based in Australia. TNEP operates as a partnership for education, research and policy development on innovation for sustainable development." Ref.: **<u>www.naturaledgeproject.net</u>**.

From the 2000 version of the Australian Policy Handbook ([100]) the authors borrow a taxonomy of government mechanisms under four headings which include the words:

- advocacy;
- using spending and taxation power;
- delivering services; and
- using legislative power.

Page-length text tables provide elaboration and examples for each, as well as for the "Key role of government community partnership building." (Pp. 181-187)

The Honourable Stéphane Dion, in his first Speech as then-Minister of the Environment in September 2004, sounded a similar win-win note, asserting that we must "base the growth of our economy on a sustainable environment." The alternative is that countries will be unable to "improve, even to maintain, the quality of life of their people." He noted we need better decision-making, better science, better information; a clear and effective structure of incentives, and a focus on education of citizens and decision-makers. (Found on the Environment Canada web site.)

7.2.2 Issues

The federal government's Policy Research Initiative (PRI), *itself an example of an attempt to break through stove-pipe thinking, in 2002 undertook three projects under a Sustainability heading. One result was:*

PRI, in collaboration with IISD, Advancing Sustainable Development in Canada - Policy issues and research needs, November 2003, 78 pp.

The researchers were asked to exclude considerations related to climate change because of another process ongoing at the time. Following a disciplined and transparent methodology (described in an Appendix), the team identified seven issues and reviewed them against a number of **criteria**: general level of impact; urgency; likelihood of increased conflict; scope of social significance; international commitments and obligations; and change potential. The **issues** are: urban redesign; freshwater management; eco-region sustainability; impact of globalization; signals and incentives; unsustainable lifestyles; and, internationally, poverty.

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[100] The current version is **Catherine Althaus, Peter Bridgeman and Glyn Davis, The Australian Policy Handbook, Fourth Edition, 2007, Allen & Unwin, 268 pp.**

Case examples are cited and research needs are identified. ([101])

7.2.3 The *Auditor General Act* and the *Federal Sustainable Development Act (2008)*

Coming after the 1987 Brundtland Commission report and the 1992 Rio conference, and inspired in part by a 1989 report by environmental NGOs entitled Greenprint for Canada, *Parliament in 1995 amended the Auditor General Act by creating the position of Commissioner of the Environment and Sustainable Development.([102]) Ever since, departments have submitted SD strategies. However, a decade later, the then-Commissioner reported: "In summary, we can find little, if any, evidence that sustainable development strategies are serving the purpose for which they were introduced."* (Report of the Commissioner to the House of Commons, October 2007, p. 9.) *The Report went on to express the need for an overall federal strategy and the need for Parliamentary Committees to exercise better oversight over government actions.*

The Commissioner's conclusions were endorsed by a Green Ribbon Panel that reported shortly thereafter:

Fulfilling the Potential - A Review of the Environment and Sustainable Development Practice of the Office of the Auditor General of Canada, Report of the Independent Green Ribbon Panel to the Auditor General of Canada, December 2007, 61 pp.

The Report did note that, though the three pillars of SD are recognized in the *Act* and "promoting equity" is explicitly mentioned, the Practice devotes little attention to the social aspects of SD.

A new Federal Sustainable Development Act, *which received Royal Assent in June 2008, aims to remedy the lack of an overarching federal strategy. ([103]) The Act also seeks to strengthen the accountability mechanism and establishes a Sustainable Development Office within Environment*

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[101] The report is also summarized, along with several other articles and research briefs, in a special issue of ***Horizons*: "Sustainable Development: Where Next?" Vol. 6 No. 4 (2004), Policy Research Initiative.**

[102] *The Library of Parliament produced a brief background paper on the creation and role of the Commissioner, up to date to the Commissioner's 2004 report:* **Tim Williams, Sustainable Development in the Federal Government: I. The Commissioner of the Environment and Sustainable Development, 20 July 2005, Parliamentary Information and Research Service, PRB 05-12E, 7 pp.**

[103] *All-party support for this Bill is the legacy of former MP John Godfrey.*

Canada. As prescribed by the Act, 2009 will see a 120-day consultation period on a draft federal strategy, with, in addition to public consultation, specific roles for an Advisory Council, Standing Committees of Parliament and the Commissioner. In Spring 2010 the first Strategy is to be tabled in Parliament. The following year, the first 3-year supporting departmental strategies are to be tabled.

7.2.4 Instruments

We next briefly annotate a Policy Package in the OECD's Environmental Outlook published in 2008, and a 2007 Green Paper on market-based instruments from the Commission of the European Communities:

OECD Environmental Outlook to 2030, 2008, Summary in English, 14 pp.

The scope of this Outlook is expanded from its 2001 edition by including developments in Brazil, Russia, India, Indonesia, China and South Africa (BRIICS). The policy package covers Energy (pricing to reflect carbon content; support new technologies), Transport (have pricing fully reflect the cost of environmental damage and health impacts), Agriculture (remove harmful subsidies, tax farm chemicals; and price water to reflect irrigation costs), and a long list of measures for the Capture Fisheries. The report calculates that the package will reduce world GDP by 1% in 2030 (a reduction of 0.03 percentage points in annual GDP growth).

Commission of the European Communities, Green Paper on market-based instruments for environment and related policy purposes, Brussels, 28 March 2007, (SEC(2007) 388), 16 pp.

There is also a companion staff document:

Commission of the European Communities, Commission Staff Working Document accompanying the Green Paper on market-based instruments for environment and related policy purposes, Brussels, [n.d.], SEC(2007)388, COM(2007)140, 33 pp.

The Green Paper covers taxes, charges, tradable permits, environmental tax reform and reform of environmentally harmful subsidies. Further topics deal with energy taxation, transport, pollution (water, waste and air), and biodiversity.

The staff document goes into considerable detail about various options and the experience of Member States with market-based instruments. Topics covered include distributional aspects (for households and relative competitiveness), the double dividend argument in environmental tax reform (adding an employment effect to the environmental benefit), the

EU's 2003 Energy Taxation Directive, and habitat banking (raising the option of creating a real market for remediation). ([104])

7.2.5 Involving SMEs

In May 2005 Environment Canada proposed a strategy for engaging SMEs in SD:

Environment Canada, Small and medium-sized enterprises in Canada: An Environment Canada strategy for enhancing competitiveness through improved environmental performance, May 5, 2005, 12 pp.

The paper proposed a multi-pronged strategy involving education, program delivery, information, coordination and partnerships. It was designed to support the Department's Competitiveness and Environmental Sustainability Framework as it was then.

The following year a "Green Business Network" was proposed which as an initial focus would engage in "Lean and Clean" reviews of SMEs to identify opportunities for both productivity and environmental performance:

Brent Parker, Green Business Network – Engaging Small and Medium-sized Enterprises, Systems and Priorities Directorate, Environment Canada, 17 August 2006, 15 slides.
Green Business Network: Improving the Environmental Performance and Competitiveness of Small and medium-sized Enterprises through Lean and Clean Reviews – Proposal for Partnering, Program Concept, April 2007, 3 pp.

It seems the initiatives were eventually abandoned.

A background paper for Environment Canada's proposed strategy and two other reports discuss the role of government policy towards fostering sustainability of SMEs in Canada:

Stratos and Marianne Lines, Improving the environmental performance of small and medium-sized enterprises in Canada, Discussion paper submitted to Environment Canada, draft, November 25, 2004, 30 pp. and Appendices.

E2Management Corporation, An investigation of International Experience Promoting Sustainable Development in Small to Medium-Sized Enterprises (SMEs): What will help

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[104] The 4-month consultation period resulted in a **Commission Staff Document** analyzing the 172 replies to the Green Paper (**Brussels, 16 January 2009, SEC(2009)53, 23 pp.**)

Canadian SMEs be lean, keen and green?, An Investigation for Environment Canada, September 2004, 94 pp.

E2Management Corporation, Small and Medium-sized Enterprise (SMEs) And Sustainability – Do we have the right equipment?, Discussion paper prepared for Pollution Probe, November 2003, 26 pp.

The Stratos/Lines paper served as background for the development of the aforementioned federal strategy. The 2004 E2M paper for Environment Canada analyzes 50 programs around the world that aim to promote SD in SMEs and draws lessons for Canada. The 2003 paper analyzes how an Environmental Sustainability Policy Framework developed by Pollution Probe is and is not applicable to small businesses.

7.3 Specific topics

7.3.1 Regulation

Again out of Australia comes a rare work that squarely addresses the issue of environmental regulation of SMEs:

Neil Gunningham and Darren Sinclair, Leaders & Laggards – Next-Generation Environmental Regulation, Greenleaf Publishing, 2002, 204 pp. plus Bibliography and Index. ([105])

A chapter on regulating SMEs is followed by three case studies. (Regulating large enterprises is discussed next, followed by two case studies.) Topics include co-regulation, self-management and incentive structures, noting what works and does not work for SMEs. The authors note the paucity of literature and field work on regulation of SMEs.

Seven SME strategies for encouraging leaders and bringing laggards in line are outlined:

- reserve the threat of direct regulation for the minority that are demonstrably unwilling to take voluntary action;
- a tiered system of regulation may be valuable;
- whether tiered or not, a heavy reliance on complaints and reports from the public will remain necessary and inevitable;
- encourage enterprises to voluntarily report their offences; modify penalties if certain conditions are satisfied;
- on-the-spot fines have considerable potential;
- hold rotating industry-specific campaigns and blitzes; and
- practice restorative justice - attempt to restore compliance rather than revert to pure punishment.

The authors draw six lessons from their analysis of regulation affecting SMEs:

- Governments should focus on win-win solutions with demonstrable short-term financial payoffs. (A large proportion of SMEs are still unaware that such opportunities exist.)
- The more SMEs can be persuaded to do for themselves, the more committed they are likely to be to the outcomes.
- SMEs should be encouraged to adopt Environmental Management Systems, albeit in

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[105] Also reviewed by **Ian Campbell and Benoît Leduc** in the **PRI**'s ***Horizons*** **(2004), Policy Research Initiative**, pp. 48-49.

slimmed down form from what applies to large enterprises. Encourage large customers to apply pressure on the upstream supply chain to adopt EMSs. Encourage adoption through procurement policies.
- Provide incentives, preferably enabling firms to avoid or reduce costs.
- A credible threat of inspection and enforcement remains necessary.
- Find an effective policy mix.

The authors conclude that many less interventionist strategies are unlikely to succeed if they are not underpinned by direct regulation. Various surveys have also shown that the single most important motivator of improved environmental performance is regulation. They see, not the demise of regulation, but a reconfiguration.

The European Commission, in October 2007, launched an Environmental Compliance Assistance Programme (ECAP) *specifically geared to SMEs:*

Commission of the European Communities, Small, clean and competitive – A programme to help small and medium-sized enterprises comply with environmental legislation, Communication from the Commission to the Council, the European Parliament, the European Social and Economic Committee and the Committee of the Regions, 8 October 2007, SEC(2007)906, 907 & 908, COM(2007) 379, 12 pp. Complementary documents are available at http://ec.europa.eu/environment/sme/programme/programme_en.htm.

The programme aims to increase compliance by SMEs, increase their eco-efficiency, increase the cost-effectiveness of environmental policy, and increase eco-innovation by SMEs. The action plan comprises specific actions under five headings: minimizing administrative burden, providing more accessible EMSs, focused financial assistance, building local expertise, and improved communication. The 'home page' for this Programme is http://ec.europa.eu/environment/sme/index_en.htm .

The Programme proposals were welcomed by UEAPME, "The voice of SMEs in Europe.([106])

See also:

R. Fairman & C. Yapp, Making an impact on SME compliance behaviour: An evaluation of the effect of interventions upon compliance with health and safety legislation in SMEs, Kings College London for the Health and Safety Executive 2005, Research Report 366.

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[106] **"ECAP: enhancements are needed to help SMEs become greener," press release, 8 October 2007. UEAPME** *has 84 member organizations covering over 11 million enterprises. Ref.:* www.ueapme.com .

Here is a case study of what went, almost fatally, wrong with the introduction of Environmental Penalties in Ontario:

Stepan Wood and Lynn Johannson, "Six Principles for Integrating Non-Governmental Environmental Standards into Smart Regulation," *Osgoode Hall Law Journal* (2008), pp. 345-395.

The government of Ontario released its long-awaited Environmental Penalties regulations in June 2007. The authors explain that earlier drafts of the regulations had re-invented the wheel and had been developed in complete isolation from the standards community. As a result there were gaps and inconsistencies and, ultimately, there would have been higher costs for regulatees. In the end, the ministry-made EMS was scrapped. An opportunity to engage in constructive dialogue leading to greater adoption of EMSs by SMEs was lost.

Still, the authors note, ISO is to blame as well for being unable to connect with SMEs. For example, a draft "phased implementation" guide for ISO 14001 is more than twice the length of the ISO 14001 standard itself.

Please refer to section 7.3.3 below for a reference, in another context, to the federal Smart Regulation report and the 2007 Cabinet Directive on Streamlining Regulation.

The Ceres report on the insurance industry ([107]) sees the essential role of the regulator for that industry to be two-fold: maintain availability and affordability of insurance, and guard against insurer insolvency. It gently suggests that the regulator could request or require the various SD-friendly strategies the report outlined. Earlier, in 2006, the US National Association of Insurance Commissioners created a Task Force to study the implications of climate change.

7.3.2 Fiscal policy

Two recent Canadian reports offered advice on how fiscal policy can favour sustainable development:

Marlo Raynolds, Recommendations for an Economic Stimulus – Strategic investment for green jobs and a competitve and environmentally sustainable economy, Pembina Institute, 18 December 2008, 13 pp.

Green Budget Coalition, Meeting the Challenge – Recommendations for Budget 2009 – Climate, Water, Nature, n.d., 44 pp.

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[107] **Mills (2007:45-46)**, *ref. section 3.10.*

The Pembina Institute's recommendations deal with energy efficiency, renewable energy, public transit, the automotive sector and cap-and-trade policy. For each area, estimates are provided of the fiscal cost, the resulting new jobs and the contribution to GDP.

The Green Budget Coalition comprises 20 of Canada's leading environmental and conservation NGOs. Its three priority recommendations are for effective carbon pricing, safeguarding the Great Lakes-St. Lawrence Basin, and conserving oceans and lands. Six other recommendations are about energy efficiency measures, support of renewable energy, preserving minerals, extending Ecogift tax incentives, conserving migratory birds, and renewing and expanding indicators of environmental capital.

Fifteen years earlier, in 1993, the then Liberal government's Creating Opportunity *document had committed to a convergence of economic and environmental agendas. A* Task Force on Economic Instruments and Disincentives to Sound Environmental Practices *was created. Its report appeared at the end of 1994:*

Task Force on Economic Instruments and Disincentives to Sound Environmental Practices, Economic Instruments and Disincentives to Sound Environmental Practices, Final Report of the Task Force, November 1994, 81 pp.

The first part of the report fed into the consultations for the 1995 federal Budget. The second part presented longer term considerations covering ecological tax reform, transport, waste, air quality, water and conservation.

Following the report of this Task Force, the NRTEE began making annual budget submissions on sustainable development. In 2000, the NRTEE initiated a second stream of work, to examine a more integrated "ecological fiscal reform." A report from this stream appeared in 2002:

NRTEE, Toward a Canadian Agenda for Ecological Fiscal Reform: First Steps, 54 pp., 2002.

The report defines Ecological Fiscal Reform (EFR) as a "strategy that redirects a government's taxation and expenditure programs to create an integrated set of incentives to support the shift to sustainable development." This is a wider concept than Ecological Tax Reform, a direction more prevalent in Europe that involves shifting taxes onto pollution or energy and away from labour or capital. EFR is seen as part of a policy mix, of which the other components are traditional command-and-control, and voluntary/informational tools, all supported by institutional capacity.

The report briefly reviews the international experience with EFR. In Europe, in a first wave, the Nordic countries and The Netherlands introduced green tax reforms starting in 1988. A second wave began after 1996 and involved several other countries including the UK. The

magnitude of related tax revenues remained modest, exceeding 1% of total revenues only in Sweden and Denmark. The US has not used broad approaches, introducing instead a range of specific, targeted measures. Canada has generally followed the US model, including direct expenditures such as the $3 billion Green Plan in 1990. Overall, the Canadian experience with EFT was found to have been limited.

The report advocates consideration of a range of instruments: market-based measures including subsidy redirection; direct program expenditures; and institutional support and capacity building.

Lessons are drawn from three case studies: Agricultural Landscapes, which examined environmental farm plans and other conservation measures; Cleaner Transportation measures such as favouring cleaner fuels and engines in freight and public transit; and environmental management of chemicals through voluntary programs.

There are no further reports from this workstream listed on the NRTEE web site.

The "roadmap to combating climate change" by the 3Cgroup ([108]) set out some criteria that abatement technologies should meet to qualify for public support:

- *they must have high abatement potential;*
- *current and feasible future cost must be substantially different;*
- *the gap must be largely a function of economies of scale;*
- *there must be substantial first-mover disadvantage; and/or*
- *the learning curve must be steep.*

7.3.3 Product and industrial policy, and sustainable consumption

In July 2008 the EU's European Commission presented a series of proposals on sustainable consumption and production that are "intended to contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies." The proposals also seek to encourage EU industry to take advantage of opportunities to innovate. The Commission notes that "the great challenge faced by economies today is to integrate environmental sustainability with economic growth and welfare by decoupling environmental degradation from economic growth and doing more with less." It claims that "sustainable consumption and production maximizes business' potential to transform environmental challenges into economic opportunities and provides a better deal for consumers."

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[108] **Combat Climate Change (2007:21-23)**, *ref. section 1.3.*

The building blocks of the European Union's policy on sustainable consumption and production include its Integrated Product Policy (initiated in 2003), its Ecolabel Scheme, an Environmental Technologies Action Plan, Green Public Procurement, and a Directive on Eco-design of Energy Using Products. At present the key document is:

Commission of the European Communities, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, SEC(2008) 2110 and SEC(2008) 2111, Brussels, 16 July 2008, COM(2008) 397, 13 pp.

The proposals are to be considered by the European Parliament in March 2009 and to be implemented through regulations within two years.

A Pollution Probe report written with a financial contribution by Industry Canada (Office of Consumer Affairs) examined what role voluntary product standards can play in promoting sustainable consumption and production:

Bruce J. Farquhar, Krista Friesen, Elizabeth Everhardus and Ken Ogilvie, Environmental Aspects of Product Standards: The Role of Voluntary Environmental Standards in Sustainable Consumption and Production, Pollution Probe, June 22, 2007, 87 pp.

The report notes the various way in which the environmental impact of products can be reduced: through prevention (e.g., by cleaner production, project planning, etc.), recycling (incl. reusing), purification or cleaning, and redressing (e.g., restoration). It then explains how product or process standards can incorporate these ways. The main model is the EU, with its initiatives, practices and proposals. Incorporation of environmental considerations in international standards making is also documented (work by ISO and its sister organization, the International Electro-technical Organization, IEC).

Programs and activities by Environment Canada's National Office of Pollution Prevention and others, including work in the context of the UN's Marrakech Process,([109]) are acknowledged,

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[109] The Marrakech Process is in fulfillment of the 2002 Johannesburg Summit plan of implementation which called for "a global framework for action on sustainable consumption and production." Its goals are "to assist countries in their efforts to green their economies, help corporations develop greener business models, [and] encourage consumers to adopt more sustainable lifestyles." Seven task forces and 45 "cleaner production centers' have been established and the first draft of a 10-year framework of programs was released in September 2008. DFAIT has the lead on the Marrakech process in Canada. This work is to be concluded at the 19th meeting of the Commission on Sustainable Development (CSD) in 2011. Web site:

but Canada is characterized as running well behind Europe and even the US in providing leadership to have standards incorporate sustainable consumption and production objectives.([110]) Contrasts between the jurisdictions in the case of mercury control are spelled out as a case study.

An inventory of practices in OECD countries can be found in:

OECD, Promoting Sustainable Consumption – Good Practices in OECD Countries, 2008, 61 pp.

Areas of policies or programs in effect are: standards and mandatory labels, taxes and charges, subsidies and incentives, communication campaigns, education, voluntary labeling, corporate reporting, advertising, and public procurement. Final chapters summarize work on understanding consumer behaviour, initiatives that combine policy instruments in the areas of energy, waste, personal transport, food, and tourism, and comments about 'institutionalizing' sustainable consumption (through legal frameworks or other overarching strategies).

(For more by the OECD, see their Environment Directorate - Consumption, Production and the Environment: http://www.oecd.org/department/0,3355,en_2649_34289_1_1_1_1_1,00.html .*)*

Casting a wider net still, is a recent UNEP publication:

UNEP, Planning for Change – Guidelines for National Programmes on Sustainable Consumption and Production, 2008, 106 pp.

The report finds 30 countries around the world where governments are doing something in the area of Sustainable Consumption and Production (SCP). The Guidelines are intended to

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http://esa.un.org/marrakechprocess . A database of 133 sustainable consumption and production initiatives is available on the UN web site http://webapps01.un.org/dsd/scp/public/Welcome.do .

[110] The **External Advisory Committee on Smart Regulation** reported in **September 2004 (Smart Regulation – A Regulatory Strategy for Canada, 145 pp.)**, available at http://epe.lac-bac.gc.ca/100/206/301/pco-bcp/committees/smart_regulation-ef/2006-10-11/www.pco-bcp.gc.ca/smartreg-regint/en/08/rpt_fnl.pdf . In response, the government issued its **April 1, 2007 Cabinet Directive on Streamlining Regulation** (http://www.regulation.gc.ca/directive/directive00-eng.asp). The Pollution Probe report , while acknowledging that the Directive does not constrain the use of voluntary standards, finds it "more directed at constraining the use of regulation as a policy tool than creating a 'system' in which regulation and voluntary standards work together to accomplish public policy goals, such as a clean environment" (p. 55).

"provide advice to governments and other stakeholders on how to plan, develop, implement and monitor a national SCP programme." The report succinctly states the rationale for these Guidelines:

> Promoting and adopting sustainable consumption and production patterns is a global concern. Today more than ever, in a context of climate change, it has become clear that our global community urgently needs to adopt more sustainable lifestyles to both reduce the use of natural resources and CO2 emissions. This is crucial in order to decouple economic growth from environmental degradation; as well as to create the "space" for the poor to meet their basic needs. (P. 14)

It sets out the elements of national SCP programmes, the first one of which is "National commitment and leadership." Ten steps (tasks) are outlined. A special chapter is devoted to detailed analysis and advice on Indicators of SCP. A final chapter discusses case studies of nine countries and concludes with "lessons learned." ([111])

7.3.4 Public information and education

Often tied in with sustainable consumption and production policies are actions to inform the general public. In this regard, a Pollution Probe report, supported by Industry Canada, discussed four topics in exhaustive detail:

Pollution Probe, <u>Making Informed Choices: Public Information and the Environment</u>, August 2002, 26 pp. plus Appendices (109 pp.)

For drinking water quality; product labels and environmental certification programmes; environmental certification of forest products; and housing/indoor environments, the report asks: Who collects the information? Who validates or verifies it? When was it first made available, and by whom? What does the information tell, and not tell, the public? How does the public use or respond to the information? How current is it? Canada is compared with provincial and other jurisdictions.

In December 2002, the UN General Assembly designated 2005 to 2014 as the UN Decade of Education for Sustainable Development. UNESCO is the lead agency. (Ref.: http://www.unesco.ca/en/interdisciplinary/ESD/default.aspx *.)*

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[111] Chapter 21 of **Hargroves and Smith (2005: 407-429)** also offers a thorough discussion of sustainable consumption and production, largely based on earlier UNEP and other reports.

In October 2007 the Canadian Council of Ministers of Education reported to UNESCO on the state of education for SD in Canada:

Canadian Council of Ministers of Education, Report to UNECE and UNESCO on Indicators of Education for Sustainable Development – Report for Canada, October 2007, prepared in collaboration with Environment Canada and the Canadian Commission for UNESCO, 75 pp. (Ref. http://www.unesco.ca/en/activity/education/documents/FINALCanadaESDReportOct2007ApprovedEN_000.pdf .)

The report covers the period 2005-2007 in all Canadian jurisdictions at all levels of education, formal and informal. It is noted that three Canadian universities have UNESCO Chairs that "focus on education for sustainability and the environment and sustainable development." These are at York, Laval and UQAM.

7.3.5 Indicators

7.3.5.1 About sustainability indicators

Great effort on the part of many has gone into developing indicators of progress towards greater sustainability. While none of these cater specifically to how business is progressing towards sustainability, credible and meaningful indicators nonetheless provide the societal context within which businesses operate.([112])

The 1987 Brundtland report called for better measures, as did the 1992 Earth Summit and the resulting Agenda 21. In November 1996 an international group of experts gathered at the Rockefeller Foundation's Center in Bellagio, Italy. Out of that conference, under the leadership of the International Institute for Sustainable Development, emerged the "Bellagio Principles for Assessment:"

IISD, Assessing Sustainable Development – Principles in Practice, 1997, 175 pp.

By consensus the conference adopted a set of principles under four headings: Vision, Content/Priorities, Process, and Capacity. The Principles, ten in all, provide a useful checklist for anyone wishing to develop sustainability indicators.

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[112] Some indicators are being developed at the sector level: See section 3.8.2 on the pulp and paper industry, section 3.8.3 on FPAC's work and section 3.17 on the steel industry.

In Canada, the **Canadian Sustainability Indicators Network (CSIN)**, *a network spanning government, academia and the private sector, aims to further "sustainability indicator best practices in Canada." (Ref.* **http://csin-rcid.ca** *.) The network has a listserv and offers on-line Learning Events. Its web site is being revamped.*

The World Bank, in December 2002, published a thoughtful state-of-the-art discussion paper on indicators:

Lisa Segnestam, Indicators of Environmental and Sustainable Development – Theories and Practical Experience, World Bank Environmental Economics Series, Paper No. 89, December 2002, 61 pp.

The paper reviews definitions, the various conceptual frameworks for indicators, practical constraints, and more. The discussion is detailed but not mathematical.([113])

The most elaborate frameworks discussed are the "themes" option adopted by the UN Commission on Sustainable Development in 2001; and "DPSIR" – which stands for Driving force - Pressures - State - Impact - Responses.

Figure 10: Indicators: The Drivers-Pressures-State-Impact-Responses Framework

Two consultants, a systems analyst and a biologist, in 1999 offered a critical perspective on indicator development. Enriched by further experience, in 2008 they brought out a second edition of their book:

Simon Bell and Stephen Morse, Sustainability Indicators – Measuring the Immeasurable?, Second Edition, 2008, Earthscan, 228 pp.

After a first chapter discussing the various concepts of SD (already noted in Sidebar 1), extensive background is provided for a contrast between the UN's "Maximum Sustainable Yield" for fisheries and a Dutch model (AMOEBA) that is broader in scope and includes a visual representation of the data more appealing to decision-makers. Via an excursion into indicator development for cities, institutions and projects, the second half of the book asks fundamental questions such as whose vision is represented in the sustainability indicators chosen, how they are to be chosen, etc.

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[113] For a thoroughly technical discussion and guidelines on the construction of composite indicators, applicable to industrial competitiveness, sustainable development, globalization and innovation, see **Handbook on Constructing Composite Indicators – Methodology and User Guide, OECD Statistics Working Paper, 9 August, 2005, STD/DOC(2005)3, 108 pp.**

The scientific or technocratic approaches (which both rely on reductionism) are contrasted with a more holistic, systems view that leaves room for a range of approaches. Four examples are worked up, along two axes: between explicitly and implicitly systemic, and between largely analytic and largely descriptive or comparative. In the end the authors propose a "Systemic Sustainability Analysis" (SSA) – a work in progress. A chapter is devoted to their example of an SSA, the Imagine Project, applied to Mediterranean coastal zone management and to sustainable communities in the UK. They conclude that a participatory, subjective and empowering approach is preferable – "sustainability is the mindset of those who are intimately entwined with its achievement, and not an entity that lies 'outside' of our heads" – it is not a mountaintop to be climbed.

Comment. This is an odd and uneven work. Its narrative is convoluted enough that a diagram is repeated at each new chapter to show how the new discussion relates to the rest. The authors do not shy away from words like administrational, projectified and systemisism, while at the same time often talking down to the reader and sometimes descending into detail that seems designed primarily to impress. Views or experiences of others are often introduced with an unhelpful "interesting," whereupon follows a long discussion of all weaknesses and defects of the proposition or practice. In the end, its own offerings become "psycho-analytic" and transcend their purported subject by seeking "knowing beyond measurement." Governments nor almost any other stakeholders are likely to find favour with such a direction in indicator development.

7.3.5.2 Actual indicators

As noted, the UN Commission on Sustainable Development maintains a set of indicators in a "theme" framework. See:

Indicators of Sustainable Development – Guidelines and Methodologies, Third Edition, October 2007, Department of Economic and Social Affairs of the United Nations Secretariat, 94 pp. Ref.: http://www.un.org/esa/dsd/dsd_aofw_ind/ind_index.shtml .

For more background on UN-level SD indicators, see:

László Pintér, Peter Hardi and Peter Bartelmus, Sustainable Development Indicators – Proposals for a Way Forward, prepared for a meeting of experts on behalf of the UN Division for Sustainable Development, IISD, December 2005, 35 pp.

The OECD initiated a programme on environmental indicators in 1989. Its Environment Directorate maintains a data base (SIREN - System of Information on Resources and the

Environment) and annually publishes "Key" environmental indicators. The background paper with detailed descriptions is:

OECD Environmental Indicators – Development, Measurement and Use, Reference Paper, 2003, 37 pp. (http://www.oecd.org/dataoecd/7/47/24993546.pdf)

The OECD's "Core" set contains 40 to 50 indicators. In 2001, OECD Environment Ministers agreed to publish 10 "Key" indicators for the purpose of informing the public. (Supplementary sets are sectoral, indicators derived from environmental accounting, and others that focus on the degree of decoupling of environmental pressures from economic growth.)

The most recent issue of the Key Indicators is:

OECD, Key Environmental Indicators, OECD Environmental Directorate, Paris, 2008, 36 pp. (http://www.oecd.org/dataoecd/20/40/37551205.pdf)

The indicators are generally consistent with the pressure-state-response model. The ten indicators cover:

- pollution issues: CO2 emissions, ozone layer, air quality, municipal waste generation, and waste water treatment; and
- natural resources and assets: intensity of use of water, forest and fish resources, of energy use, and number of threatened species.

Two pages on each indicator cover the policy challenges, measuring issues, trends, data for almost all OECD countries, and notes on related Core indicators.

The fourth annual report on Canadian Environmental Sustainability Indicators (CESI) *became available on March 12, 2009, reflecting data to 2006:*

Government of Canada, Canadian Environmental Sustainability Indicators – 2008 Highlights, 10 pp.

As in previous editions, the report has two indicators for air quality, a freshwater status measure, and volumes of greenhouse gasses and their sources. This fourth report makes some comparisons with other countries.

The report and earlier versions are available from the government's "Sustaining the Environment and Resources for Canadians" web site, http://www.environmentandresources.gc.ca . These indicators are the result of collaboration by Environment, Health, and Statistics Canada.

The full Statistics Canada report on CESI is Catalogue Number 16-251-XIE (2007, 58 pp.)

The GHG data in these reports are based on annual **Environment Canada** *reports to the UN, most recently issued in May 2008. The* **National Inventory Report: Greenhouse Gas Sources and Sinks in Canada, 1990-2006**, *is available at* http://www.ec.gc.ca/pdb/ghg/inventory_e.cfm. *The archive (from 1999 forward) is at* http://www.ec.gc.ca/pdb/ghg/inventory_report/inventory_archi_e.cfm. *Like Natural Resources Canada's data on energy use and efficiency (see Appendix B), these data, to a significant degree, allow one to trace the sources of GHG emissions to business sectors, but not according to size of business.*

Aiming higher, specifically, to replace the standard GDP as an indicator of a nation's progress, is the Genuine Progress Indicator (GPI) *promoted by* Redefining Progress, *an organization founded in 1994. It is headquartered in Oakland, California and has an office in Washington, D.C.*

Ref.: **Redefining Progress,** web site **http://www.rprogress.org .**

> At the national level, the GPI aims to be "an alternative to GDP that takes inequality, environmental degradation, and debt into account as well as the benefits associated with housework, parenting, volunteering and higher education." This "Footprint of Nations" (calculated for most countries around the world) is based on 72 product categories and compared with the country's "Biocapacity."
>
> The analysis also can be performed at the scale of municipalities, regions, businesses or individuals.

Much of the language used by Redefining Progress is almost identical to that used by the Global Footprint Network:

Ref.: **Global Footprint Network,** web site **http://footprintnetwork.org .**

> The Network was established in 2003. Its Executive Director is Mathis Wackernagel who in 1990, with his doctoral dissertation supervisor at UBC, William Rees, was the co-creator of the "Ecological Footprint" methodology. Like GPI, it is also headquartered in Oakland, but has offices in Zürich and Brussels.
>
> Footprint analysis measures "how fast we consume resources and generate waste" and compares it to "how fast nature can absorb our waste and generate new resources." The analysis is scalable to the world, nations, cities, businesses or individuals. It aims to be "a measurement tool that makes the reality of planetary limits relevant to decision-makers."

A collaboration between Yale and Columbia Universities has resulted in two editions of an Environmental Performance Index*:*

Ref.: **Environmental Performance Index,** web site **http://epi.yale.edu .**

After a pilot in 2006, an Index for 133 nations was published in 2008. The index is based on 25 indicators for either "Environmental Health" or "Ecosystem Vitality." Harking back to the dualism of old, this division is justified as relating to environmental policies for humans ("reducing environmental stresses to human health") and nature ("promoting ecosystem vitality and sound natural resource management") respectively. These two are then weighted equally to arrive at the final index value. The result is an odd rank order of nations that somewhat defies insight.

The same universities also sponsor an Environmental Sustainability Index*, most recently published in 2005:*

2005 Environmental Sustainability Index – Benchmarking National Environmental Stewardship, Yale Center for Environmental Law and Policy, Yale University and Center for International Earth Science Information Network, Columbia University, 2005, 63 pp. Also: **Summary for Policymakers, 8 pp.** Ref.: **http://sedac.ciesin.columbia.edu/es/esi** .

Seventy-six variables are distilled into 21 indicators which are equally weighted to obtain a final index value for 144 countries. The indicators refer to five themes or components: environmental systems (5 indicators), reducing environmental stresses (6), reducing human vulnerability (3), social and institutional capacity (4), and global stewardship (3). In the terminology of Segnestam (2002), the indicators cover Pressure, State and Response measures. As with the Environmental Performance Index, again the lessons to be drawn from the resulting rank order are somewhat elusive, but the authors claim that the analysis "reveals some of the critical determinants of environmental performance: low population density, economic vitality, and quality of governance."

The Federation of Canadian Municipalities developed a Quality of Life Reporting System*:*

FCM, Quality of Life Reporting System – Highlights Report 2004, 36 pp. Web site: **http://www.fcm.ca/english/view.asp?x=477**

Twenty municipalities participate in the System. Seventy-five indicators were tracked over 1991-2001, covering the local economy, the natural environment, personal goals and aspirations, fairness and equity, basic needs, and social inclusion. It found that "the quality of life has deteriorated for a significant number of people" over the period.

A subsequent report, using the same data, focused on trends in population, income and economic growth, solid waste, transportation and air quality, and water supply:

FCM, Growth, the Economy and the Urban Environment, Theme report #3, 2005, 40 pp.

The report concluded: "The scale and complexity of the challenge of managing growth to achieve sustainable development often place matters beyond the scope of any one municipality. ... many of the measures needed to manage growth and protect the environment are the responsibility of provincial or federal governments."

Rather than attempting to capture trends or comparative data applicable uniformly to a range of entities, several municipalities or regions have embarked on an indicator project tailored to their circumstances. These include Hamilton, Calgary (using the Footprint framework), GPI Atlantic, Winnipeg, Seattle, Guadalajara and Vancouver. ([114])

An earlier report on the subject is from the NRTEE. It stems from an Environment and Sustainable Development Initiative that was announced in the 2000 federal Budget. The report was released in 2003:

NRTEE, Environment and Sustainable Development Indicators for Canada, 2003, 54 pp. plus Appendices.

The report recommended that Statistics Canada annually issue five indicators: on air quality, freshwater quality, greenhouse gas emissions, forest cover, extent of wetland, and human capital. It noted that the wetland indicator was the only one that could not be calculated with presently available data.

From the same period dates an earlier effort by Environment Canada, still available in archive on its web site:

Environment Canada, Canada's National Environmental Indicator Series 2003.
Ref.: http://www.ec.gc.ca/soer-ree/English/Indicator_series/default.cfm. The archived material is at http://www.ec.gc.ca/soer-ree/English/Indicators/default.cfm .

Various indicators covered ecological life-support systems, human health and well-being,

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[114] *Ann Dale of Royal Roads University hosted an e-Dialogue on the subject on May 13, 2008 in which participants in several of these initiatives took part. Ref.:* http://crcresearch.org/files-crcresearch/File/Indicators%20e-Dialogue%20.pdf

natural resources sustainability, and human activities. There were 55 technical supplements to the work.

This is also when Environment Canada issued two background papers:

Wayne Bond, Dennis O'Farrell, Gary Ironside, Barb Buckland, and Risa Smith, Current Status, Trends, and Perceptions regarding Environmental Indicators and State of the Environment Reporting in Canada, Background paper to an "Environmental Indicators and State of the Environment Reporting Strategy, 2004–2009," National Indicators and Reporting Office, Environment Canada., 2005. Available at: http://www.ec.gc.ca/soerree/English/resource_network/bg_paper1_e.cfm .

Wayne Bond, Dennis O'Farrell, Gary Ironside, Barb Buckland, and Risa Smith, Environmental Indicators and State of the Environment Reporting: An Overview for Canada, Background paper to an "Environmental Indicators and State of the Environment Reporting Strategy, 2004–2009," National Indicators and Reporting Office, Environment Canada, 2005. Available at: http://www.ec.gc.ca/soer-ree/English/resource_network/bg_paper2_e.cfm .

The papers reflect the state of knowledge as of 2003. The first discusses the need for a national strategy and the forces shaping evolving practices. It also provides results of a survey of 37 environmental indicator practitioners. The second documents existing indicator initiatives at all three levels of government as well as some international efforts.

7.3.6 Governance

Given the scope of the sustainability challenge and the interconnectedness of its many components, it is no wonder that various actors, and researchers, have reflected on ways of governing the process. "Governance" here has a very different meaning than in the corporate context. ([115])

Specifically, at least ever since Rio 1992 and explicitly since Johannesburg 2002, partnerships, and the study of partnerships, has been in the ascendancy. Three Dutch researchers reviewed the literature to 2006:

Mariëtte M. Van Huijstee, Mara Francken and Pieter Leroy (2007), "Partnerships for sustainable development: a review of current literature," *Environmental Sciences*, vol. 4 no.2 (2007), pp. 75-89.

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[115] *For a discussion of governance in the context of carbon pricing, see* **NRTEE (2009)**, *Chapter 6.*

Defining partnerships as "collaborative arrangements in which actors from two or more spheres of society (state, market and civil society) are involved in a non-hierarchical process, and through which these actors strive for a sustainability goal," the authors review the literature from two perspectives: institutional, and the actors'. Case studies of partnerships reveal the various roles they can play. There is no unanimity on what the partnership phenomenon means for democracy. Actor-oriented literature invariably ends in "practical recommendations on when, how and with whom to partner." How to build trust is a common theme.

The authors summarize the advantages and disadvantages of partnerships, and their common success factors, in two small tables (see Figure 11). In conclusion, the paper notes that both strands of literature fail to deal with the fundamental issue: do partnerships contribute to SD? Are partnerships effective? They suggest areas of research.

Figure 11: Advantages, risks and common success factors for intersectoral partnerships

An equally recent book-length contribution to the literature is:

Pieter Glasbergen, Frank Biermann, and Arthur P.J. Mol (editors), Partnerships, Governance and Sustainable Development: Reflections on Theory and Practice, Edward Elgar Publishing, 2007 [2008], 314 pp.

The introductory chapter asks "what institutional arrangements are the most promising in order to advance the process of progressive change." It contrasts the state-centric approach (the basis for most sustainability policy) with a pluralistic approach which is more open-ended. It sets out the main premises of what it calls "The Partnership Paradigm" and then discusses partnerships from three angles: partnerships as collaborative arrangements, as steering mechanisms, and the impact of partnerships on political (liberal-democratic) decision-making structures.

There is a full chapter on business-NGO partnerships. Another chapter, by Neil Gunningham, is on the experience with environmental partnerships in Australian agriculture. James Meadowcroft, of Carleton University, contributes a chapter on "Democracy and accountability." In the final part, on the future of partnerships, one chapter asks: "Multi-stakeholder partnerships for sustainable development: does the promise hold?" The question is examined considering three deficits: the regulatory deficit, an implementation deficit, and a participation deficit. In all three cases, largely based on partnerships at the global level, ([116]) the answers are largely negative: in most instances, partnerships have not helped alleviate these deficits.

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[116] Some 400 transnational partnerships dealing with sustainability are registered with the UN.

The final chapter, while less bleak in its assessment, nonetheless confesses that we do not yet fully understand the emergence of multi-stakeholder partnerships since the mid-1990s though some of the context of the time may have contributed (globalization, privatization, deregulation, decentralization), as has the professionalization of the NGO community. There is still no conceptual clarity about partnerships, making comparisons difficult. It remains unclear whether they will end up as a footnote in world history or whether we are seeing the beginning of a main type of governance.

A lucid paper prepared for the OECD describes the state of practices in 21 jurisdictions circa 2006:

Darren Swanson and László Pintér, Governance Structures for National Sustainable Development Strategies – Study of Good Practice Examples, IISD, October 1, 2006, 40 pp.

What twenty countries (including Canada) and the EU are doing with regard to national SD strategies is examined in accord with eight criteria covering six government elements. In each, two or more typologies are distinguished and corresponding good practice examples are described in some detail. Canada's approach appears quite unique in a few respects.([117])

The paper suggests that national development strategies and efforts towards greater accountability are a perfect match and sees integration of the sustainability concept with planning and budgeting processes as the best way forward for an effective national SD strategy.

Finally, while quite recent we leave as last a mention of a 3-year effort by nineteen research institutions in ten European countries. The EPIGOV Project had its Final Policy Conference in Brussels on 23 January 2009. (Ref.: http://www.ecologic.de/projekte/epigov/ *.) The project sought to find out "which modes of governance are used to improve environmental policy integration (EPI) at different levels of governance" and what their effects are. A slide presentation by the project's coordinator, Ingmar von Homeyer, at the final conference concludes that EPI has met with limited success, constrained as it is by "institutions, capacities and political culture." Despite three years of research, "Longer-term implications for a more comprehensive and sustained greening of sectoral international institutions remains unclear."*

[117] No other country vests an SD role in an office of the Auditor General. No other country has attempted departmental SD strategies without an overarching policy.

7.3.7 Energy policy

Analyses and recommendations to governments regarding energy policy abound, increasingly so since climate change has risen to broader awareness. We make no attempt to do justice to this literature and only signal two recent Pembina Institute reports, the most recent one directed to Alberta, and one from late last year about Ontario.

Jeff Bell and Tim Weiss, Greening the Grid – Powering Alberta's Future with Renewable Energy, The Pembina Institute, January 2009, 93 pp.

The report aims to refute the government of Alberta's assertion on December 11, 2008 ([118]), that "alternative and renewable energy sources ... cannot match the importance to Alberta of 'clean' fossil fuels." Following a detailed analysis of the history and current composition of energy sources of Alberta's electricity grid, the report describes the alternative technologies (efficiency, wind, co-generation, etc.) and then develops a "business as usual" (i.e. mainly coal-based), a "pale green," and a "green" scenario to meet demand over the next 20 years. "Pale green" sees the alternatives developed to the point that no new coal plants are necessary; "green" would allow beginning to phase out existing coal plants.

The report has little to say about costs. It recommends establishment of a Renewable Electricity Task Force.

Cherise Burda and Roger Peters, Plugging Ontario Into A Green Future – A Renewable is Doable Action Plan, The Pembina Institute and five other NGOs, November 12, 2008, 48 pp.

The report responds to the Ontario government's direction to the Ontario Power Authority (OPA) to "revisit" its 20-year electricity plan.([119]) It sets out a seven-step action plan for greening Ontario's power supply, obviating the need to either refurbish or replace the Pickering B and Bruce B nuclear stations.

On March 11, 2009, the Ontario government tabled **Bill 150**, *the* **Green Energy and Green Economy Act**. *It is intended mainly to facilitate the generation of renewable energy. It provides for a feed-in tariff, a 'right to connect' and a streamlined approval process. Home energy audits*

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[118] **"Government of Alberta, News Release, 11 December 2008.**

[119] **"Amendment to the Supply Mix Directive,"** issued **17 September 2008**, available at http://www.powerauthority.on.ca/Storage/83/7831_Ministry_Directive_PSP_Sept_18_08.pdf . A revised Integrated Power System Plan is due six months from the date of the Directive.

would become mandatory upon sale of a home. The next day, the OPA announced North America's first feed-in tariff for renewable energy sources.([120]) In an Op-Ed, Cherise Burda congratulated the Ontario government for bringing forward the Act and suggested that replacing Pickering B (which is expected to go off-line in 2013) "with renewable energy, clean distributed power, conservation and efficiency would be a real test of the reach and success of the new Green Energy Act."([121])

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[120] *Ref.:* **Ontario Power Authority, "Price Guarantees for Large and Small Renewable Energy Projects will Create Jobs,"** *available at http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6858 .*

[121] *Op-Ed published in* ***The Toronto Star*** *of* **24 February 2009**, *i.e., before the Act was introduced; also available on the Pembina Institute web site.*

7.4 How governments can help business

A 2007 survey of over 10,000 members of the Canadian Federation of Independent Business (CFIB)([122]) included questions on the government's role in managing environmental issues:

CFIB, Achieving Eco-prosperity – SMEs' perspectives on the environment, March 2007, 36 pp.

Seventy-nine percent of respondents believed that "It is possible to grow the economy and protect the environment at the same time." Almost all respondents "strongly" or "somewhat" supported government initiatives to "raise awareness of energy efficiency," "support research on alternative energy sources," "provide financial incentives for energy efficiency," and "working with businesses to develop environmental plans and assist them both financially and technically."

But perhaps more remarkable was the support for "enforcing current regulations and fines on businesses that do not comply with environmental laws" (50.5% did so strongly, 35.1% somewhat); 40.8% strongly and 34.1% somewhat supported "increasing" such regulations and fines; and 15.4 and 32.6% respectively even supported "introduction of taxes or financial penalties to deal with environmental issues."([123])

On a specific topic, fuel quality standards, a report for the Association of International Automobile Manufacturers of Canada, came to a similar conclusion:

Jesse Row and Alex Doukas, Fuel Quality in Canada – Impact on Tailpipe Emissions, prepared for the Association of International Automobile Manufacturers of Canada, The Pembina Institute, November 26, 2008, 52 pp.

The report compares Canada's fuel quality standards with those in the US, the EU, Japan and Australia and finds Canada's decidedly weaker. It recommends that the federal government "follow leading jurisdictions and conduct a thorough review of opportunities to reduce transportation emission through improved fuel quality standards."

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[122] *See also annotations in section 2.1 and Sidebar 2.*

[123] These attitudes should be seen in the context of long-standing demands for SME-friendly regulation.

A report for the European Commission's Enterprise Directorate-General examined what governments can do to promote the uptake of environmental management systems by SMEs:

Commission of the European Communities, Public policy initiatives to promote the uptake of environmental management systems in small and medium-sized enterprises, Final Report of the Best Project Expert Group, Enterprise Directorate-General, January 2004, 105 pp.

The report reviews 24 good practices in 13 EU countries and formulates a large number of recommendations aimed at increasing the uptake of EMSs by SMEs. They range from organizational arrangements to direct subsidies, less formal approaches, and offering general or specific benefits.

Several reports based on the OECD-sponsored survey in 2003 of over 4000 manufacturing firms in seven countries (including Canada) provide some insight in desirable government policies:([124])

Nick Johnstone, Matthieu Glachant, Céline Serravalle, Nicolas Riedinger and Pascale Scapecchi, "'Many a slip 'twixt the cup and the lip': direct and indirect public policy incentives to improve corporate environmental performance," chapter 3 in Nick Johnstone (2007), pp. 88-131.

See also:

- **Nick Johnstone, "Environmental policy and corporate behaviour: policy conclusions,", pp. 260-265, chapter 7 in Johnstone (2007);**
- **Nick Johnstone, "Environmental Management, Performance and Innovation: Comparing SMEs with other Firms," presentation at ECAP-SME Workshop, 14 October 2005, 27 slides;** *and*
- **"Environmental Policy Mixes: Motivations, Evidence & Effectiveness, Presentation by Nick Johnstone, OECD Environment Directive, at CAFÉ/NEBEI Conference on 'Policy Instruments to Reduce Air Pollution', November 11-12 [2004?], Brussels, 14 slides.**

The authors conclude that perceived policy stringency and frequency of inspections are consistently significant in explaining environmental performance, as is the presence of an EMS. Among targeted incentives for firms to adopt an EMS, financial support and reduced inspection frequency are the most important. For SMEs, the provision of information also has a positive effect on environmental performance.

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[124] *See section 2.4.3.4 for discussion of this survey's data base and its findings on EMS uptake, including a fuller annotation of* **Labonne (2006)**.

Julien Labonne, A comparative Analysis of the Environmental Management, Performance and Innovation of SMEs and Larger Firms, for the European Commission, Directorate-General Environment, Final report, 31 August 2006, CL Conseil, Saint Michel Sur Orge, France, 44 pp.

Exhibits similar results, broken down by size of firm. The frequency of inspections and the perceived stringency of enforcement both rise with increasing firm size. When examining the likelihood of a firm taking concrete actions, it is found that SMEs are likely to be influenced by the frequency of inspections, while larger firms are not. Similarly, performance-based standards, pollution taxes, and financial incentives increase the likelihood of concrete actions being taken by SMEs, while larger firms do not exhibit this relationship.

The more stringent the perceived environmental policy, the more likely an SME will adopt end-of-pipe as opposed to pollution prevention measures. Labonne's report concludes that "supporting public policy programs (e.g. information provision and technical assistance programs) have a great role to play in modifying environmental behaviour among SMEs, and much more so than for larger firms."

Finally, we signal a research report comparing government approaches in the UK and The Netherlands:

Robert Rutherfoord, Robert A. Blackburn and Laura J. Spence, "Environmental management and the small firm – An international comparison," *International Journal of Entrepreneurial Behaviour & Research*, Vol. 6, No. 6 (2000), pp. 310-325.

The authors held 20 interviews with owners, directors or managers of firms in each of the two countries, equally divided between mechanical engineering companies and restaurants; the largest firm had 40 employees, several were sole proprietors. The article focuses on the difference in orientation found in the two countries. In the UK, businesses tend to see environmental management as an additional burden, yet the government's approach is largely to provide information and assumes that voluntary initiatives will drive change. In The Netherlands, the government's approach is part of consensus development, backed up by a system of inspections and municipal licensing; owners tend to see environmental management as part of their social responsibility.

Epilogue

> The state of green business is improving, slowly but surely, as companies both large and small learn the value of integrating environmental thinking into their operations in ways that align with core business strategy and bottom-line goals. Green business has shifted from a movement to a market. But there is much, much more to do.
>
> Joel Makower (2008:3)

We have come at the end of our long journey, the quest for what sustainability means for business. Here are the highlights of what we found.

- By the best evidence, climate change is only part of a more widespread degradation of the planet's ecosystems on which all life – and business! – depends.
- Mitigation of this degradation opens manifold opportunities for new businesses to spring up.
- Triple-bottom-line thinking, and adoption of some form of environmental management system (EMS), is applicable to all manner and every size of business. One of the best General Guides is written for Very Small Businesses.([125]) An excellent Risks and Opportunities tool is available for large businesses.([126]) Formal EMSs become more attractive the larger the firm, if the firm is profitable, and if there is effective regulation.
- Whether through cap-in-trade or as a carbon tax, or both, carbon emissions will soon carry a price.
- We could identify no fewer than 20 sector-specific initiatives or analyses pointing one way or another to greater sustainability.
- In many instances, in sector initiatives as well as more broadly, an elite group of very large corporations is the most advanced in integrating triple-bottom-line thinking into its decision making. This will affect smaller firms if they are part of the supply chain to these large firms.
- The resource theory of the firm appears best placed to identify winners and losers. Essentially however, the case that it pays to be 'green' has long been proven and perhaps it's time to move on to developing solid metrics for corporate applications of sustainability initiatives.

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[125] Joahannson (2007), reviewed in section 2.3.1.

[126] WRI et al. (2008), reviewed in section 1.1.

- While the practice is spreading, triple-bottom-line reporting is still long from being mainstream, especially in North America.

- There is a close correlation between good reporting and good performance. We highlighted the gold standard of reporting, the GRI Guidelines.([127])

- Moving to the capital market, it would seem that corporations probably should disclose more than they do, and that investment advisors must at least consider 'ESG' information.([128])

- A strong majority of studies analyzing the relationship between stock market prices and some sort of ESG measure find that there is a sustainability premium. Companies that score well on ESG issues produce higher Total Returns, even in the current downturn.

- Responsible Investment practices have evolved from negative screening to selection of best-in-class to constructive engagement with individual firms. In the financial industry as a whole, consideration of ESG factors is gaining significant ground but is not yet a mainstream practice.

- Short-termism, and the obsession with quarterly earnings, is – well beyond the realm of sustainable-sensitive investing – an ailment that is not in the best interest of most stakeholders.

- Governments are indispensable partners if businesses are to succeed in becoming more sustainable.

- The 2008 federal *Sustainable Development Act* is intended to make departmental strategies more effective.

- Government leadership is particularly indicated regarding policies on Sustainable Consumption and Production.

- Apart from an abortive attempt by the NRTEE in 1997-99 to measure eco-efficiency,([129]) there are no Sustainable Development indicators that specifically track overall business sector performance.

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[127] Global Reporting Initiative, ref. section 5.3.

[128] "ESG" stands for Environmental, Social, Governance issues, factors, etc. Ref. Sidebar 1.

[129] National Round Table on the Environment and the Economy (1997, 1999), ref. section 2.4.1.

- The OECD's Key Environmental Indicators ([130]) are impressive in combining fact with measuring issues, policy challenges, trends, etc.

- More generally, the role of governments in helping businesses to become more sustainable may be categorized as follows:
  1- establish framework conditions through laws, regulations and creation of institutions;
  2- adopt policies, including fiscal policies and adoption of international treaties;
  3- provide incentives or subsidies;
  4- provide information (including technical assistance) and support information networks and partnerships;
  5- support research and research networks; and
  6- support pre-commercial pilot projects.

Where does one go from here? This *Narrative* aimed to increase awareness of the significance of more sustainable conduct on the part of businesses of all sizes. It is hoped that it will lead to governments placing higher priority on facilitating businesses' transition to greater sustainability.

Researchers and policy analysts – the other audience for which especially these *Annotations* were intended – hopefully will have made a few discoveries, gained some insights, and received guidance for their own work.

Future SME-related research could usefully examine the relevance and feasibility of high-quality industry-specific standards such as in chemicals and mining – standards that are binding on the majors – for the several thousand smaller firms that populate these industries but are not members of the association of majors.

There also is a dearth of carefully-constructed backcasting studies of Responsible Investment performance that are transparently reported.

Finally, the employment implications of a 'green' economy appear to be severely under-researched.

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[130] OECD (2008[1]), ref. section 7.3.5.2.

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APPENDIX A

The Small Business Contribution to Pollution

How much pollution is caused by small businesses? Unsubstantiated figures are often seen, but here is the first significant effort to answer that question for the approximately 15,000 SMEs with at least 20 employees in the 21 Canadian manufacturing industries:

Markus Biehl and Robert Klassen, How much Pollution do Canadian Small- and Medium-sized Enterprises REALLY Generate? - An Empirical Analysis of Pollution through the Manufacturing Sector, March 31, 2006, 75 pp., commissioned by IC/MIB.

The study distinguishes Small (20-99), Medium (100-499) and Large (500+) firms and uses both census and sampled data. NPRI-reported pollution data are aggregated to the controlling firm level. Pollution by non-reporters is estimated. Finds that SMEs are responsible for 13% of pollutant *quantity* and 17% of pollutant *impact* in their industry – far less than is usually thought to be the case.

There are significant differences between industries. Five emerge as prime targets for assistance and improvement: Primary Metals, Chemicals, Wood Products, Fabricated Metal Products, and Paper Manufacturing. In terms of impact per employee, Petroleum and Coal Products also warrant attention.

The paper concludes that an SME strategy for sustainable manufacturing is indicated that is targeted to these industries and geared to corporate head offices (rather than the facility level) of both SMEs and Large firms.

Comment: This is important new information. However, for a complete picture, one should not neglect the existence of the 83,000 manufacturing firms with fewer than 20 employees. Also, corporate headquarters may have less control over operations in their facilities than the authors assume (see in this regard a finding of the UN Global Compact's 2007 Annual Review, annotated in section 1.4). A multi-level strategy therefore seems indicated.

An earlier study:

Ontario Centre for Environmental Technology Advancement (OCETA), Analysis of Toxic Pollutant Loadings from Ontario Small- and Medium-Sized Manufacturers Reporting to the National Pollutant Release Inventory, 19 July 2002, 15 pp.

This study covers Ontario manufacturing only, and does not aggregate the NPRI data to the firm level. Separates the 912 reporting facilities into SMEs (5-500 employees) and Large firms (over 500 employees); SMEs make up 87% of the data set. Finds that, in 2000, SMEs were the source of 62% of the pollutant loadings; peak loadings were from the 100-199 size class.

One table notes that only a tiny fraction of manufacturing SMEs report to the NPRI.

A recent report on pollutant releases in North America is:

Commission for Environmental Cooperation, Taking Stock – 2004 North American Pollutant Releases and Transfers, September 2007, 152 pp.

None of the voluminous data are by size of firm, but one section (pp. 67-71) divides US and Canadian data into four groups, by volume of reported releases in 1998: "Smaller Reporters" are facilities reporting less 10,000 kg, "Medium Reporters" released 10-100,000 kg, "Larger Reporters" 100,000-1 million kg, and "Largest Reporters" more than 1 million kg. The report then finds that, over 1998-2004, the Smaller Reporters showed substantial increases, as did, though to a lesser degree, the Medium Reporters. The Larger and Largest facilities in the US decreased their pollutants while the Canadian data for these two groups are mixed.([131])

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[131] The increasing contribution by "SMEs" became the focus of press coverage of the CEC's report: See a Canadian Press story by **Michael Oliveira in *The Globe and Mail*, 18 October 2008** and an ***AFP*** story dated **17 October 2007**. As with export data, however, one should be careful not to equate "small/large polluters" with "small/large firms." (Ref: **Chris Parsley, More Important than was Thought : A Profile of Canadian Small Business Exporters, Small Business Policy Branch, December 2004**, available from www.ic.gc.ca/sbresearch.) In addition, like the OCETA study, all data refer to facilities, not firms.

APPENDIX B

Energy and SMEs

To a significant extent the analysis of climate change overlaps with that of energy use. There are many sources for data on energy including:

Natural Resources Canada, Energy Use Data Handbook, 1990 and 1997 to 2006, on-line.

--------- , Energy Efficiency Trends in Canada, 1990 to 2005, Twelfth Edition, 2008, 54 pp.

--------- , Improving Energy Performance in Canada - Report to Parliament under the Energy Efficiency Act, for FY 2004/05, 90 pp.

Commissioner of the Environment and Sustainable Development, Climate Change – 2006 Report by the Commissioner of the Environment and Sustainable Development, Office of the Auditor General of Canada, 28 September 2006.

However, these sources shed no light on the role of SMEs. Still, some overall context gleaned from these reports is noteworthy:

- From the NRCan reports: Of total GHG Emissions, in 2003, 1/3 came from each of Industry and Transportation, 14% from Commercial/Institutional, and 16% from the Residential sector. (Industry means Mining, Forestry, Construction and Manufacturing. Transportation is broken down between Passenger and Freight. Commercial/Institutional is broken down in up to ten 'Activity types' which somewhat resemble NAICS industries.) By far the largest increase since 1990 stems from the Commercial/Institutional sector.

- From the Commissioner's Report: 82% of the source of GHG emissions is energy use (Main Points, p. 39).

An older report:

COMPAS, Phase 3. Survey Findings: Energy Efficiency Programs for SMEs, May 2003, 58 pp. + Appendix, for Natural Resources Canada.

Based on a survey of 1000 Canadian SMEs in manufacturing and mining with between 50 and 499 employees. Describes attitudes towards energy efficiency, perceptions, and behaviour.

APPENDIX C

Selling the Business Case: Real Options (4)

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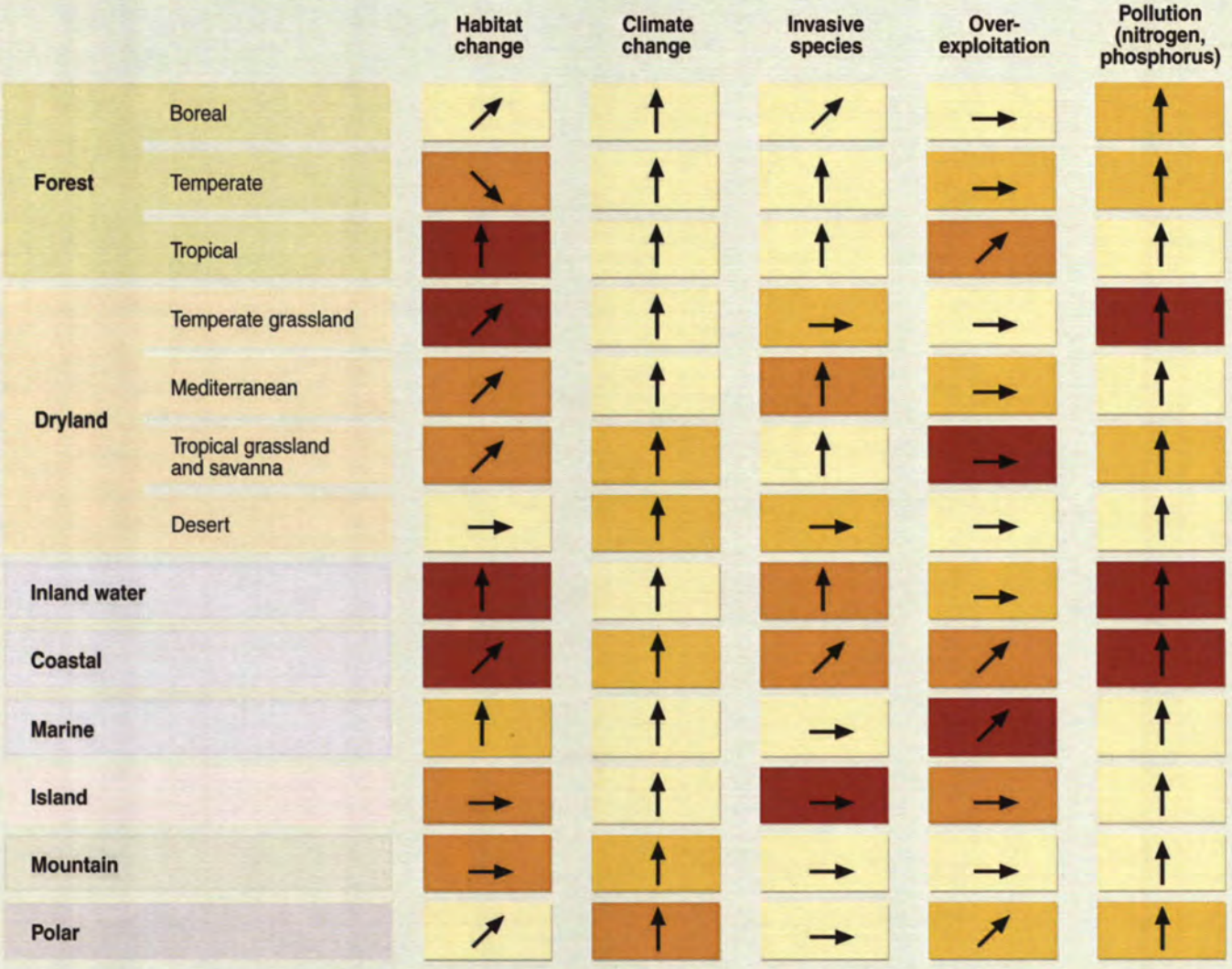
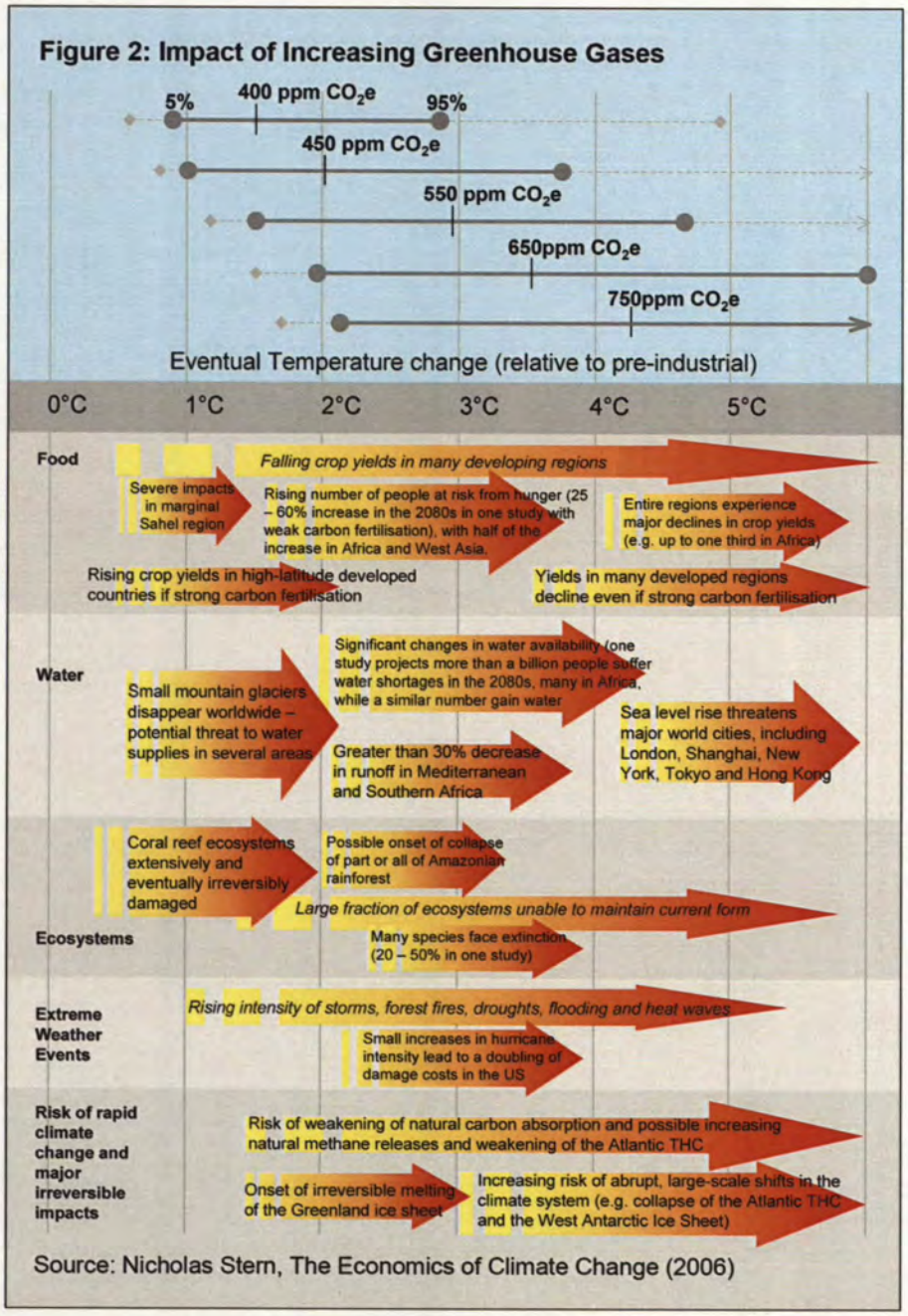
Figure 1: Main Direct Drivers of Change in Biodiversity and Ecosystems



Source: World Resources Institute, Opportunities and Challenges for Business and Industry (2005)

Figure 2: Impact of Increasing Greenhouse Gases



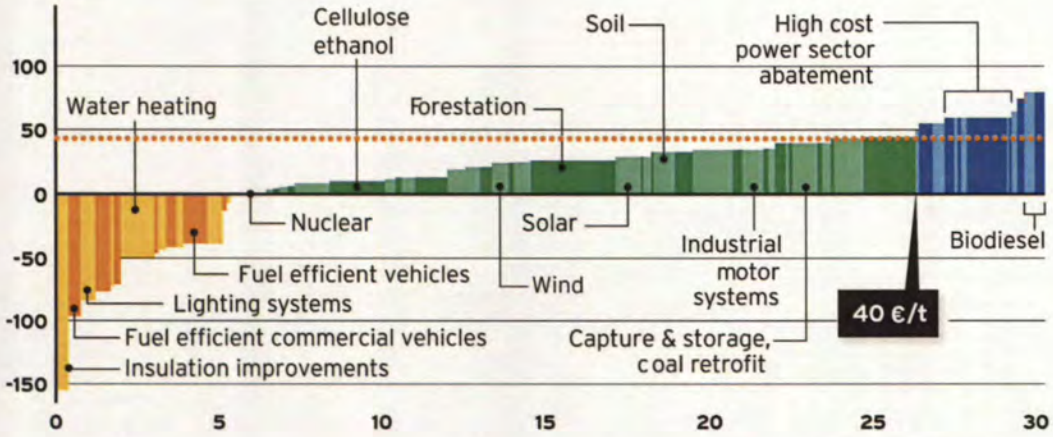
Source: Nicholas Stern, The Economics of Climate Change (2006)

Figure 3: Marginal Cost of Abatement of Greenhouse Gas Emissions

GLOBAL COST CURVE

Marginal cost of abatement - examples

€/t CO_2



Abatement potential
Gt CO_2 / year in 2030

Negative abatement marginal cost

Abatement marginal cost below €40/t

Abatement marginal cost above €40/t

Abatement at zero or negative cost

There is significant potential already at a zero or even negative abatement cost. This potential can mostly be found in the buildings and transport sectors. The costs included here are basically costs relating to additional investments and changes in operation and maintenance costs. The negative abatement costs stem from the fact that the additional investment costs are more than compensated for by a decrease in the costs for energy. In addition to these costs, it is likely that there are transaction costs, as well as more intangible costs relating to how people perceive the services rendered from different appliances.

Abatement below € 40 per tonne

Many abatement opportunities could be realized given a long-term and stable international system with a price on carbon dioxide of maximum € 40 per tonne. The majority of these measures have an economic lifetime of more than 15 years, which makes long-term and stable system essential for the unlocking of this potential.

Abatement above € 40 per tonne

Vattenfall has mapped a selection of abatement opportunities at a cost above € 40 per tonne. Some of these opportunities may be realized primarily because of the existence of other types of regulations. There is also a possibility to reduce the costs of these measures in the longer run, but this may require targeted innovation support, e.g. in the form of subsidies.

Source: Vattenfall, Climate Map 2030 (2007)

Figure 4: Abatement Potential by Industrial Sector and Region

$GtCO_2e$, 2030

	Regions						
Sector	**US and Canada**	**OECD Europe**	**Eastern Europe (incl. Russia)**	**Other Industrial***	**China**	**Rest of world****	**Total**
Power	1.3	0.8	0.3	0.7	1.7	1.0	**5.9**
Industrial	0.8	0.6	0.7	0.8	1.5	1.5	**6.0**
Transportation	1.2	0.5	0.1	0.4	0.3	0.4	**2.8**
Buildings	0.8	0.5	0.4	0.5	0.7	0.8	**3.7**
Forestry	0.2	0	0	0	0	6.5	**6.7**
Agriculture	0.2	0.1	0.1	0.1	0.3	0.8	**1.5**
Total	**4.4**	**2.5**	**1.6**	**2.5**	**4.6**	**11.1**	**26.7**

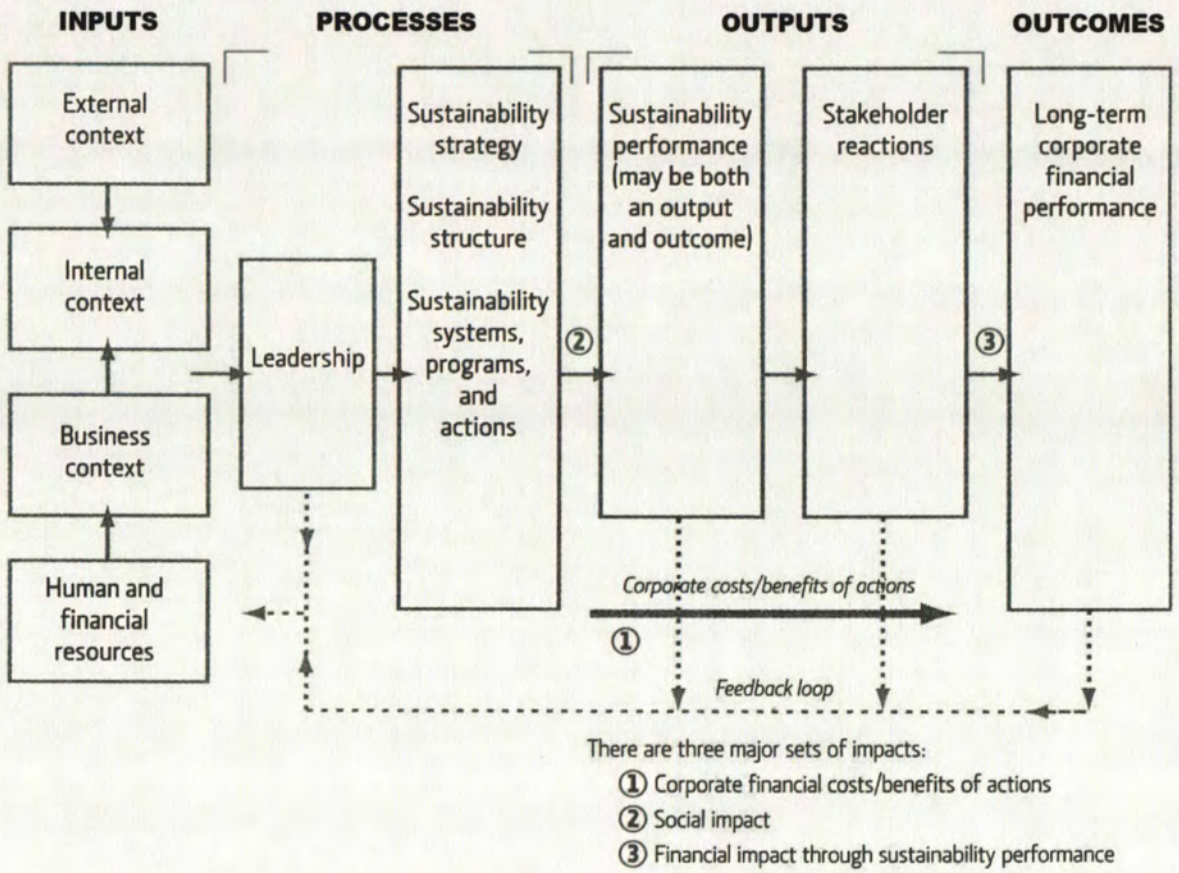
As low cost opportunities are geographically dispersed, a global solution is needed

* Australia, New Zealand, Japan, Singapore, South Korea, Taiwan, UAE, Saudi Arabia, Qatar, Oman, Kuwait, Israel, Bahrain, Mexico

** Africa, South and Central America excl. Mexico, Asia excl. China and countries included in "Other industrialized" (see previous note)

Source: Combat Climate Change, A Roadmap to Combating Change (2007)

Figure 5: Corporate Sustainability Model



Source: Marc J. Epstein, Making Sustainablility Work (2008)

Figure 6: General Business Risks and Opportunities Resulting from Climate Change Impacts

Risks

Inside the fenceline

- Water scarcity, which limits operations
- Impacts to physical assets
- Increased insurance costs
- Supply chain interruptions

Beyond the fenceline

- Unhealthy workforce
- Impacted logistics
- Unstable communities
- Increased regulatory pressure

Beyond the horizon

- Weakened global consumer markets
- Water scarcity, which restricts product use
- Damage to reputation
- Displaced populations

Revenue generating opportunities

Inside the fenceline

- Design of new products and services

Beyond the fenceline

- Expanded markets for products and services

Beyond the horizon

- Expanded markets for products and services

Adapted from Dell, Jan. CH2M HILL. "Business Working on Water: Beyond the Fenceline" presentation at the 2007 World Water Week, Stockholm International Water Institute. 14 August 2007. Dell, Jan. CH2M HILL. "The Role for Business in Managing Water: The Undervalued Resource" presentation at The Conference Board's Business and Sustainability Conference, Washington, D.C. 30 May 2007.

Source: WBCSD, Adaptation - An Issue Brief for Business (2008)

Figure 7: Areas for Business Action on Adaptation

Action to minimize risks

Inside the fenceline

- Redesign to minimize water use
- Redesign for resilience
- Emergency response preparedness
- Supply chain balancing and contingency planning

Beyond the fenceline

- Community emergency response
- Infrastructure planning
- Logistics contingency planning
- Community health plans
- Watershed management

Beyond the horizon

- Support of global health programs
- Improved information systems

Action to leverage opportunities

Inside the fenceline

- Design of new products and services

Beyond the fenceline

- Enter new markets for products and services

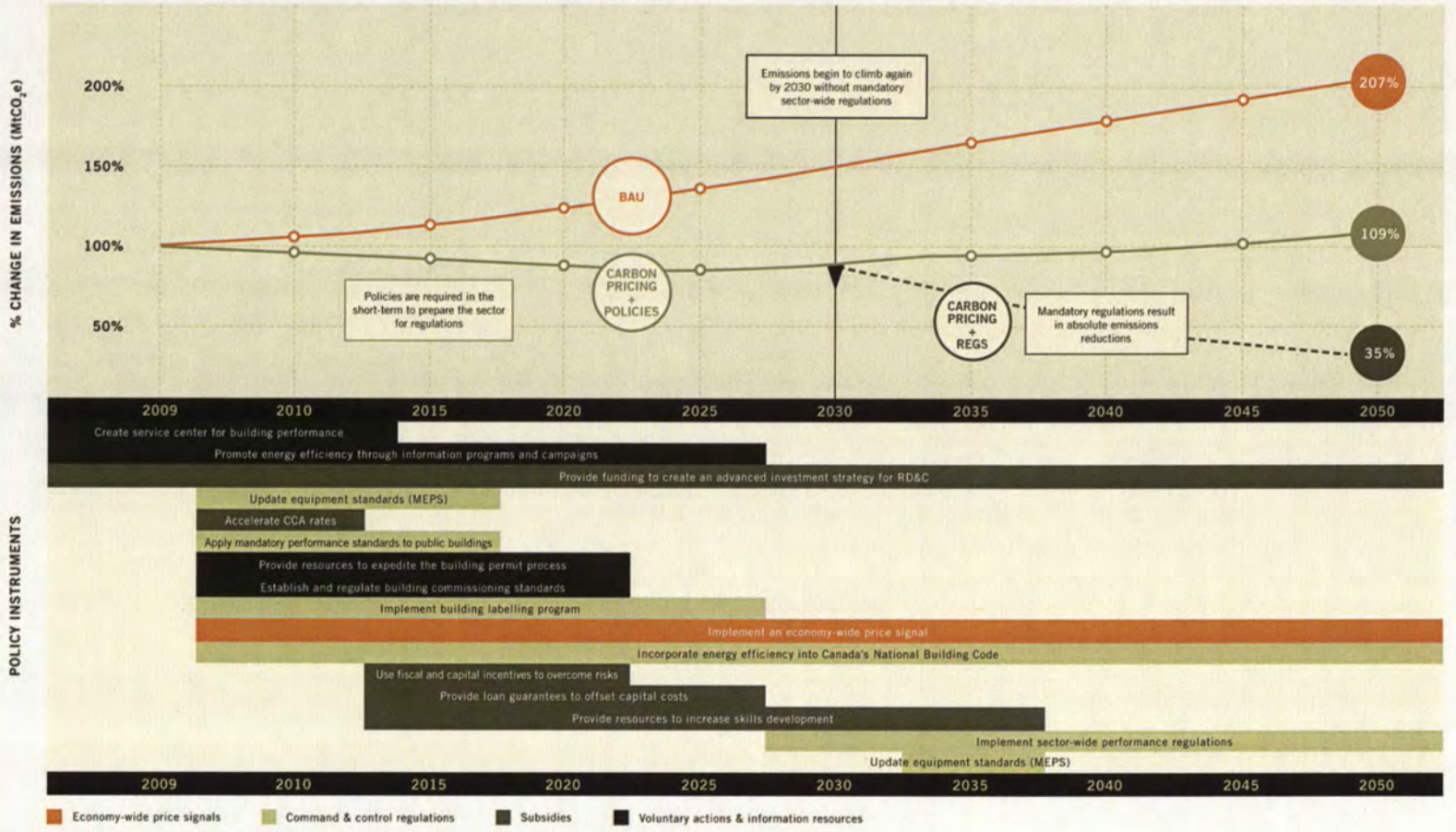
Beyond the horizon

- Enter new markets for products and services

Adapted from Dell, Jan. CH2M HILL. "Business Working on Water: Beyond the Fenceline" presentation at the 2007 World Water Week, Stockholm International Water Institute. 14 August 2007. Dell, Jan. CH2M HILL. "The Role for Business in Managing Water: The Undervalued Resource" presentation at The Conference Board's Business and Sustainability Conference, Washington, D.C. 30 May 2007.

Source: WBCSD, Adaptation - An Issue Brief for Business (2008)

Figure 8: Policy Pathway for GHG Reductions in Commercial Buildings



Source: NRTEE and STDC, Geared for Change (2009)

Figure 9: US Pulp & Paper Companies' Aggregate Financial Exposure to Environmental Issues

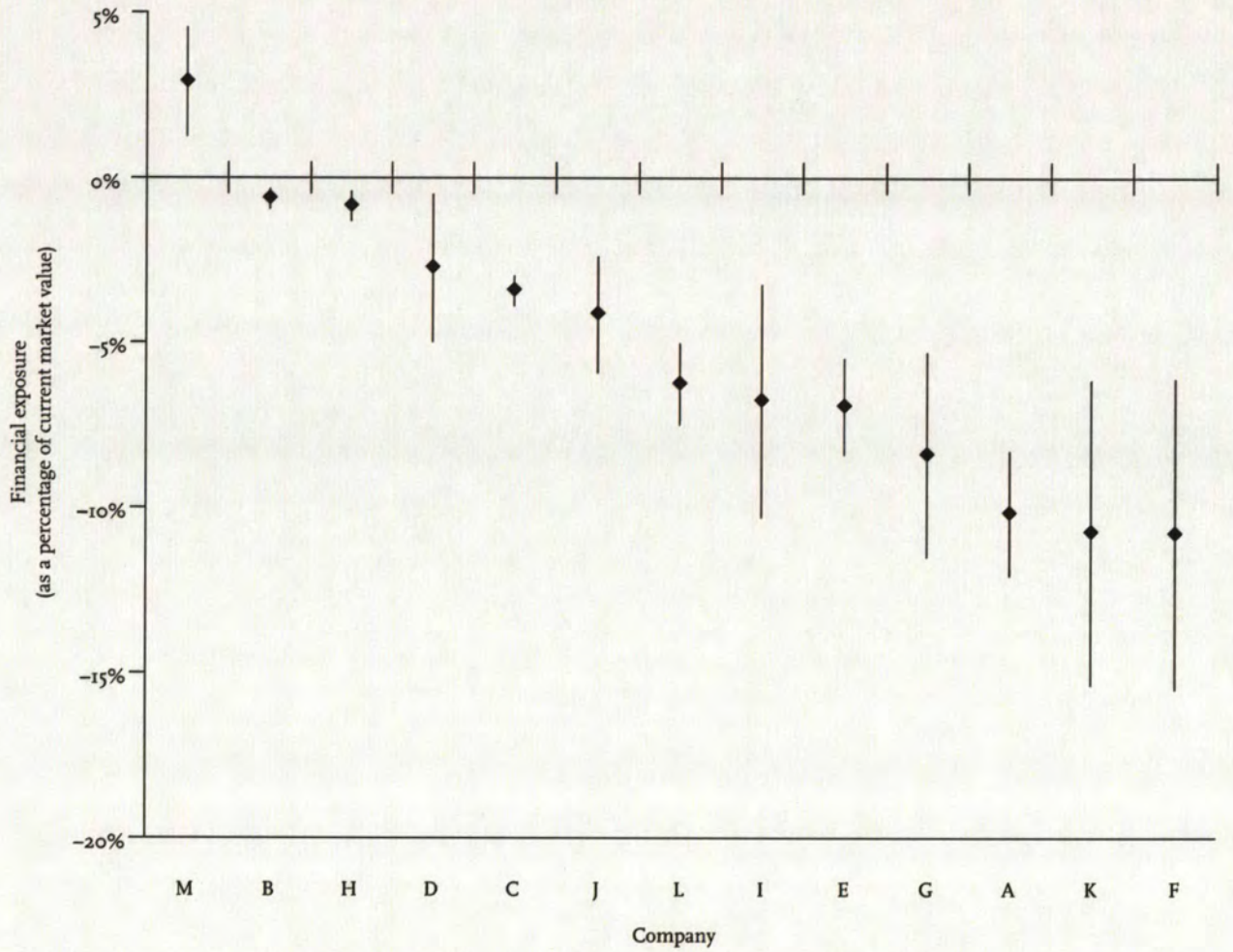


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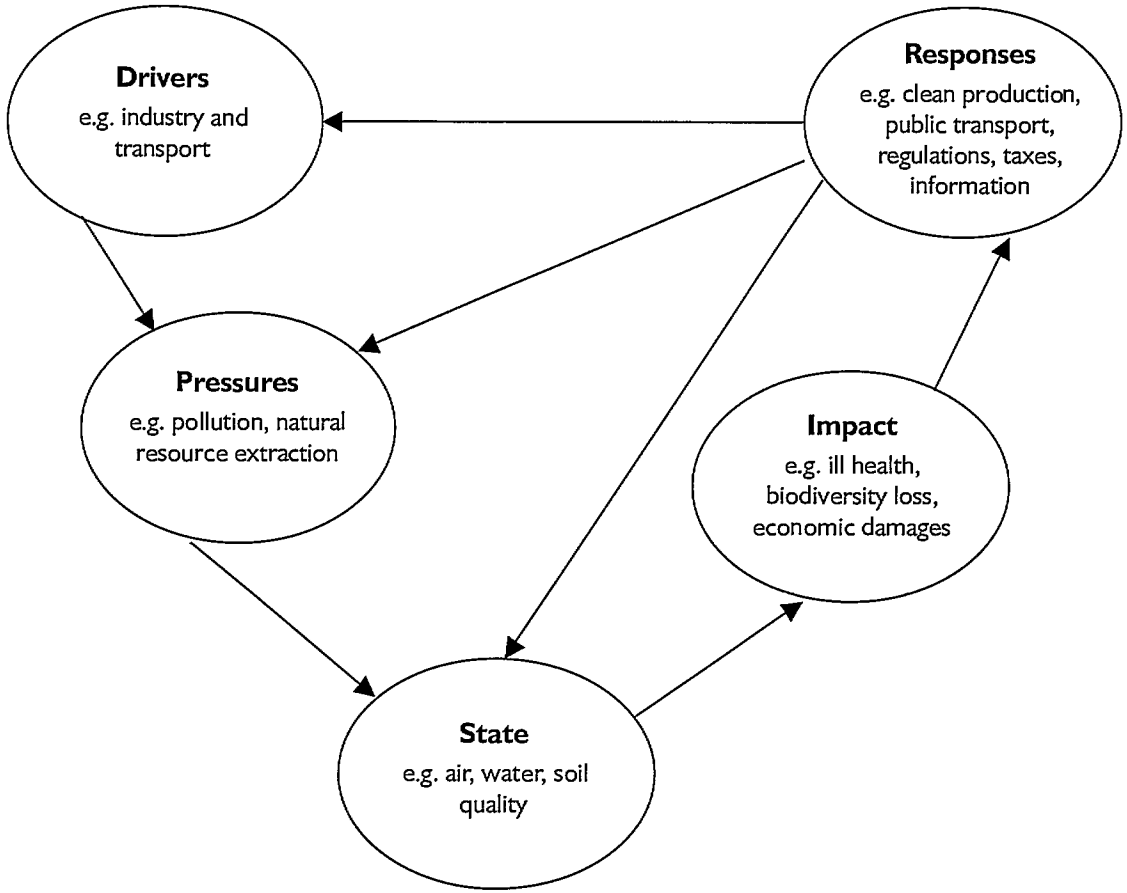
Figure 10: Indicators: The Drivers-Pressures-State-Impact-Responses Framework



Source: Lisa Segnestam, Indicators of Environment and Sustainable Development (2002)

Figure 11: Advantages, Risks and Common Success Factors for Intersectorial partnerships

Advantages

- Access to financial resources.
- Access to (often local) knowledge and expertise.
- Creative, innovative solutions.
- Eco-marketing.
- Legitimacy.

Risks/challenges

- Blurring of tasks and responsibilities.
- Legitimacy loss.
- Cultural differences between parties.
- Insecure outcomes.

Common Success Factors

- Careful choice of subjects.
- Careful choice of goals.
- Careful choice of partners.
- Respectful, open way of working.
- Trust.
- Facilitating factors, e.g. support from the media or politicians.

Source: Mariëtte M. van Huijstee et al., *Environmental Sciences* (2007)