

CHEMICALS AND CORPORATE SOCIAL RESPONSIBILITY: IS THERE A FIT?

by

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ABSTRACT

In this paper, the author develops an argument for the adoption of Corporate Social Responsibility by Canadian Chemical industry firms. The majority of Canadian firms in the chemical industry are members of the Canadian Chemical Producer's Association and a requirement of that membership is the adoption of Responsible Care. Responsible Care is a risk-based initiative that applies to all facets of the chemical business throughout product lifecycles. This paper provides a comparison of Responsible Care and Corporate Social Responsibility as well as a business case for adopting any voluntary initiatives including Responsible Care and Corporate Social Responsibility. A case study of one chemical firm that has adopted both initiatives is included. This paper concludes with observations and recommendations for firms who are contemplating the implementation of a social initiative such as Responsible Care or Corporate Social Responsibility.

DEDICATION

This paper is dedicated to my family, friends and classmates for their understanding, support and encouragement during the last two and a half years. Without the knowledge that you were all there for me, this never could have been achieved and I will be forever grateful. To my manager, John K. Gordon, heartfelt thanks for providing the encouragement that convinced me to do it in the first place.

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1 A DISCUSSION OF VOLUNTARY INITIATIVES

“We are at the very beginning of time for the human race. It is not unreasonable that we grapple with problems. But there are tens of thousands of years in the future. Our responsibility is to do what we can, learn what we can, improve the solutions, and pass them on.” - Richard Feynman

1.1 Introduction

This paper is intended to discuss the issues around and present a case for adoption of Corporate Social Responsibility (CSR) by chemical industry firms. Even though the Canadian chemical industry already has implemented an industry-wide voluntary initiative called Responsible Care, the purpose here is to show how CSR can augment the value derived from it.

In this paper, the term “voluntary initiatives” refers to all programs or initiatives that exceed legislated requirements and include social, environmental, governance and ethics elements along with the financial aspects of organizational endeavour. These programs include but are not restricted to Sustainable Development (SD), Corporate Social Responsibility (CSR), Triple Bottom Line, Social Responsibility (SR), Responsible Care (RC), and Corporate Citizenship. All of these initiatives have common objectives in that they all seek to guide organizations toward a balance between financial success (usually profits) and managing the social and environmental impacts of business activity. For consistency, brevity and clarity, this paper contains a detailed discussion of only two models, Corporate Social Responsibility and Responsible Care. While it is not an exhaustive list, descriptions and origins of some other voluntary initiatives are provided in Appendix 1.

The definition of Corporate Social Responsibility or any of the other initiatives for that matter is a topic of much debate and is likely to result in as many unique definitions as there are debaters. In fact, one of the difficulties that organizations face when deciding to implement a CSR program is being able to move beyond the vagueness of the concept (Hummels, 2004). The Rotman School of Management, AIC Institute for Corporate Citizenship has carried out a study to assemble as many definitions for CSR / SR as possible and as it turns out, there are dozens (Rotman School, 2005). In practice, the first step a firm must take when seeking to implement a voluntary initiative is to craft a unique, relevant and meaningful definition of it for the organization. Only then can the firm develop business processes and systems to support the implementation.

Dialogue about voluntary initiatives undertaken by modern-day corporations is both complex and far-reaching. Often there is little information to be found about a new corporate trend in popular literature until a critical mass of firms has successfully implemented it. Not so for voluntary initiatives like CSR. In this case, while most firms are still contemplating the adoption of CSR, volumes have been said and written about it, both for and against. This huge body of verbiage adds complexity because the myriad of articles of criticism and support, standards, guidelines and case studies must be read, absorbed and analyzed in order to determine if and how the initiative fits a specific organization.

1.2 History of Voluntary Initiatives

Social and environmental concerns related to human activity and business operations are nearly as old as business itself and historically the physical environment and the social concerns have been viewed as two separate problems. In the beginning, however, these concerns were not mainstream issues, but were addressed by activists on the fringe of the business world. These objectors tended to focus on a single issue or industry activity that they personally found

unacceptable and worked to raise awareness or to promote civil disobedience actions among a larger portion of the population in order to effect change. Activism in the social and environmental arena ranges from the development of unions during the industrial revolution, to the suffragists and on to modern non-governmental organizations (NGOs) like Greenpeace.

Environmental impact from the presence of humans was in evidence thousands of years ago when people deliberately used fire to clear agricultural land (this is still a common practice in developing nations). Deforestation and soil erosion were problems for ancient city-states and the Greeks and Romans documented their concerns regarding pollution and occupational health. The industrial revolution brought its own localized impacts on urban centres and mill towns in the form of coal smoke and polluted, dead rivers. As population, urbanization and industrialization grew, so too did the impacts on local communities until these issues became broader, triggering broader geopolitical debate in government and business circles. It was only in the latter half of the 20th century, however, that social and environmental issues commonly grasped global attention. Rachel Carson's book "Silent Spring" (Carson, 1962) for example, brought concerns about environmental matters, specifically the use of the pesticide DDT, to the attention of media and the public. Since then, public awareness of and interest in global environmental issues, particularly those related to the impacts of business and development, has waxed and waned, but has never fully receded from the spotlight.

As was the case for businesses' environmental practices, socially acceptable business behaviour and practices were forced onto enterprises as far back as 1700 BC, when the Babylonian King Hammurabi introduced the first set of organized laws, including a code where builders, innkeepers and farmers were penalized if their negligence caused deaths or inconvenience to citizens (Wikipedia, 2005).

Urbanization, guild-style manufacturing and the development of formal corporate structure in the mid 16th century introduced greater problems, including issues of corporate governance. For example, by the early 1600's the development of powerful companies such as the Dutch East India Company saw shareholders actively complaining about "management secrecy and self-enrichment"(Brass, 2005:1). With the onset of the industrial revolution in the 18th and 19th centuries, huge social, economic and technological changes occurred, resulting in the development of unionism, worker activism, the modern political party system and giving rise to issues of child labour, workers' rights, universal education and unemployment. Yet fighting for these issues continued on a case-by-case and issue-by-issue basis until the 20th century when globalization began to gather strength. It was at this point that shareholder activism became a global social movement (Marens 2002).

Globalization can be characterized as changes in societies worldwide brought about by huge increases in the level and scope of international business and cultural exchanges (Wikipedia, 2005). The globalization of trade that had developed through history, aided by better and faster transport methods, took a brief hiatus during the difficult, unstable political and economic events that occurred between 1910 and 1950. However, in the last half of the 20th century, with the onset of viable commercial air travel, the near-universal penetration of telecommunications methods, and the rise of gargantuan multinational corporations, globalization has escalated exponentially. The world became a true "global village," (McLuhan, 1962) particularly in the last two decades as the Internet and global connectivity have become commonplace. It is this globalization; the shrinking of the world, its impacts and widespread public access to information that married the concepts of social and environmental responsibility and transformed them into global public and corporate concerns.

The realization by corporate leaders that social and environmental impacts of business and development are important for the continued profitability of their firms did not arise overnight and therefore neither did the voluntary initiatives that strive to bring these three business outcomes into balance.

1.3 Origins of Corporate Social Responsibility

How and when did CSR get started? The concept of CSR has been acknowledged by many business leaders for a long time, but the coining of the term and formal writing on social responsibility became commonplace in the 20th century, especially during the last half century. (Carroll, 1999) In addition, the concept of stakeholders has been used since at least 1989 to describe corporate interest groups other than shareholders (Tepper Marlin, 2003). Historically, corporate executives, or “businessmen” as they were referred to in the first 70 years of the 20th century, since there were almost no women openly active in business (Carroll, 1999), who had social or environmental values and interests had always lead the way by managing those issues proactively within their businesses. Carroll contends that the writing of Howard Bowen (1953) in his book “Social Responsibilities of the Businessman” first articulated the concept that vital centres of power and decision making resided with several hundred of the worlds’ largest businesses and that the actions of these firms affected the lives of citizens throughout the world (Carroll, 1999).

Throughout the 60’s and 70’s, this idea expanded to include the notion that the thinking and actions of business leaders should encompass drivers over and above the firm’s economic or technical ones (Davis, 1960). In all of their writings, the social and environmental thought leaders were attempting to dispel the notion that the chief and almost only responsibility of a firm

was to provide returns to shareholders. They also grappled with the basic dilemma of where the dividing line was between social and environmental responsibilities of society (governments and the public) and of corporate entities.

Authors such as Rama Krishnan were conducting surveys to establish the state of business philosophy and the attitudes of business executives regarding their responsibilities to owners, employees, customers and other stakeholders. The results of Krishnan's work showed that as early as 1973 in the United States, few firms were convinced that stakeholder responsibility was necessary. He stated, "The present day American business system has evolved over many years from the earliest craftsman-trader to the present giant multi-national corporation. Much has not changed however, in the values and philosophy of business executives. The majority of the executives still believe in the profit maximization philosophy and the absoluteness of the prerogatives of management in operating the business organization, as they perceive it" (Krishnan, 1973: 668). The main trend noted from the study is that, although executives in general do not see evidence of changes in the attitude of managers in organizations towards exercising responsibility to groups other than stockholders, more executives as individuals believe that business should become more responsible to other groups. It must be pointed out here that even the formalization of thinking about CSR developed regionally, because European firms were very early adopters of voluntary initiatives when compared with North American ones.

By the late 1970s and early '80s, public CSR reporting began. In its first stage of development, CSR reporting consisted of advertisements and short information sections about environmental matters in annual reports; but neither of these was linked to performance metrics. By the second stage in the late '80's, early leaders in CSR such as Shell, The Body Shop (later discredited) and Ben and Jerry's had evolved the reporting process to include social and environmental performance, using corporately-established metrics and confirmation of their performance using

external audits. The third stage, occurring in the mid 1990s encompassed the use of generally accepted standards (either industry-wide or global) of performance, development of third-party CSR auditor accreditation and the notion of continual improvement (Tepper Marlin, 2003).

Today, well-known firms such as BP, Shell and Suncor have fully embraced CSR. Others, big and small, have implemented management systems which enable CSR but have not formalized them in policy and procedure, while many other corporations have yet to acknowledge the impact CSR has in the current global business milieu. However, during the last decade the rate at which CSR and other voluntary initiatives have been adopted by businesses is increasing.

Why has this occurred, and why now? Over the last decade, researchers and business analysts have produced a growing body of studies that establishes a positive correlation between superior business performance and strong commitment to and good performance in environmental and social aspects of their operations (Roman, Hayibor, Agle, 1999; Verschoor, 2003). While some bodies, such as the Canadian Institute of Chartered Accountants (CICA) have yet to acknowledge that there is “persuasive evidence” of this correlation, (CICA, 2004) many other organizations and firms have been sufficiently convinced of this positive effect. In the same period, public demand for corporate accountability and transparency, coupled with the growing incidence of shareholder activism, have forced most public corporations to change their thinking about social, environmental and ethical (SEE) issues. These corporations are the early adopters of CSR and similar initiatives.

1.4 Origins of Responsible Care

Responsible Care was developed by the Canadian Chemical Producers’ Association (CCPA) and formally adopted in 1985 as an industry initiative that embodies a new ethic toward the safe and

environmentally sound management of chemicals throughout their life cycle. Established in 1962, the CCPA is the national trade association of Canadian chemical manufacturers which currently represents over 65 member companies and Responsible Care Partners, ranging in size from 50 to 5,000 employees. CCPA members account for more than 90 per cent of basic chemical and resin manufacturing operations in Canada (CCPA, 2005).

Responsible Care has a global application to the chemical industry and has spread to over 47 countries through its adoption by other chemical industry associations. Responsible Care has a single industrial sector focus, is trademarked, and has a very specific set of requirements and accountability agreements. In light of this, it differs greatly from the broad informal trend, wide scope and multi-sector adaptability of CSR. While RC and CSR share a common thread, which is the ethic of doing the right thing, their different origins have resulted in divergent focal points and diverse methods for implementation.

One of the founders of Responsible Care, Arthur O'Connor, wrote that Responsible Care was not originally viewed as a global chemical industry initiative. Its' success is the result of an evolutionary process that began with the development and adoption of Responsible Care by the Canadian chemical industry in the 1980s. This move required vision and courage on the part of the Canadian firms and their leadership and certainly required most of them to move far beyond their comfort zone with respect to openness and community involvement. O'Connor goes on to say that Responsible Care "was conceived as a domestic answer to a domestic problem and has evolved into a highly respected process that is changing the culture of an entire industry" (O'Connor, 1998: 1). Responsible Care's continuous improvement requirement implies that the implementation process is a perpetual journey which does not have an end state. O'Connor acknowledges this by saying that the evolution of RC has not ended and thinking so fails to understand the underlying strength of the ethic itself (O'Connor, 1998).

The chemical industry in Canada has a long and varied history, starting with the manufacturing of explosives for railroad construction in the late 19th century. This industry also provided explosives and munitions for both World Wars and then began to branch out into synthetic chemicals that have now become ubiquitous in modern-day life. In 1942, Kingston, Ontario became home to DuPont's nylon plant, the world's second, while the production of cellulose cellophane film had already been under way for 10 years in Shawinigan, Quebec (DuPont Canada, 2005).

In the 1970s the Canadian chemical and chemical products industry made a substantial contribution to the national economy, increasing its production at 5.4 percent annually compared to 3.0 percent for total national manufacturing. (Only telecommunications and computers were higher). The pace of growth slowed in the 1980s, averaging less than 5 percent per annum. Canadian chemical growth exceeded the growth of Canadian total manufacturing and US chemical output on average throughout the 1980s. By 1992, the industry had grown to the point where the value of shipments for chemicals and chemical products amounted to \$21.5 billion, or 7.5 percent of all shipments of manufactured goods. The industry ranked third among Canadian manufacturing sectors (CCPA 1994).

The major drivers for the development of RC in Canada began with a subtle mix of government and public concern about the health effects and safety of chemicals. By 1978, the CCPA had drafted and accepted a set of guiding principles for the management of chemicals and for a time, that seemed to be enough. Member companies were expected to signal their acceptance of these principles, but only about a third actually did. However, for the time, that seemed to be enough. By 1983, government pressure increased with respect to the need for regulatory intervention if the industry did not voluntarily make substantial improvements with respect to environmental, health

and safety performance obligations. CCPA member companies began formally adopting the guiding principles and the concept of Responsible Care was born. The CCPA had already been quietly and slowly taking action to enable the guiding principles when the situation suddenly came to a boil in the aftermath of a chemical incident that had consequences of unprecedented severity in Bhopal. On December 3, 1984, methyl isocyanate (MIC) gas leaked from a tank at the Union Carbide plant at Bhopal, India. This leak caused approximately 3,800 people to die and several thousand other individuals to experience permanent and partial disabilities. For more information about the Bhopal incident, visit the website www.bhopal.com. The frightening part for everyone was that it involved a respected North American chemical company known for its good safety and environmental systems – could this happen in Canada?

The adverse public reaction and outcry about the impacts of chemical industry accidents and historical behaviours was escalating, and with good reason. Chemical industry accidents, spills and releases such as those identified in Appendix 2 were affecting people and the environment, and with increasing global news coverage, people were fast becoming more concerned and even militant about chemical plants in their neighbourhood. Even worse, in Canada, the impacts from current activities and historical behaviours of some chemical industry players had resulted in highly publicized environmental and health issues such as the mercury contamination of the English-Wabigoon River system by a Dryden, Ontario pulp mill in the 1970s or the 1985 St. Clair River “blob” thought to originate from the nearby “chemical valley” in Sarnia, Ontario. The resulting public, governmental and internal pressures and the negative impacts on chemical industry acceptance were confirmed by the results of a 1986 CCPA-commissioned survey done by Decima Research that showed the attitude of the public toward the chemical industry was at an all-time low. The opening lines of the report stated that the results of the survey found the Canadian chemical industry facing public attitudes that were more challenging and difficult than any Decima had ever measured relative to other industries (Decima, 1986). The report went on to

state that the level of risk that the public attributed to the chemical industry was second only to the nuclear power industry. It is very telling that the field research for the Decima report took place a month after Chernobyl.

CCPA realized that if the Canadian public's view of its industry had sunk as low as that of the nuclear power industry, then the days of having a license to build and operate new chemical plants here could soon be numbered. As chemicals do a great deal of good in the world and provide the Canadian economy with a large portion of its revenue, the CCPA and its member companies were prepared to fight against the negative attitudes and redeem the industry's reputation.

The CCPA Responsible Care development process moved forward between 1985 and 1988 as follows:

- Agreement was reached by the CCPA Board of Directors that all members must take uniform action.
- A declaration was made that required all members to formally commit to the guiding principles.
- Two task forces were struck to develop a safety audit process and a recommended action plan to implement the guiding principle elements.
- Community Awareness and Emergency Response (CAER) programs were formally activated.
- Reporting of results of safety audits to CCPA began.
- The National Advisory Panel was formed and held its first meeting.
- CCPA began sharing its work with Federal and Provincial governments.
- The Codes of Practice were developed.
- Responsible Care Leadership Group process began.

Once developed, Responsible Care Code requirements were implemented at member companies between 1988 and the first half of the 1990s. Progress toward implementation was monitored through self-assessments submitted quarterly to CCPA. Companies who were leaders assisted those who struggled as the process marched onward. By the early '90s however, it was clear to CCPA through member company observation and National Advisory Panel feedback, that the self-assessment process was not fulfilling the public desire for corporate credibility and transparency. By 1994 a verification process was developed, whereby an independent group of individuals appointed by the CCPA would visit each member company to determine if it was in fact compliant with the ethic and practice of Responsible Care. Originally intended to be a "one-off" event, the information sharing involved in the process provided such value and the industry ownership and operational structures were so fluid, that the process is now repeated on a three-yearly cycle.

Responsible Care continues to develop and change according to international societal requirements and industry conditions. Arthur O'Connor contends that Responsible Care was never intended to be an international movement however it somehow happened to become one. He cautions that the extension of Responsible Care to nearly fifty countries presents challenges in maintaining the integrity of the initiative and predicts that the test of its efficacy and integrity will be its success in delivering measurable improvements in safety, health and the environment. Effective communication of these results to stakeholders and gaining public approbation of industry efforts will also measure its ultimate success (O'Connor, 1998).

2 THE BASIC CHEMICALS INDUSTRY IN CANADA

“It is not only for what we do that we are held responsible, but also for what we do not do.”

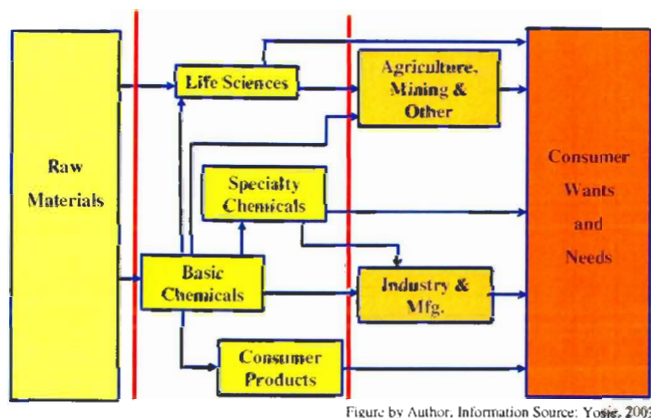
Jean Baptiste Poquelin Molière.

2.1 The Chemical Industry as a Whole

The chemical industry is the engine that transforms raw materials into countless consumer products that make modern day life easier, safer and healthier. Whether one realizes it or not, everyone uses chemicals as part of their everyday activities from farming to mining, cooking to producing images on paper.

Raw materials for chemicals consist of oil, natural gas, coal, and inorganic compounds that are mined, or sourced from other naturally occurring materials, like salt, for example. Many of the basic and specialty chemicals in commerce have been in use for over 100 years while chemicals

Figure 1 – Overview of the Chemical Industry



destined for the life sciences markets are generally newer and synthesized for very specific purposes. For example, in the pharmaceuticals sector, the lines are being blurred between chemicals manufactured naturally by living organisms and those produced in the laboratories and

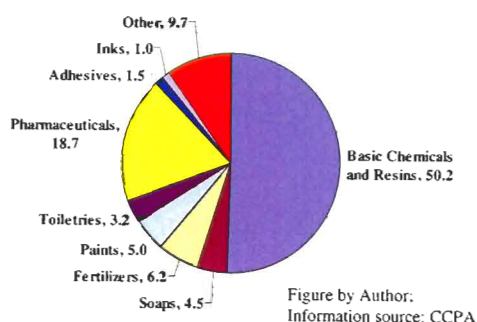
factories. Figure 1 shows an overview of the industry from raw materials through to the

production of goods that fulfil consumer needs. The basic chemicals industry placement is directly downstream from raw materials.

2.2 Chemical Industry Input to the Canadian Economy

The chemical industry is vital to the health of the Canadian economy, bringing sales revenues totalling more than \$40 billion in 2002. Figure 2 shows data from 2002, broken down by the value of each chemical product stream as a percentage of the total value. The industry employs

Figure 2 – Chemical Manufacturing in Canada by Product Stream



large numbers of highly skilled workers and is a significant contributor to the Canadian GDP. In 2004, chemical manufacturing (NAICS 325) represented 1.7 percent of all Canadian GDP and 9.7 percent of all manufacturing GDP. In addition, the growth rate in chemicals was 4.6 percent from 1997 to 2004, which exceeded both

the manufacturing (3.5 percent) and the overall Canadian rates (3.6 percent). (Statistics Canada, 2005). While the Canadian economy depends on the chemical industry for health, the chemical industry relies on other (world, US) economies for its success. For example, in 2004 it was strong demands in Canadian, the US and offshore markets that lead to basic chemical sales increases over 2003 figures.

For the purposes of this report, CCPA member companies are considered to fairly represent the basic chemicals and resins manufacturing industry in Canada and will henceforth be referred to as “the chemical industry.” This sector is most closely approximated by the North American Industry Classification System (NAICS) codes 3251, basic chemicals; and 3252, resins, synthetic

rubber and fibres and as shown in Figure 2, comprise more than 50 percent of the product value of sales in 2002.

The Canadian Chemical Producers' Association (CCPA) is the national trade association of Canadian chemical manufacturers. The association creates value for its members and partners by assisting in Responsible Care implementation and by fostering a favourable business climate for the chemical industry in Canada. The association represents the interests of more than 65 member-companies, ranging in size from 50 to 5,000 employees. With more than 200 manufacturing and distribution facilities across the country, CCPA member companies manufacture over 90 percent of the chemicals produced in Canada. (CCPA, 2005)

The 3251/3252 chemicals industry as part of the overall chemical industry is also critical to the Canadian economy. In recent years, it has consistently ranked among the top three industrial manufacturing sectors in Canada, directly employing more than 25,000 people and contributing an additional 300,000 jobs. Many of the products in this industry and certainly all of the petrochemicals and inorganic chemicals are commodities, which means they are sold according to specifications, and that manufacturing organizations depend on low production costs to attain reasonable profit margins. The majority of Canada's chemical industry is concentrated in three

Figure 3 – Canadian Chemical Shipments 1992 and 2002

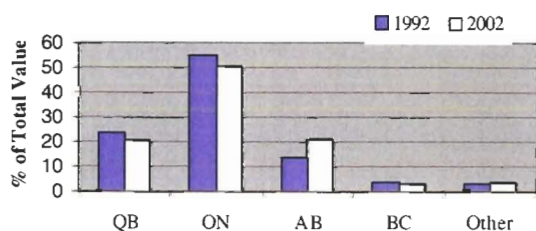


Figure by author; Information source: CCPA

provinces; Ontario, primarily in or near Sarnia, which has the oldest establishments and the largest group of facilities; Quebec, mainly in and near Montreal; and Alberta, where much of the newer capacity is located. A breakdown by province of chemical product shipments

from Canadian plants in 1992 and 2002 as a percentage of total value, shows that despite the growth of the industry in Alberta, the overall dominance still remains in Ontario (Figure 3).

The industry has three main sectors: petrochemicals, organic and specialty chemicals, and inorganic chemicals. Fertilizers, based on ammonia derived from natural gas, are sometimes included in the petrochemical category.

2.2.1 Petrochemicals

Petrochemicals are produced using petroleum or natural gas-based feedstocks. The most important feedstocks required for petrochemical production are natural gas, natural gas liquids (NGLs), naphtha, gas oil and refinery gases. The last four products come from crude oil and natural gas. Crude oil is processed into naphtha, gas oil and refinery gas streams, while NGLs (ethane, propane, butane) are separated from natural gas.

Petrochemicals are manufactured from these feedstocks using various processes utilizing heat,

Table 1 - Petrochemical production in Canada

Product Aggregate Data	Total tonnes (000s)
Linear Alkyl Benzene (LAB)	120
Polystyrene	181
Polyethylene Terephthalate (PET)	195
Alpha Olefins	250
Ethylene Oxide (EO)	285
Polypropylene (PP)	375
Vinyl Chloride Monomer (VCM)	500
Purified Terephthalic Acid (PTA)	540
Polyvinyl Chloride (PVC)	708
Styrene	880
Propylene	912
Ethylene Dichloride (EDC)	1080
Methanol	1350
Ethylene Glycol (EG)	1510
Benzene, Toluene, Xylene (mixed and pure isomers)	2614
HDPE / LLDPE / EVA	3714
Ethylene	5207

Table by author; Information source: CCPA

pressure and catalysis to achieve the yields of desired end products. Often, one end product from a process becomes the feed for another. Finally, petrochemicals are typically are converted into articles for industrial or consumer use through physical operations such as moulding (plastics), spinning (synthetic fibres), or mixing and/or blending (windshield washer

antifreeze). End uses include a range of products such as paints and coatings, adhesives, plastics,

coolants, cosmetics, rubber goods, detergents, and fibres which are used in a multitude of downstream industrial sectors including forestry, mining, textiles, construction, transportation agriculture and even pharmaceuticals (to make acetylsalicylic acid (ASA)). Table 1 shows the petrochemicals currently being produced in Canada in quantities greater than 100,000 tonnes per year. Other petrochemicals produced in lesser quantities include acrylic latex, alpha olefins, styrene butadiene latex, C4 mixtures, mixtures of aromatic compounds, poly-trimethylene terephthalate, and isopropyl alcohol.

2.2.2 Organic and Specialty Chemicals

Organic and specialty chemicals are products that may be created from either animal fats and vegetable oils or from crude oil and natural gas. They are commonly used in the manufacture of consumer products, as intermediates to produce other chemicals, or as essential additives and process chemicals in basic industries as mining, oil and gas, and pulp and paper. Examples of some organic and specialty chemicals that are produced in Canada include glycerin, detergents, plasticizers and rubber.

These products are higher value-added than commodity petrochemicals and have higher selling prices, but they are made and used in much smaller volumes and are normally sold on the basis of performance rather than specification. These chemicals can have a substantial impact on product innovation and/or competitiveness through their influence on the quality and performance of products and processes. Even though organic and specialty chemicals may constitute a small part of the cost of finished and semi-finished manufactured goods, it is critical for many industries' ongoing operations to have a secure source of supply.

Canadian demand for organic and specialty chemicals has increased approximately in line with the growth of the economy over the past decade, however, because of the small domestic market, small-scale batch production predominates. Batch manufacturing results in high unit costs for labour and downtime to accommodate changes from one production run to another. Since it is not economically viable for Canadian producers to make many of these small volume specialized chemicals, much of the domestic demand has been met by imports.

2.2.3 Inorganic Chemicals

Canada produces more than 50 commodity inorganic chemicals which are essential to virtually all major manufacturing processes and industries. The most common of these chemicals include sulfuric acid, sodium carbonate (soda ash), sodium hydroxide (caustic soda), chlorine, phosphorus and titanium dioxide. In Canada, sulfuric acid is made either from burning elemental sulfur which is recovered through natural gas “sweetening” or from smelting “off gases”. Sodium carbonate is produced using reactions between salt, ammonia, lime and carbon dioxide. Phosphorus is extracted from phosphate rock using silica, coke and electricity. Electrolysis of salt and water produces chlorine and sodium hydroxide, whereas titanium dioxide is produced from a reaction between ilmenite ore and sulfuric acid.

Inorganic chemical demand has increased in the last decade, however Canada produces sufficient quantities to be a net exporter. Inorganic chemical production is capital intensive, utilizing complex technologies and automated processes. Producers tend to locate plants close to either raw material sources or large industrial consumers.

2.2.4 Chemical Industry Strategic Issues and Drivers

The chemical industry in Canada is subject to a unique set of drivers and issues that result in profitability, growth and market share performance in the chemicals business. Figure 4 provides an overview of those most critical to the industry.

Figure 4 – Chemical Industry Drivers

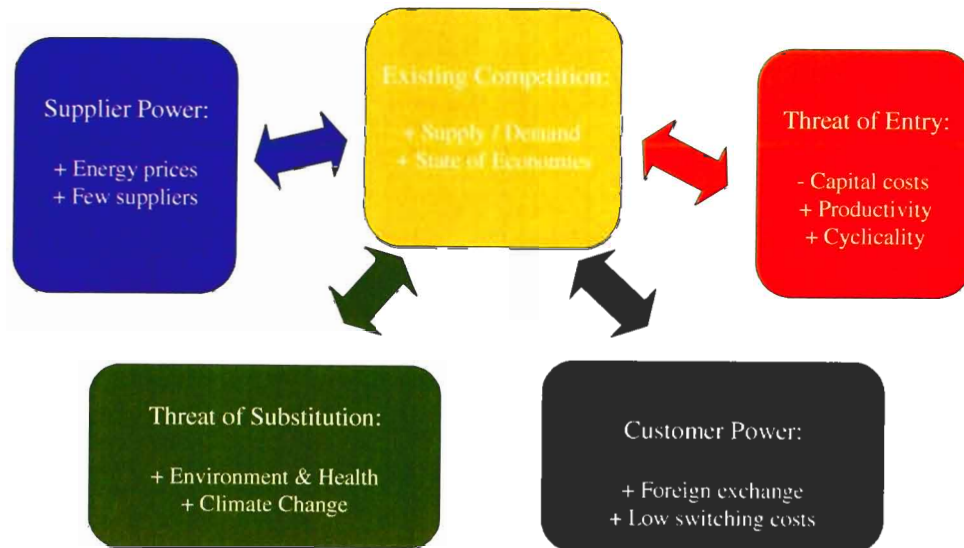


Figure by author; Information source: Porter, 1979

2.2.4.1 Existing Competition:

Supply / Demand Balance One of the chief determinants of competition and performance in the chemicals industry is supply/demand balance. Closely connected with economic conditions, this driver derives its importance from the fact that the chemicals business is mature, and growth in demand results from economic growth, rather than an expanding market. Actual market growth may be found for some biotech or new specialty chemicals, but for the most part, the basic chemicals and resins markets are long-established. While new uses for these products are being sought every day, such as the fuels and fuel cell markets for methanol, these have yet to be firmly established. Because of this, few new production facilities are being planned or built in Canada although many of the existing ones have been de-bottlenecked or modernized. This means that

Canadian supplies will be relatively fixed and prices fairly inelastic. The utilization of Canadian chemical capacity in 2004 averaged 90 percent (which is at or near the practical capacity) resulting in a profit ratio (operating profits to operating revenues) for chemicals of 9 percent. Because of increased chemical demand, plants were running at close to capacity. With few new competing chemical supply sources to meet demand, Canadian producers were able to pass on more of their increased costs than in previous recoveries. In fact, despite high capacity utilization rates supply shortages for chemicals forced some producers to allocate their output to key customers. Since world-scale plants for many products have nameplate capacities of a thousand or more tonnes per day, a small number of new plants could easily produce an oversupply and falling prices. (CCPA, 2005)

State of the Economy A Conference Board of Canada (CBOC) report discusses Canada as a trading nation with a small domestic economy, whose prosperity is linked to world events and dynamics. Factors such as the American current account deficit, the rise of China and India as economic powers, the offshore manufacturing phenomenon, and a “thicker” Canada – US border since September 11, 2001, have impacted the future, including the environment for international economic relations (CBOC, 2004). Certainly Canada and the US are more closely linked economically than any other two nations in the world. This is demonstrated by the fact that 83 percent of all Canadian exports go into the US market. (Hodgson, 2005)

The result is that the Canadian chemical industry is affected by the state of both the Canadian and US economies, which are in turn affected by world events. Canadian economic prospects, and with it the chemical industry’s future performance will be a story of two economies – weakness in the export-led economy, but a brighter scenario on the domestic side. Strong domestic fundamentals will help carry the Canadian economy through a bumpy period of global realignment and weaker export growth (Hodgson, 2005). This “bumpy period” is brought on by

many factors including the devaluation of the US dollar against other currencies (bringing with it a stronger Canadian dollar), a moderation in world demand and most importantly, a strengthening of China's penetration of historically Canadian market shares in the US. Meanwhile, Canada's domestic economy remains bright because of strong economic fundamentals, strong domestic investments, and solid employment and disposable income growth.

2.2.4.2 Threat of entry:

Productivity While most industrial sectors in Canada lag the US in productivity, the chemical industry is one of the few bright lights. In 1999 labour productivity was just 86 percent of US levels but by 2002 the productivity gap had disappeared and Canadian productivity exceeded that of the chemical sector in the US - quite a phenomenal performance. Many factors may have caused this growth in productivity, and one of them may be that Canadian chemical firms have increased the rate of research and development (R&D) spending faster than in the US. This is significant as innovation and productivity are closely linked with R&D spending. This positive productivity factor may tend to increase the threat of new entrants into the chemicals sector, thus increasing competition. (COBC, 2004)

Capital costs Because of the need to build manufacturing plants utilizing high pressure, high temperature conditions and specialized purpose-built process equipment, the chemical business is capital intensive. Capital investment is defined as "gross expenditures on fixed assets for use in the operation of an establishment or for lease or rent to others. It includes: cost of all new buildings, engineering and machinery and equipment (which normally have a life of more than 1 year) and are charged to fixed assets accounts. It also includes modifications, additions and major renovations; capital costs such as feasibility studies and architectural, legal, installation or engineering fees; subsidies; capitalized interest charges on loans with which capital projects are

financed; work done by an establishment's own labour force; and additions to work in progress.

Table 2 - Accumulated Capital Investment by Asset Type

NAICS 3251			
Asset Type	Value in billions		CAGR
	1994	2003	1994-2003
Machinery and Equipment	11.2	9	-2.4
Construction	7.7	7.6	-0.1
Total	18.9	16.6	-1.7
CAGR = Compound Annual Growth Rate			

Table by author; Information source: CCPA

Assets acquired for lease to others are included, but assets acquired as a lessee are not" (Statistics Canada, 2005).

Table 2 shows Canadian capital investment values over the period of 1994 to 2003. This aspect of the

business tends to discourage new entrants, even when, as today, plants are running at near-capacity and prices of commodity chemicals are high.

Cyclicality The commodity industry is plagued by peaks and troughs in prices, as driven by supply / demand dynamics and economic factors. Prices are highly influenced by market demand,

Figure 5 - Short Term Cyclicality in the Chemical Industry

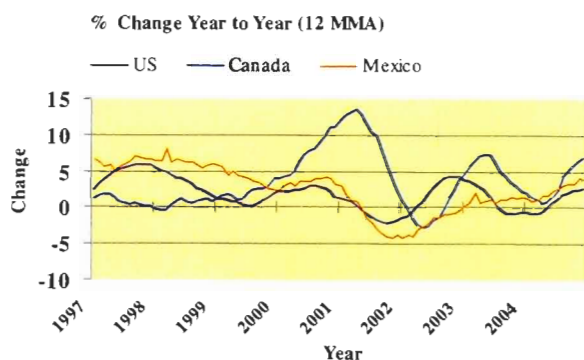


Figure by author; Information source: Swift, 2005

which in turn is driven by other manufacturing industries. Figure 5 (Swift, 2004) shows short-term cyclicality in the chemical industry for North America, using 12-month moving averages (to smooth seasonal variations). Using methanol as an example, historic prices have ranged

from under US \$115 per tonne in the trough of the cycle (1998/99) to highs of US \$300-plus per tonne at the peak. (Methanex Annual Report, 2004). The design and construction of a world-scale chemical plant requires 18 to 24 months, so mistakes in the timing of bringing on new capacity are easily made. Cyclicality can therefore affect entry. When prices and demand are high, the industry looks more attractive to new entrants, but by the time the new plant is built, the cycle is in downturn and the newly commissioned plant just adds unneeded capacity, thus driving

prices lower. Historically this often occurred because there was no one market leader to act as a stabilizing force.

2.2.4.3 Customer Power:

Foreign Exchange The increased strength of the Canada-US exchange rate makes Canadian-manufactured chemicals more expensive and is having a negative effect on exports which is especially bad for the specialty chemicals producers that rely on exports for their existence. The rising dollar may be thought of as a stimulus for productivity, however as the chemical industry is already a productivity leader in North America, it has little more to gain.

Low switching costs The chemicals industry with the exception of the specialty and organics sector is largely an industry of commodity products, therefore cost of production and price are the major determinants of profitability. The vulnerability in commodities is the threat of new lower-cost sources of supply entering the market. Customers purchase commodities on specification and, if a new cheaper supply that meets the required specification is available, then switching suppliers presents little to no cost to the purchaser. Most companies in the commodity sector attempt to enter into long-term supply contracts with customers to reduce the risk of losing sales due to supply switching. In an earlier discussion about the lack of differentiation of chemicals it was perceived that this factor increased the threat of entry to the industry. Lack of differentiation also increases the bargaining power of methanol customers since they can choose any supplier, with little regard for issues related to grades or specifications. Customers can purchase on the basis of price alone, or a combination of price, security of supply, supplier relationship and service or other perceived value-added variables. In this case the buyer can exercise purchase preferences independent of the actual product quality. Co-mingling or substitution of methanol from different sources introduces no risk, so this can be done by the purchaser at will.

2.2.4.4 Threat of Substitution

Environment & Health Chemicals in commerce, both new and old, are under increasingly rigorous scrutiny with respect to their potential acute and chronic effects on population and environmental health. Basic chemicals and resins are no exception. New chemicals automatically undergo screening and testing to determine their acceptance for general use. Older chemicals in commerce, like ethylene glycol, methanol, ethylene dichloride and BTX or their downstream derivatives are being subjected to requirements such as those under the North American “High Production Volume” (HPV) chemicals initiative. This process requires reviews of existing sets of data on the physical, chemical and toxicological characteristics of products. If data sets are found to be incomplete, individual companies or consortiums of companies are required to conduct basic research to fill the gaps to keep the product in the market. In addition, research on the health and environmental effects of chemicals is being conducted all the time, and the results of this research could reveal previously unknown information that may impact market acceptability of the product. Erosion of public and customer acceptance drives three responses: increasing levels of regulatory intervention in the form of exposure, handling, and packaging requirements; de-selection of the product as the “first choice” in favour of another more “friendly” product; or outright bans on production and use. An example of a basic chemical derivative threatened in this way is the case of formaldehyde.

In the last 12 months, the International Agency for Research on Cancer (IARC) reclassified formaldehyde and changed its category from a “probable carcinogen” to a “known carcinogen” based on a linkage of the chemical to the incidence of nasopharyngeal cancer. This reclassification will trigger activity in standards-setting organizations such as the US Occupational Safety and Health Administration (OSHA) to tighten exposure, packaging and transportation requirements. This may, and likely will, affect the overall consumption of formaldehyde, a key derivative chemical used in countless consumer products.

Another threat to the chemical industry is the international Kyoto Accord for managing climate change. Its implementation continues to be a concern for all chemical producers who use energy and emit significant quantities of greenhouse gases (GHGs), usually in the form of carbon dioxide. Currently there is considerable uncertainty in Canada about how the government will meet its commitment targets while maintaining its international competitiveness. The federal government has not developed robust and coherent climate change policies or action plans and seems to be taking an approach that ignores past investments by the chemical industry and penalizes it for good performance in reducing its emissions.

2.2.4.5 Supplier Power

Energy Prices World crude oil prices rose to over US \$50 per barrel in September 2004, and, while the price did not reach the lofty \$90 (in 2005 dollars) levels of the early 1980's, the situation appears to be more permanent as prices have remained at or above the \$46-48US range for the first six months of 2005. North American consumer and industrial markets are competing for this source of energy, driving up pricing and giving petroleum suppliers power over industrial consumers. Canadian chemical companies face considerable cost pressures whenever prices of raw materials and energy are as high as they are today.

Energy consumption accounts for approximately 10 percent of the total production cost of chemical manufacturing (particularly petrochemicals) however in some processes this value can rise to 80 percent, therefore, the energy market is a dominating factor in determining plant profitability. Natural Resources Canada indicates that in 2001, the total energy consumption in the petrochemical sector was about 36 petajoules (PJ) and states "that natural gas is the main energy source, as it supplies 70 percent of total energy requirements." (Natural Resources Canada, 2005)

Natural gas, unlike crude oil, is mostly a regionally-traded commodity because of the cost and

Figure 6 – Natural Gas Price History – US Gulf Coast

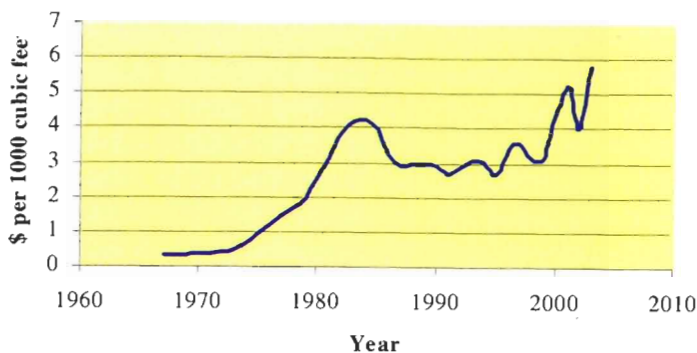


Figure by author; Information source: US DoE

infrastructure required to transport large quantities. Escalating oil prices and growing demand for energy in most markets (particularly in the US) has caused the price of natural gas in North America to be both volatile and

significantly higher than the latter half of the 20th century. Figure 6 indicates the trend in US Gulf Coast (USGC) gas costs over the past several years. (US DoE) The USGC pricing for natural gas is a historical benchmark that the industry uses to gauge global trends. Crude oil prices are a factor affecting natural gas pricing, and in North America at least, natural gas prices remain elevated.

Electricity reliability continues to be a serious concern from both competitiveness and plant operations perspectives since the August 2003 blackout in Ontario. Higher electricity prices, uncertainties created by proposed deregulation of electricity markets and political decisions to phase out coal-fired electricity generation in the east have impacted chemical businesses in that region. Some electrochemical producers of inorganic chemicals continue to be hard hit by higher electricity costs which negatively impact margins even though they expect to maintain current sales levels. Abundant supplies of hydroelectric power in Quebec and British Columbia prevent this same regional effect, while Alberta depends on thermal generation of electricity from their natural gas resources.

Few Suppliers Lack of raw materials or poor quality materials also prevented some chemical companies from meeting customer demands. On a more general note, ethane feedstock supply is currently limited, thereby restricting major new petrochemical capacity additions, primarily in Alberta.

2.2.4.6 Public Policy Issues that Affect the Industry

Several significant public policy issues could influence the outlook for chemicals in Canada.

Federal and provincial governments need to develop an energy issues agenda that is coherent and integrated to encourage adequate ongoing supplies of natural gas feedstock and fuel for existing and new plant capacity. Canada must establish a workable Green House Gas (GHG) implementation plan that will provide industry with a platform that enables companies to plan and budget for future investments and processes that support industry growth. The plan must establish reasonable intensity targets for industry, provide policy certainty, facilitate investment in new technology, and establish a sound framework for government and industry GHG agreements. Provincial governments must address electricity issues so as to provide competitive, reliable supplies. This will require new investment in generation and transmission capacity and reliability. Work on transportation security and improvements in efficiency of cross-border chemical movements must continue.

Canada must also encourage new capital investment by introducing new or more corporate tax advantages to offset disadvantages, including the effects of investment incentives offered in competing jurisdictions. To effect this, manufacturing and processing tax rates could be lowered from the current rate of 17 percent and the federal corporate surtax could be eliminated to help investment.

The federal government's Smart Regulations initiative addresses regulatory issues and is an example of a good way to encourage industry. This initiative should continue to seek other ways to reduce the bureaucracy that complicates domestic and foreign investment.

In summary, the chemical industry in Canada is mature and dependent upon economic conditions and low cost production environments for economic viability. It is an industry that continually struggles with negative public perceptions about its products. The industry must overcome problems related to a small market, fluctuating foreign exchange rates and many other external factors. While the industry has done a good job of self-regulation through Responsible Care, it needs to focus more strongly on the social aspects of business in today's globalized marketplace.

3 INDUSTRY BUSINESS CASE FOR CSR

“If you don't accept responsibility for your own actions, then you are forever chained to a position of defence.” Holly Lisle, 1992

The fundamental question this paper tries to answer is “Should chemical companies in Canada implement CSR in addition to RC? Chapters 1 and 2 respectively introduce the concept of voluntary initiatives including CSR and RC and provide an overview of the Canadian Chemical industry. Chapter 4 discusses the similarities and differences between the two initiatives and shows where gaps in each can be addressed through the other. This chapter develops the business case for voluntary initiatives and begins to explain why businesses are interested in adopting them.

In these early years of the 21st century, corporations are finding that just “doing business” is not enough to manage the evolving expectations of society and corporate stakeholders. Even though most companies cannot and do not intend to meet all stakeholder expectations all the time, there is great internal and external pressure to behave and be seen to behave in socially acceptable ways. The issue is that the definition of “socially acceptable” has radically changed over the last half-century. For example, chemical companies that implemented Responsible Care in the 1980s in response to public image problems related to plant safety and chemical risks are now discovering that this initiative may no longer meet the new public definition of safety and risk and may therefore not be suitable to maintain the public license to operate. The real point is, that the public expects companies to do more than employ people and make a profit.

The business case discussion that follows is aimed at CSR but can be applied to any voluntary initiative including RC. This case pays particular attention to how voluntary initiatives can create real value for an organization, as opposed to just creating costs or creating only intangible value.

Figure 7 – Value Creation Matrix

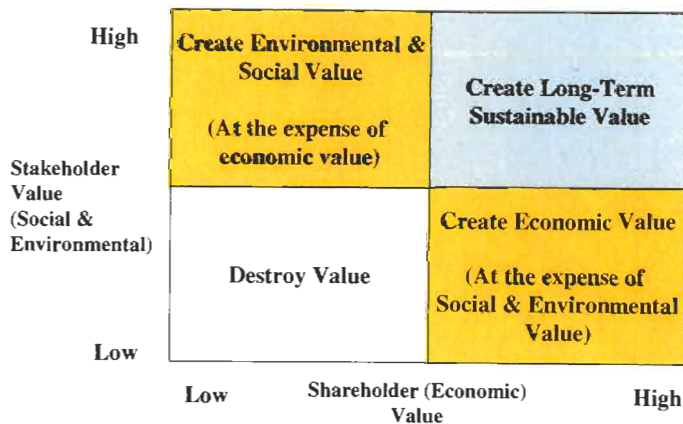


Figure by author; Information source: Sustainable Value Partners

The Value Creation Matrix in

Figure 7 shows that achieving social and environmental value must be balanced correctly with achieving economic value for a corporation to realise long term sustainability. Too little focus on either social / environmental or

economic issues destroys corporate

value. Too much focus on one or the other creates long term instability. Until recently, much or most corporate effort was focused on creating value on the economic side, CSR and other voluntary initiatives are working for balance. Profit should not be a “dirty” word since that is what keeps the economic engine working, however profit without social and environmental conscience is no longer an acceptable way to operate.

3.1 Role and Responsibility of the Corporation

Under Canadian Law, a corporation is a legal entity, apart and distinct from a natural person. A corporation often has legal rights that closely approximate those of a natural person (Wikipedia, 2005). This entity can own property, carry on business, borrow, lend, sue or be sued. Law professor and author Joel Bakan points out that as a legal entity, corporations have only one

objective, and that is to create wealth for their shareholders, (Bakan, 2004) and since the days of Adam Smith's "invisible hand" (Smith, 1776), economists and finance executives have espoused this concept. Over the last 150 years however, the theory that corporations should maximize value for stakeholders rather than shareholders has challenged that thinking. The contrarian approach to CSR includes opinions that "The proper guardians of the public interest are governments, which are accountable to all citizens. It is the job of elected politicians to set goals for regulators, to deal with externalities, to mediate among different interests, to attend to the demands of social justice, to provide public goods and collect the taxes to pay them, to establish collective priorities where that is necessary and appropriate, and to organise resources accordingly. The proper business of business is business. No apology required" (Economist, 2005:22). In another article, the publication characterizes CSR as "one of the biggest corporate fads of the 1990s" (Economist, 2005:53) and goes on to say that the only industry profiting from CSR is the CSR industry itself. Other researchers and authors contend that Socially Responsible Investing (SRI) tends to depress the overall level of investment and re-investment in firms (Barnea, et al, 2004) and that the adoption of CSR may be considered akin to an agency conflict (Barnea, Rubin 2004). The debate between management academics about the "right" objective for corporations' responsibilities of executives (Krishnan, 1973; Sudaram and Inkpen, 2004) and whether CSR presents any benefits or competitive advantages that support the objectives (Porter and Kramer, 2002) still goes on.

3.1.1 What is Value Maximization?

An issue that clouds the pro- and anti- CSR debate is the definition of corporate success. In the eyes of stock markets, success is equated to shareholder value maximization as measured through share price appreciation (Handy, 2002). Share prices are tracked virtually moment to moment and corporate executives face enormous pressure to produce results that are better than last quarter. Influencing stock prices quickly by postponing future expenditures or seeking growth through

acquisition rather than organically are tools often used to enhance the numbers, but these strategies tend to fuel market and investor obsession with short-term results. Some of these investment decisions can result in underinvestment in productive capacity, worker skills and technology that underpins future performance (Hayes, Garvin 2001). Still, while share price is a neat and tidy accounting summary of success, it may no longer be fully representative of overall corporate value. Business terms have changed (Handy, 2002). When corporate laws were being set, the investors and financiers of companies were often owners and managers and companies consisted of physical assets – and making share value a priority made sense. Today however, firms often derive their value from intellectual property, patents, brands, and a skilled and creative workforce. Increasingly, markets and stakeholders are placing value on attributes other than share price, such as stability, financial prudence, risk management, customer and public trust and reputation. Still others value a corporation for the likelihood that it will continue to be a going concern in ten, 20 and even 50 years. CSR is an activity that supports many of the intangibles that are not shown on a balance sheet and which aligns more with long-term rather than short-term value creation. As a result, a big problem for the decision makers in the CSR debate is accurately measuring its future value and the value of liabilities avoided, when current accounting systems tend to focus on historical events, tangible assets, and known liabilities.

3.1.2 Why should any company implement CSR?

A closer look at how and why CSR is important to business from various stakeholder perspectives may help to determine how CSR might fit into the modern corporation's business proposition. Kiernan postulates that financial statements really provide static, retrospective, and partial pictures of a firm's worth and asserts that most of any companies' risk or value for that matter occurs under the radar of financial information (Kiernan, 2004) just as shown in Figure 8.

The issues that affect the “financial capital iceberg”, particularly those that represent the

Figure 8 – Underlying Financial Issues

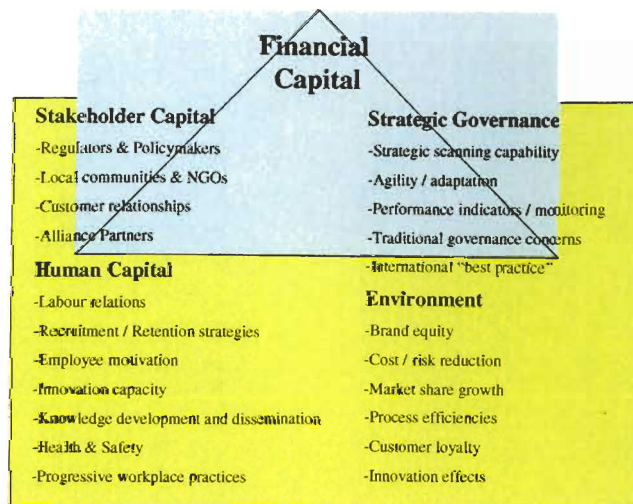


Figure by author; Information source: Kieran, 2004

intangibles like corporate image, reputation and public credibility lurk beneath the calm, publicly disclosed exterior.

3.1.2.1 Public Stakeholder Demand

Changing expectations, coupled with increasingly eroded public trust in elected officials and other traditional authority figures (including corporate executives) make CSR a popular choice for a vast multitude of stakeholders when evaluating non-fiduciary corporate performance.

Increasingly, corporations are recognizing this attitude partly due to the results of studies such as the Millennium Poll on Corporate Social Responsibility. This study clearly shows that citizens of many countries no longer think that the traditional and legalistic interpretation of corporate objectives is sufficient. In one of the first global studies of public attitudes toward CSR, the Poll surveyed over a thousand citizens in 23 countries on six continents. The results revealed that the notions of transparency, accountability and the belief that corporations are responsible for more than the maximization of shareholder wealth are gaining strength around the globe. For example, Environics findings show that two thirds of citizens want companies to go beyond historical roles of making profits, paying taxes, employing people and obeying the law (Environics, 1999). Other findings conclude that more than half the people surveyed pay attention to the social aspects of

corporate behaviour and that the majority of people form impressions of companies through their social behaviours and not from brand reputation or financial status.

3.1.2.2 Business partner demand - Customers, Suppliers, Lending institutions

Companies cannot do business in isolation. Each company operates according its own unique business drivers however they need cooperation and support from business partners (not in the legal sense) to source operating capital, raw materials and labour to bring their products to market. Suppliers expect prompt payment, customers expect quality products delivered on time, banks expect repayment of debt and firms expect those same behaviours from their suppliers and customers. A firm's behaviour and performance in these areas can influence the operational health of business allies and affect the success and health of the firm.

All business entities seek to reduce risk using laws, regulations, contracts, agreements and performance standards, many of which now include clauses that require adherence to codes of conduct covering CSR issues such as labour relations, human rights, and the environment. These clauses go far beyond the strict legal requirements of business, and yet have become firmly entrenched. As an example, financiers for large-scale construction and development projects in foreign countries often require project proponents to sign on to the "Equator Principles" as a prerequisite for funding approval. These principles, which were drafted as an outcome of a 2002 International Finance Corporation (IFC) meeting of banking institutions, are a framework that financial institutions use to manage the social and environmental risks of project financing.

3.1.2.3 Shareholder demand – risk reduction and reputation management

While earlier discussions may have presented the idea that all shareholders are interested only in share prices, this is in fact not entirely true. Many investors, particularly institutional investors like pension funds also look for stability, growth, steady earnings and dividend payments. These

investors are looking for a company who will minimize risks to the corporation and maintain a solid reputation in order to protect the firm's total value.

There is a third and growing group of investors who, while looking for the same returns on their investments as the first two, are adding value or a premium related to the social and environmental impacts of the investment vehicle into the mix of investment criteria. This group drives what is generally called either sustainable investing (SI) or socially responsible investing (SRI). SI/SRI is no small sector; in 1999, US SRI portfolios were valued at \$2.2 trillion (19 percent) of professionally managed assets, while at the same time in Canada the SRI asset value was \$52 billion. (Connelly, Lithgow, 2005) Born through the success of investor activism against apartheid in South Africa, SI/SRI has grown significantly in the last 20 years and has evolved from simple screening techniques to increasingly sophisticated analytic tools that measure social and environmental performance of potential corporate investments. There are established benchmarks for performance that determine if a particular firm is deserving of selection for SI/SRI. Most recently, the SI/SRI sector, not content with the rate of improvement achieved through screening and selection processes, has become more active in encouraging firms to do more. The target firms are already good performers that still have opportunities for improvement in the social and environmental arenas. SI/SRI intends to spur these companies to action using a variety of techniques, which can include shareholder activism such as proposals to shareholders being brought to annual general meetings. As noted by Deb Abbey, ethical investors do not see any sense in embarrassing or punishing companies for poor social, environmental, or ethical performance. Instead the thinking is that pressure must be applied to encourage firms to address the social, environmental, or ethical issues that matter (Abbey, 2004).

3.1.2.4 Employee Demand

A key management development in the late 20th and early 21st centuries is the recognition that employees, in particular competent, committed and engaged ones are key contributors to a firm's competitive advantage. It is also acknowledged that prospective employees are more selective in choosing employers than ever before. As discussed earlier, the public, which includes talented potential employees, tend to evaluate firms through their perceptions of the company's contributions to society. Firms who are leaders in CSR are considered among the "best" companies and are more successful in recruiting, retaining and motivating the best people.

Once employed, staff expects fair, honest and respectful treatment from management. Neither the Dickensian dictatorship nor the efficiency-conscious 1950s production-line approach will work with today's highly educated and skilled workers. High productivity in intellectually based enterprises depends on employee discretionary effort; effort that can be withheld easily by dissatisfied, demoralized or disillusioned people. Dissatisfied people tend to leave companies, creating a real loss of accumulated knowledge, recruitment and training expenses, and productivity gaps while the new hire is trained. In his book, "The Sustainability Advantage" Bob Willard develops a specific methodology for assigning dollar figures to these potential cost savings (Willard, 2002). As well as avoiding costs, CSR and other voluntary initiatives also help build healthy corporate cultures and workplaces that employees are proud to be a part of. CSR includes activities that make the entire workforce feel "good." In marketing, word-of-mouth is acknowledged as one of the most powerful advertising tools that exists yet it cannot be purchased. Employees who feel good about their employer and who have good things to say about the company they work for can exert a huge positive influence on public perception of the firm.

3.1.2.5 Other Key stakeholders demand, - NGOs, Regulators

There are two groups of key stakeholders worthy of special discussion; the Non-Governmental Organizations (NGOs) and governments and/or regulators. These two groups are sectors of the “informed public”, or those who have the time, energy and motivation to dig deep into social and environmental issues. Both groups have great power, but they get it in different ways.

NGOs are non-profit organizations whose members are advocates for public issues that can or may be impacted by business operations. NGOs are numerous and well-known including organizations such as Greenpeace (international), Oxfam Canada, the David Suzuki Foundation (Canada), the Canadian Red Cross and Human Rights Watch. NGOs get and retain great credibility with the public, and in many cases much greater credibility than corporations. NGOs are often large, well funded, and very media-savvy. Because they are seen as advocates for the powerless and are thought of as having altruistic agendas, they have credibility. Their ability to focus on a specific single issue with relentless tenacity is a very powerful tool. Aided by the wide reach of modern communication channels and assisted by the network afforded by the rest of the NGO community, NGOs can raise the profile of an issue throughout the globe in a very short time. Should an NGO choose to focus its attention on a specific company or industry practice, huge impacts can result. There are many examples of NGO activism that have had significant impacts on businesses' right to operate. Boycotts for example, are just one of the strategies in the NGO toolbox to force businesses to change their way of operating. Famous examples of boycott activism include the boycott of Canadian seafood products to protest the seal hunting industry in Canada (www.sealhunt.ca), or the Greenpeace-sponsored European boycott of wood products from Canadian "old-growth" forests. The latter has resulted in permanent change, such as the development of Home Depot's “no old-growth wood products” program. Business is held accountable by NGOs and cannot ignore their concerns or expectations. Business can however work with NGOs for positive change, which when done well, provides the advantage of NGO

credibility being transferred to the business, rendering it more readily accepted by other stakeholders.

Governments and regulators are no less powerful, given their authority to make laws.

Government organizations respect industry as the engine of economic health and in many areas allows industry to self-regulate. Government starts to wield power when it perceives that there is a deficiency in the performance of self-regulation or if the public interest is being impacted. For governments, CSR issues are very tricky to address, and often evolve into no-win political battles. Industry adoption of voluntary initiatives like CSR are both expected and respected by governments since they relieve the elected bodies of some of the burden of micro-managing environmental, human rights and social welfare issues through the often imperfect law-making process.

Some stakeholder groups particularly employees and NGOs, have expectations that are more difficult to satisfy than others. Employees have a very detailed understanding of an organization and will tend to be cynical about changes in direction or attitude from management, particularly if the firm has been laggard about social change in the past. Early change tends to be written off as “a flavour of the month” and only long-term, consistent and well communicated performance on behalf of the firm can overcome this attitude. Since employees are so close to the action, any small slip in behaviour by the firm or its management is noted and attributed to lack of company commitment. NGOs on the other hand are often seeking change that is far in excess of that which can be met. Achieving perfection in attaining zero emissions or in adopting every new technology or social program is often far beyond the resources of a firm yet NGOs will consider the firm a failure if they do not achieve the desired outcome. Finally, both groups continually scrutinize firms for any hint of over-promising and under-delivery on social and environmental programs – a condition called greenwashing. Firms who want to have solid and supportive employee and

NGO relationships will first have to develop the relationship, nurture it and then ensure there is complete transparency in all their stakeholder interactions.

3.1.2.6 Competitive Advantage demand

CSR can contribute to the firm's overall competitive advantage through a number of relationship-based business interactions. Good environmental and social behaviour by a company can enhance its relationship with local governments and regulators, smoothing the way for more cooperative permitting and approval processes for new developments or expansions. Similarly that same good behaviour, can cement good relationships with communities and citizens, preserving and protecting the company's "public license to operate." Good relationships with communities reduce the level of damage control that is necessary should a significant incident with high community impact occur.

The recognition and credibility afforded to CSR is strong throughout the world, particularly in developing countries. Social and environmental programs that have strong employee participation create engagement that is critical to productivity, and hence competitive advantage. Customers,

suppliers and lenders all prefer to work with companies (all other things equal) that subscribe to CSR. These activities create value in ways that are subtle but powerful.

Value creation through CSR can

Figure 9 –Value Creation Model

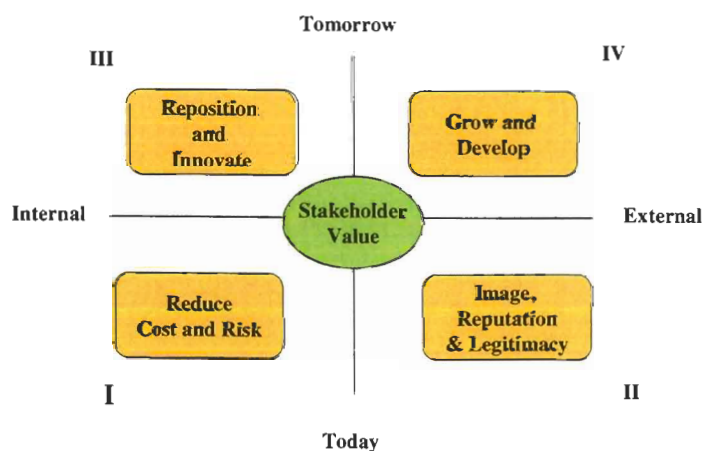


Figure by author; Information source: Hart, 2000

also materialize through the identification of and entry into new and different markets. The stakeholder value diagram shown in Figure 9 reveals that most companies are operating in quadrants I and II with respect to the drivers behind CSR adoption. They work in the “today” mode to manage internal and external drivers and have a short-term view of business performance. A few companies have started to think longer term and are using innovation and repositioning to improve shareholder value. A very few have used CSR and sustainability as a lever to recognize and enter entirely new markets. An example of this would be businesses that provide fuel, water, telephone, banking, lending or other basic goods and services to people with incomes of less than \$1500 per year. While it takes an enlightened and innovative firm to recognize it, these untapped markets consist of the four billion poor and disadvantaged people of the world who are at the bottom of the economic pyramid (Prahalad, Hart, 2002). Other opportunities exist in the development and sale of new technology for such applications as energy efficiency, waste treatment, and natural resources management.

3.1.2.7 The Metrics of CSR Value

A myriad of standards exists for reporting on CSR elements, but for now, few address the need to accurately evaluate the contribution CSR makes to a firm’s bottom line. Often, the numeric monetary measures in these standards are related to spending on environmental control measures, philanthropy, and fines or penalties. These measures present one view of CSR that fits into the “liability” side of the balance sheet and can present a rather negative view of the initiative. Measuring the financial value CSR brings to a firm is difficult and represents one of the biggest obstacles to the wholesale acceptance of voluntary initiatives in boardrooms and other institutions. Financial statements, as previously mentioned, are historical and discuss the financial health of the organization up to the present. The market values a company based upon both its past performance and its future expected performance, and in establishing that future value, places importance on non-financial indicators including elements of CSR or RC. There is,

however, no generally accepted standard identifying exactly which non-financial factors are most important to a firm's success, nor how to measure and report such information (Anderson, 2004). As a result, a very large input to corporate valuation has been either ignored or considered as a qualitative, less-significant factor. A large contributor to this oversight is the structure of financial reporting systems.

There have been attempts to develop processes for valuing voluntary initiatives, including the work of Bob Willard in his book "The Sustainability Advantage" (Willard, 2002). Mr. Willard presents his case for cost savings with respect to employee hiring and retention, productivity, manufacturing expenses, commercial expenses, and risk reduction. He also presents a case for value creation through increased revenue and growth in market share. Mr. Willard not only discusses the case for these, but has also developed spreadsheet tools for a firm to calculate value creation in these areas. This is one of the first tools developed that puts figures to activities and hopefully, will be a springboard for changes in accounting and valuation methods in the future. These spreadsheets are provided for review in Appendix 3.

Companies adopt CSR for many reasons and implement the initiative in many different ways. Each firm sees value in making a commitment to a balanced social, economic and environmental approach to its business. A short case study is included here to provide a specific example of how companies can win (or lose) through the implementation (or lack of) CSR principles.

Methanex Corporation, the case study firm referenced in this paper, was contacted early in 2005 by an ethical investment fund that owned a block of Methanex shares. The firm was intending to bring a shareholder proposal forward with respect to conducting a third-party audit of the firm's liability with respect to greenhouse gas emissions. The strategy is commonly used by ethical funds to "encourage" companies with good performance to move to another level of performance.

Methanex invited the investor to meet with Investor Relations, Environment and Legal staff to gain a greater understanding of the management systems in place at Methanex covering environmental and financial issues. At the end of the meeting, the investment company was satisfied that as a Responsible Care and CSR company, expending funds on a third party audit was not necessary. This is a true life demonstration of one small way in which voluntary initiatives add value

4 COMPARE AND CONTRAST CSR AND RC

“There can be no true response without responsibility; there can be no responsibility without response.” Arthur Vogel

4.1 The Responsible Care Ethic

The development and origins of Responsible Care as discussed in Chapter 1 makes it clear that this initiative focuses specifically on an industrial sector, namely basic chemicals and resins. As a result, the tenets, scope and objectives were developed to meet the perceived needs of society and the sector’s firms in the 1980s era. An example of how the thinking around Responsible Care has evolved for CCPA members is demonstrated by the comparison of two sets of Responsible Care Guiding Principles; one adopted in the 1980s and the revised version adopted in 2003.

The marked change in attitude and approach is striking, and reflects the impact of changing public expectations of industry in general. The evolution is also a result of 20 years of application and improvement. It is worthwhile to note that the newer principles include notions of the social aspect of business activity through the mention of accountability to the public and respect for people.

The ethic is clearly stated, beginning a commitment to do the right thing and to be seen to do the right thing. The CCPA member companies are guided toward environmental, societal, and economic sustainability by Guiding Principles (CCPA, 2003). As shown in Table 3, the guiding principles have changed only once since they were drafted in the 1980s.

Table 3 – RC Guiding Principles, Original and Revised

Revised Guiding Principles (CCPA 2003)	Original Guiding Principles (CCPA 1980's)
* We are stewards of our products and services during their life cycles in order to protect people and the environment	* ensure that its operations do not present an unacceptable level of risk to employees, customers, the public or the environment
* We are accountable to the public, who have the right to understand the risks and benefits of what we do and to have their input heard	* provide relevant information on the hazards of chemicals to its customers, urging them to use and dispose of products in a safe manner, and make such information available to the public on request * be responsive and sensitive to legitimate community concerns
* We respect all people	
* We work together to improve continuously	* make Responsible Care an early and integral part of the planning process leading to new products, processes or plants * increase the emphasis on the understanding of existing products and their uses and ensure that a high level of understanding of new products and their potential hazards is achieved prior to and throughout commercial development
* We work for effective laws and standards, and will meet or exceed them in letter and spirit	* comply with all legal requirements which affect its operations and products * work actively with and assist governments and selected organizations to foster and encourage equitable and attainable standards
* We inspire others to commit themselves to the Principles of Responsible Care	

Table by author; Information source: CCPA

The Responsible Care guiding principles are supported by a Commitment Package provided in Appendix 4, that shows the 151 separate elements for compliance. The six Codes of Practice cover areas of activity such as Research and Development, Manufacturing, Community Awareness and Emergency Response, Transportation, Distribution and Hazardous Waste Management.

Each Code has an associated Implementation Guide that helps members, either new or established, develop or improve their management systems to meet this industry standard. One of the themes that runs throughout all codes is the concept of Product Stewardship which is quite

generally understood to be Responsible Care as it applies to the development, management, sale and transport of chemical products throughout their lifecycles (CCPA, 2003).

4.1.1 The Codes

The Research and Development Code covers risk reduction and management from the point where research on a new product or process begins, through to market introduction. It is specifically concerned with environment, safety or health hazards posed by new products and processes, and the development and dissemination of information about those hazards to post-market users and handlers.

The Manufacturing Code covers the protection of people and the environment from hazards presented by manufacturing operations. Specifically, this code focuses on manufacturing site selection, design and operation of chemical processes, treatment and discharge of effluents and emissions, health and safety of workers and preparedness for emergency situations.

Community Awareness and Emergency Response (CAER) is the code that covers the requirement for all member company facilities to have active community awareness and emergency response programs in place. It places the onus on the company to be sensitive to and respond to community health and safety concerns and to provide a forum for discussion with the public. This code also addresses the requirement for community and industrial cooperation for effective emergency preparedness planning.

The Transportation code covers minimization of risk to people and communities along chemical and chemical products transportation routes. This code addresses the relationship and information

exchange between chemical manufacturers and operators of ship, road, rail or pipeline transportation modes as well as emergency first responders anywhere products are transported.

The Distribution code is closely linked with transportation but covers the activities related to chemical sales, customer education, storage and handling, repackaging and container management. Again, the focus is on risk minimization to people and the environment during all of these activities.

Finally, closing the life cycle loop for chemicals and chemical products is the Hazardous Waste Management code which addresses operations related to waste elimination, reduction, recycling, recovery and re-use. Responsible Care expects companies to apply these waste management techniques to minimize environmental impacts from post-use wastes. These requirements extend to company and privately owned disposal locations.

CCPA, the original developer of Responsible Care, has maintained its leadership role in the evolution of the initiative by being the first association to set specific performance measures and to require mandatory third party verification for compliance. Other associations in various countries have followed suit in the last decade. Finally, as an added measure of commitment and transparency, CCPA formed a National Advisory Panel in the 1980s. The National Advisory Panel (NAP) is group of individuals who represent the public at large and have the skills to assist CCPA to recognize and more broadly understand public needs and concerns. One of the important aspects of their work is to provide commentary on areas for enhancing Responsible Care and the industry's relationship with the public.

Membership in CCPA is strictly voluntary, however once a company joins the association, Responsible Care becomes a requirement of that membership. Notwithstanding the changes in

the “direction” of the guiding principles, the day-to-day scope and implementation of the many Code requirements has not changed significantly since they first appeared. Responsible Care implementation is not an easy task, however when successfully done, it carries with it many of the benefits discussed in Chapter 3. Successful implementation is managed and measured through three processes.

4.1.1.1 Verification

Prior to 1995, the CCPA required member companies to complete and submit self-assessment forms that provided information about their completion of RC implementation milestones. Submitted quarterly, these assessments were used to both measure and monitor member company progress toward full compliance. In 1995, responding to both National Advisory Panel input and changing public expectations about transparency, CCPA began requiring mandatory third party verification that Responsible Care was truly in place at all member companies. The process has three objectives; to help companies improve their systems; to help the overall industry make improvements in performance; and, to raise the credibility of the process in the eyes of the public. The verification team is composed of industry experts, public advocates (often members or former members of the National Advisory Panel) and local citizens. The team will specifically look for a thorough understanding and application of the ethic at all levels and that management systems to support the ethic and incorporate a continuous Plan, Do, Check, Act cycle. To assess a company, the team conducts site visits, company representative interviews, community leader phone surveys and then produces a summary report of their findings. These reports are shared publicly through the CCPA website. While not strictly a pass or fail process, each member company is held accountable for taking action to address any findings. Verifications are repeated on a three-year cycle. On each visit, the verifiers look specifically for improvements in the weaker areas that were identified during the previous verification.

4.1.1.2 Mandatory Performance Metrics and Reporting

CCPA has five specific performance reporting systems in place; the National Emissions Reduction Masterplan (NERM) and the Reducing Emissions Report; Transportation Incident Measurement (TIM); Safety and Health Analysis, Recognition and Exchange (SHARE); Process-Related Incidents Measure (PRIM); and Hazardous Installations Self Assessment Tool (HISAT).

NERM, which has been operating since 1992, is a system for reporting environmental performance at member company manufacturing operations. Each year, member companies submit data on emissions, discharges, waste generation and disposal with the objective to achieve reductions over time. This data is collated into a widely-distributed public report called Reducing Emissions.

TIM is a reporting process that allows member companies to communicate aggregate transportation incident data to its stakeholders and to compare their own incident data to an external benchmark. This measure also provides a snapshot of the industry's progress in reducing incidents. The measure is of the number and severity of transportation incidents per volume of chemical products shipped per year.

SHARE, first created in 1982, is a process by which member companies report safety statistics for injuries and illnesses that occur at their sites. The categorization of incidents is harmonized with US Occupational Safety and Health Act (OSHA) and Bureau of Labour Statistics (BLS) benchmarks and all companies are expected to submit data as part of their RC commitment. These data are compiled for not only employees but also contractors who work at member company sites. Continuous improvement is expected and CCPA provides recognition awards for performance excellence in this category.

PRIM reporting is intended to assess performance in process safety management, provide focal points for process safety management (PSM) incident root causes and to identify common PSM trends. Process-related incidents are reported in the categories of “Critical”, “Major” or “Serious” depending upon consequence severity.

HISAT is a questionnaire, originally developed by the now defunct Major Industrial Accidents Council of Canada (MIACC) and is intended to help companies assess their potential risk profile and increase their awareness and preparedness using techniques to control unplanned incidents. The tool asks questions about incident prevention and emergency preparedness and based upon the responses, categorizes a site as meeting Essential, Enhanced, or Excellent levels of preparedness. Member companies must meet the “Essential” benchmark as part of their RC requirements.

4.1.1.3 Involvement

In addition to all of the above requirements, CCPA expects and depends on member company participation or “sweat equity” as it is known, to keep the association and Responsible Care alive and evergreen. With this comes the requirement that CEOs sign an annual Responsible Care re-commitment letter and that senior executives of member companies sit on the Board, Steering Committees or other working groups that make Responsible Care a part of corporate activity. Peer pressure between company representatives at Responsible Care Leadership Group (RCLG) meetings ensures that no company lags behind the others, ensuring that even the smallest can make a contribution.

4.2 Elements of CSR

The requirements of Corporate Social Responsibility are less easy to articulate since they apply to a group of broad issues rather than a common set of industry sector activities. CSR is less structured, and thus it is inherently more difficult to identify “requirements”. Therefore, this section will discuss CSR in the context of expectations or common characteristics of firms who practice CSR. Upon reviewing the guidelines produced by any number of CSR-supporting organizations, the topics generally identified as “CSR issues” include corporate governance / accountability, human resources management, community investment and involvement, environment health and safety, and societal rights.

4.2.1 Corporate Governance and Accountability

Corporate governance is a process and method whereby corporations are directed, administered or controlled. Governance includes laws and conventions affecting a firm’s direction and goals (Wikipedia, 2005). Concerns about corporate governance have been around a long time but have escalated in the last half-century, and exponentially in the last decade, fuelled by scandals like Enron and WorldCom. Why should governance not be a focus inside and outside the boardroom, considering the enormous influence that corporations wield today? Corporate governance is an a complex amalgam of concepts including ethics and corporate values that drive the way businesses operate. The ethics and values part of doing business encompasses activities that range from the role and operation of Boards (Bennis, 2001) to the manner in which executives and employees behave. Ethics is a general term for what may be described as the science of morality; in philosophy, for example ethical behaviour is behaviour which is deemed good or right (Wikipedia, 2005). Values on the other hand is a term that describes the concept of worth in

general and can be related to the reasons for implementing specific practices or policies (Wikipedia, 2005).

Manifestations of “good” Corporate Governance include but are not limited to the existence of a business code of conduct for all employees, clear and formal processes for conducting Board business and for selecting and educating Board members, formal processes in place for breaches of conduct to be highlighted and corrected (a “whistleblower” process) and a robust process for open and thorough debate about CSR issues at the decision-making table. CSR ultimately seeks to strengthen, improve and extend ethics within corporations so as to make doing the right thing a commonly expected and accepted business practice.

4.2.2 Employees and Human Resources Management

CSR principles are concerned with the current or potential relationship between the firm and the employee population. The expectation is that the firm will have fair recruitment practices, giving full and fair consideration to hiring locally, wherever facilities are situated. If hiring locally is problematic because of under-skilled or inappropriately skilled local labour, the firm is expected to participate in developing education or re-education programs that bring local workers to the required hiring level. Recruitment and hiring processes are also expected to identify and address issues of appropriate workplace diversity, ensuring that the workplace fairly represents the demographics of the working population with respect to differences such as gender, race and religion. If this is again not possible due to skills issues, the company may need to fall back on the education process to address it. In addition, existing employees must be provided with a safe, respectful and non-threatening workplace where work and pay practices are fair and equitable, particularly across age and gender groups. Other marks of a “Good Company” (CBSR, 2002) are that employees are provided with job descriptions, performance reviews and opportunities for

development during their employment and that there are processes in place to regularly communicate with employees about the firm and its activities. The communications process should also regularly ask for employee feedback on how well the company is doing on employment, governance, fairness and other CSR issues.

4.2.3 Community Investment and Involvement

The relationship between a company and the community in which it operates can and should be close and mutually beneficial. A business must ensure that a community will get benefits from its presence and under CSR, these benefits include identifying, understanding and meeting community needs. This may be done through donation and sponsorship programs, engaging in long-term partnerships with community organizations (such as educational institutions), and use of local suppliers and services whenever possible. When smaller local services and suppliers are used, companies who practice CSR pay bills promptly. CSR also expects a company to enter into and maintain a healthy dialogue with its community about the firm's plans and activities and the community's needs and concerns. Getting community representatives involved in corporate development plans will go a long way toward ensuring both the firm and the community gets what they want.

A short aside here is necessary to note that community investment is often equated with philanthropy. Philanthropy is often viewed as the stereotypical activity whereby a large private firm or individual donates large amounts of money to a charitable cause. While this is one definition, there are many other ways to contribute. Under CSR, philanthropy has a place, but it must be viewed as a targeted and strategic activity that provides long term value for both the donor and recipient. For example, strategic investing is like spending money to teach people to grow wheat and make bread, rather than donating the bread itself.

4.2.4 Environment, Health and Safety

One of the most basic of requirements for CSR is to comply with all laws and regulations regarding environment, health and safety protection. In addition to that, the expectation is that the company will also commit to minimizing potentially negative impacts of its operation on people and the environment. The firm must pay particular attention to immediate impacts from spills and releases, but will also address the long-term impacts by understanding the life-cycle of its products and services. Good companies protect the environment by making responsible environmentally-friendly purchasing decisions and by practicing the reduce, reuse, recycle and residual management approach to wastes. CSR companies assign responsibility for Environment, Health and Safety to a competent person(s) and give them the appropriate level of authority to manage that aspect of the business.

4.2.5 Societal Rights

Under CSR, the rights of society, both present and future, must be protected. Companies must assess today what the impacts of proposed developments might be tomorrow, on the people that live in and near the development project. If that location is in another country, particularly a developing nation, care must be taken to understand the impact of the development on the culture, social structures and lifestyles of the people, particularly if the development also means dislocation of people from their places of residence. The expectation of firms who adopt CSR is that the recruitment policy and practices will prevent the possibility of child labour at any of its facilities, subsidiaries or toll manufacturing locations. Finally, firms must consider the “aftereffects” of development so that the community is able to survive and thrive if the firm must close or relocate.

No less challenging are the more global social issues resulting from business activity and global development such as use and depletion of extractive resources, climate change, and loss of habitat and diversity. CSR expects that firms will take responsibility and actions for the part they play in these business outcomes.

4.2.6 Comparison Summary

CSR is a key issue for all corporations. It is all about pursuing long-term corporate objectives in a way that balances corporate activity with evolving values, norms and expectations of general society (Greenall, 2004). Responsible Care is a Canadian creation that encompasses an ethic for the safe and environmentally sound management of chemicals throughout their life cycles (CCPA, 2005).

Table 4 –Comparison of RC and CSR Focal Points

Focus	CSR	RC
Corporate Governance and Ethics	- Business ethics, accountability, transparency, and governance	- RC ethic, not business ethics or governance
Employees and Human Resources	- Recruitment, treatment and development of existing / potential employees	- H&S, training, selection for competence, assignment of authority
Environment, Health and Safety	- Environment and public H&S rather than individual H&S	- Fully covered, internally and externally, a major focal point of RC
Societal Rights	- A major focal point of CSR	- Notionally covered in guiding principles
Community	- Social benefits for communities and people, involvement of society in development decisions	- Technical risk reduction, emergency response and communications about hazards & risk, awareness

Table by author; Information source CCPA and CBSR

Based on earlier discussion, we begin to see similarities and differences in CSR and RC, particularly in the areas of focus and implementation. These differences are outlined in Tables 4 and 5. We find that CSR focuses on broad, ever-changing societal issues whereas RC focuses on established specific and fairly technical industry sector issues. While the two overlap in many areas, each of them addresses certain gaps in the other and as a result complement each other when both are adopted by a chemical company.

Table 5 – Comparison of RC and CSR Implementation

Corporate Social Responsibility	Responsible Care
Fully voluntary with few set performance criteria except perhaps reporting.	Joining CCPA is fully voluntary, but the membership requirement to adopt RC is not.
Very flexible and can be adapted to any industry or sector activity.	Specific sector focus and goals related to common industry sector needs.
Requirements and reporting systems are not clearly defined.	Specific requirements for conformance and for reporting.
Well known to a wide range of industry sectors, in many countries.	Known in developed countries that have a chemical industry association.
Risk reduction is focused on social aspects for a wide group of stakeholders	Risk reduction is focused on the technical aspects for an industry group of stakeholders
Primarily forward-looking, particularly in the long-term sense.	Applied real-time at facilities and specific communities; and for near-future events
Ethics driven and activities-based.	Ethics driven and activities-based.
Broad scope	Narrow scope.
Implementation requirements in the form of guidelines (open to interpretation)	Implementation requirements in the form of codes of practice (open to interpretation)

Table by author; Information source: CCPA and CBSR

5 CSR IMPLEMENTATION CASE STUDY – METHANEX

You cannot escape the responsibility of tomorrow by evading it today. - Abraham Lincoln

5.1 What is Methanol

Methanol, also known as methyl alcohol, methyl hydrate or wood alcohol, is a chemical compound with the chemical formula CH_3OH . It has the simplest structure of all alcohols, and is a light, volatile, colourless, flammable, poisonous liquid that is used as an antifreeze, solvent, fuel, and to produce countless consumer products. Methanol is produced naturally in the anaerobic metabolism of many varieties of bacteria and as a result, there is always a small concentration of methanol vapour in the atmosphere.

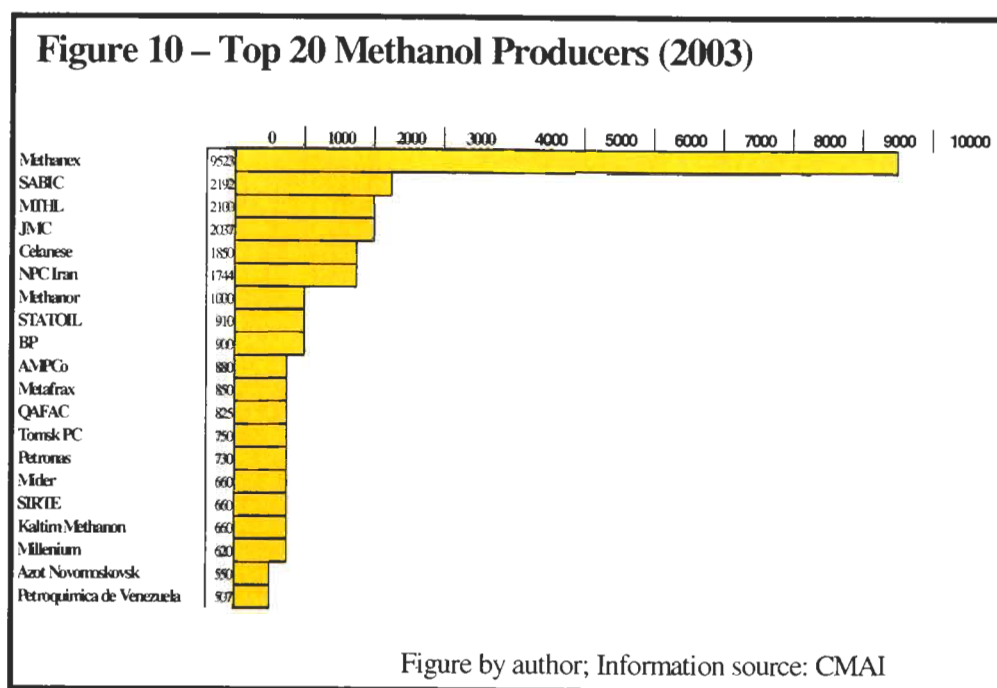
Today methanol is most commonly produced commercially by conversion of natural gas, however virtually any carbon-bearing feedstock can be used. At moderate pressures (10-20 atm) and high temperatures (around 850°C), methane reacts with steam on a nickel-based catalyst to produce syngas according to the chemical equation $\text{CH}_4 + \text{H}_2\text{O} \rightarrow \text{CO} + 3 \text{H}_2$. The carbon monoxide and hydrogen then react on a second catalyst to produce methanol.

Methanol is used to make countless industrial and consumer products such as synthetic textiles, recyclable plastics, household paints and adhesives, foam cushions and pillows, and even common medicines such as ASA (acetylsalicylic acid). It is also used as a feedstock to manufacture a motor fuel blending component that makes gasoline burn more cleanly and produce fewer emissions. Methanol is also used to remove nitrates from municipal waste water. New applications and uses for methanol are being discovered all the time. For example, in the

near future, methanol could be used as a source of hydrogen for fuel cells that can power everything from laptop computers to automobiles.

5.2 Who is Methanex

Methanex is a Canadian-owned, Vancouver-based, manufacturer and marketer of methanol employing approximately 850 people worldwide. It is an organization whose values of integrity, trust, respect and professionalism have permeated the business and helped to make it the world's largest methanol producer. The firm operates methanol plants in Chile, Trinidad, New Zealand and Canada and has Marketing and Logistics offices in Brussels, Dallas, Santiago, Auckland, Hong Kong, Shanghai and Vancouver. The company also purchases methanol produced by



others, either on a contract basis or on spot markets in order to meet fluctuating supply and demand requirements, to fulfil customer needs and support marketing efforts. Methanex believes that global positioning, an extensive network of storage terminals and world-class expertise in the distribution of methanol, is a competitive advantage. As shown in Figure 10, Methanex has by

far the largest production capacity of any of the global players in methanol production and marketing.

5.2.1 Methanex Strategy

Methanex's primary objective is to create value through maintaining and enhancing its position in the production, marketing and delivery of methanol to its customers. The value is derived from three key elements; low cost, industry leadership and operational excellence.

Low Cost A key element of a low cost structure is to ensure secure gas supplies at favourable prices. Over the last decade, Methanex has been reducing its reliance on mature North American natural gas production and distribution to avoid escalating prices on this continent. Hence, Chile and Trinidad are its most cost-secure hubs, with contracts that ensure ample supply and locked-in prices that are well below those in North America. Methanex also focuses on reducing shipping and distribution costs wherever and as much as possible, since these are the next largest costs of operation.

Industry Leadership Methanex is not only the largest methanol producer and marketer in the world; it is the only company that focuses on methanol as its sole product. Because of this focus, Methanex has been able to establish a truly global marketing and distribution system. More significantly, however, because of the focus, size and leadership, the firm has played a significant role in the consolidation of the industry and in developing a more stable and consequently more effective pricing system.

Operational Excellence Methanex has defined this element of its vision as more than superior plant operation, although this is critical to consistent and secure supply for customers. The

company has also identified Responsible Care, human resource recruitment and talent management and prudent, balanced financial management as being equally important to the success of the corporate strategy.

5.2.2 Methanex History

Methanex began in 1968 when Verne Lyons filed incorporation papers for Ocelot Industries in Alberta. Ocelot was an oil and gas exploration company with a head office in Calgary its owner, Mr. Lyons, had a dream of a consolidated, fully integrated company that would find the gas, drill the wells, develop them, and build the pipeline to the plant that would make a value-added product. He very nearly realized that vision. By 1978, the project to build a methanol plant in Kitimat, British Columbia was conceived, and in 1982, Ocelot Industries had built and started up its methanol plant. However this achievement came at great costs since overruns on the construction budget and a “bottoming out” of global methanol prices at plant start up very nearly sent the company into receivership. As a result, corporate restructuring occurred dividing the company into two separate divisions, oil and gas and chemicals. The chemicals division moved its headquarters to Vancouver, British Columbia in the mid-80s where it remains today as Methanex.

5.2.3 Production

The construction and operation of production facilities have been critical for Methanex throughout its history. Over time, Methanex developed production “hubs” with the two major ones being in Chile and Trinidad as shown in Table 6.

Table 6 - Methanex Production Capacity

	Operating Capacity	Actual Production (000s tonnes)						
		2004	2003	2002	2001	2000	1999	1998
Chile	3000	2692	2704	2932	2783	2912	2309	1700
Trinidad	1921	1161	577	-	-	-	-	-
New Zealand	2430	1088	968	2281	2133	2410	2063	1788
North America	500	486	449	478	445	685	972	1202
Total Capacity	7851	5427	4698	5691	5361	6007	5344	4690

Figure by author: Information source: Methanex Annual Report 2004

Production from the New Zealand hub has declined due to reductions in Methanex's gas entitlements. Because of New Zealand's location it is the natural supply source for the growing Asia Pacific markets therefore that capacity must be replaced. Locations for new plants require certain physical conditions and qualitative considerations such as size of gas reserves, few uses for the available gas and access to tidewater. Using these criteria diligently results in a limited number of appropriate choices leaving the "best possible" choice to be made from a range of less-than-ideal options. These criteria are increasingly pushing Methanex to invest in underdeveloped or developing countries where Responsible Care is unknown. As of mid-2005 Methanex is in the preliminary phase of a project feasibility study for an Egypt-based methanol plant.

5.2.4 Marketing and Logistics

Marketing Methanex markets and distributes methanol around the world. Its traditional customers consist of large chemical companies who use methanol as a feedstock to make their derivative products. The world demand for methanol is driven by world economies and as these fluctuate, commodity chemicals like methanol experience cyclical supply / demand imbalances that result in volatile prices that plague the methanol market. New uses for methanol being developed such as direct methanol fuel cells to power portable devices such as laptops and cell phones are fast becoming a reality. Widespread adoption of these applications will one day turn methanol into a retail consumer product.

Logistics Methanol can be transported via many modes but the most important is by marine vessel. Methanol is pumped from coastal plants by pipeline to nearby deep-water ports for shipment using vessels chartered by Methanex's wholly owned subsidiary, Waterfront Shipping Company (WFS). Based in Vancouver, WFS operates the largest fleet of dedicated methanol tankers in the world.

As shown in Figure 11, Methanex has distribution terminals and storage facilities strategically located throughout the world, with key distribution hubs in Rotterdam, Houston, New Orleans and Korea. Methanex also leases or owns storage and terminal facilities in the US, Canada, Europe and Asia. Other modes of transportation used in the delivery system (mostly in North America and Europe) are barges, rail and, to a lesser extent, trucks.

Figure 11: Methanex Global Methanol “Pipeline”

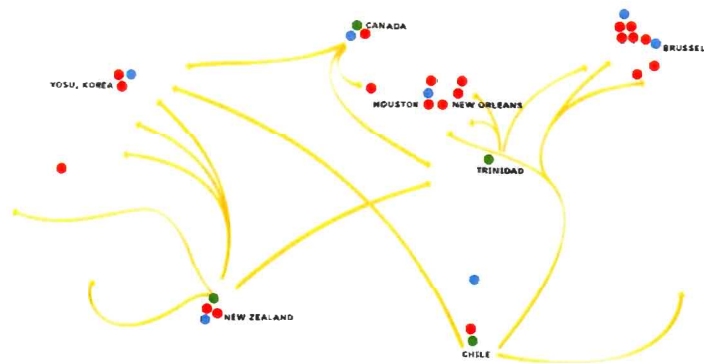


Figure by author; Information source: Methanex, 2005

5.3 Responsible Care at Methanex

While Ocelot Industries was a member of CCPA from the mid 1980s until its divestiture of the chemical business Ocelot's struggles with financial and resource issues severely eroded the firm's appetite and ability to fully implement the Codes of Practice. This all changed when Methanex

was formed in 1992. Throughout its history, Methanex has been a member of CCPA and strong supporter of Responsible Care. The deep roots its executive team had with other companies who had adopted RC, namely NOVA Chemicals made it an easy decision to implement Responsible Care in the “new” company. In addition, the rapid growth through merger and acquisition that occurred from 1992 through 1994 resulted in a global company that was merely a collection of non-integrated business units that had different cultures, different operating styles and different perspectives on how the business should be run. Cultural differences can be a significant factor in making mergers and acquisitions work (Carey, 2000) and the senior management team searched for every way possible to engage and unify its organization in a hurry.

Everyone respected the ethic and objectives of Responsible Care as the umbrella for environment, health and safety management systems, so it was chosen as an ideal initiative to help integrate the business units and develop a unifying Methanex corporate culture. The timing was perfect; just as Methanex had concluded its last major acquisition in 1994, the CCPA was deciding to make third-party verification of Responsible Care a mandatory process. In early 1995, Methanex’s CEO Pierre Choquette announced that Methanex would undergo re-verification for Responsible Care by 1996 and it would do so globally, rather than at the Canadian sites only. This horrified the RC practitioners of that time, but immediately triggered action throughout the organization to develop and implement the right processes and systems in a very short time. It also served to unify corporate thinking and performance for all of the activities that fall under the Responsible Care umbrella. As a result, there was a level of cooperation and information exchange throughout the global organization that otherwise would have taken years to develop. Methanex was RC verified in 1996/97 by the CCPA as being in compliance with RC Codes in a process that lasted four months and included site visits to all of Methanex’s locations.

To this day Methanex remains the only CCPA member company to have done a global verification. A description of how Methanex is implementing RC and CSR follows. Methanex considers the implementation of these voluntary initiatives to be a perpetual work-in-progress, as continual improvement is a company-wide credo.

5.3.1 RC Management System at Methanex

Methanex implemented Responsible Care through a simultaneous top-down and bottom-up approach which resulted in an overall Responsible Care Management System that fits Methanex's management style and matrix structure. The firm maintains a lean, flat, decentralized organization with few hierarchical levels and tends to augment the resources of each facility within the Methanex umbrella using multi-regional teams of specialists or "business experts". The Responsible Care systems incorporate the Plan, Do, Check, Act cycle for all aspects of the business.

The Management System for Responsible Care begins at the Board of Directors where there is a sub-committee that focuses on and considers all Responsible Care issues and initiatives discussed by management. It is comprised of four independent Directors who meet twice per year, providing advice and counsel to management as well as reporting its findings to the full Board. Methanex's CEO sits on this committee to represent the corporation as do the Senior Vice Presidents of Corporate Resources, Manufacturing, Marketing, Corporate Development, Corporate Counsel, and the Director, Responsible Care.

RC information, new initiatives, reports and company performance feedback are provided to the Board Committee through a Senior Management Responsible Care and Public Policy Committee (SMRC&PP). This committee comprises all of the Senior Vice-Presidents of the company, the

Directors of Responsible Care and Public Affairs, and the Responsible Care Manager. This group meets twice per year prior to the meetings of the Board and collectively prepares information packages on all activities that occur within the organization that either further develops or influences the Responsible Care ethic. The Senior Vice Presidents who sit on this and the Board committees have ultimate responsibility for the implementation and continuous improvement of RC within the business functions they head.

Two full-time positions at the Corporate level are responsible for managing the global implementation, reporting and improvement of RC systems at Methanex. The Director, Responsible Care aligns the strategic direction of RC programs and reporting in Manufacturing, Corporate Development, Legal and Finance to that of the overall Corporate Strategy. The Responsible Care Manager supports the Director and manages RC implementation and development throughout the global Marketing and Logistics businesses. These two people sit on the senior management committee and the Director sits on the Board Committee as described earlier.

The senior Methanex officer at each location reports directly to one or another of the Senior Vice Presidents. These senior officers are responsible and held accountable for developing, implementing and managing all RC programs that are delivered on the “front line”. They are responsible for achieving compliance with RC requirements at that site and for implementing actions to respond to opportunities for improvement highlighted in RC verifications and audits. Each site has RC practitioners who provide environmental, health and safety, emergency response and security expertise to enable compliance. The senior managers report upward to the management committee and take RC strategic and/or policy direction from them.

The management system loop is closed through the work of a Global Responsible Care Team (GRCT), which is made up of Responsible Care practitioner representatives from all global sites. Sponsored by the Senior VP Corporate Resources, this group “owns” the Global Responsible Care Audit process, which provides the “check” piece the implementation process. Almost all of the team members report to line managers while the team itself has an ongoing reporting relationship with the senior management and Board committees. This team provides advice and recommendations to senior and regional management about RC standardization, continuous improvement and best practices. Figure 12 is a graphical representation of the Responsible Care management structure .

Figure 12 – Methanex Global RC Organization

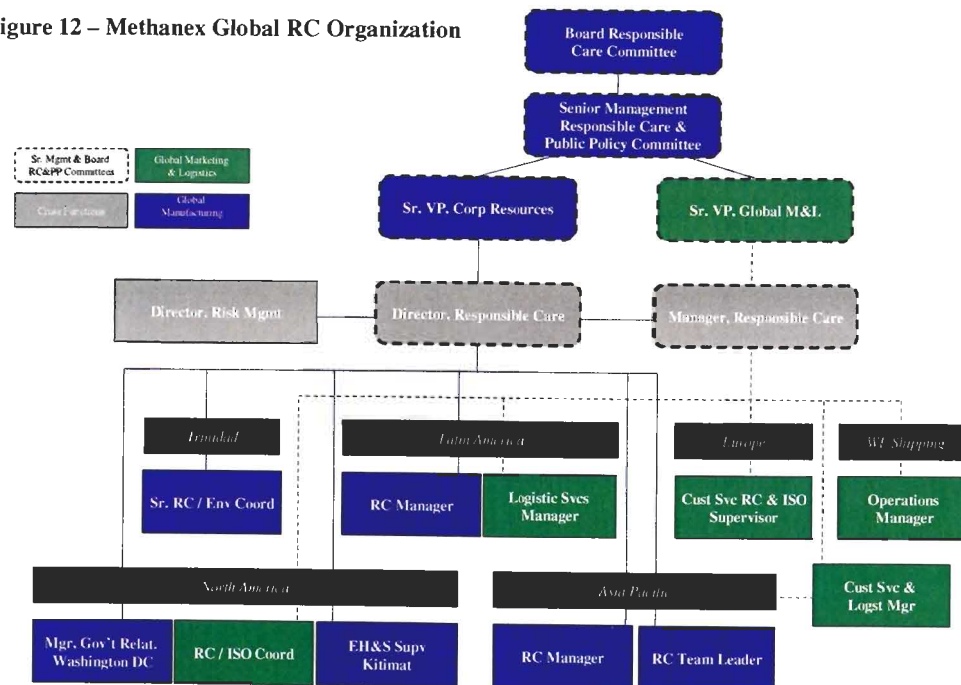


Table by Author; Information Source: Methanex

Finally, all of these groups provide and get reports on the organization’s performance in Responsible Care. Performance is measured against company Key Performance Indicators (KPIs) that are aligned with RC reporting requirements and critical code elements.

5.3.2 Methanex Achievements and Activities in Responsible Care

Methanex is involved in many activities related to Responsible Care, some of which are highlighted here.

- In 2004 and 2005 Methanex completed its third global verification, where emphasis was placed on Marketing and Logistics functions. This area was identified as having the most opportunities for improvement from the last verification process.
- Methanex continues to work at its facility in Trinidad to bring systems into compliance with RC in preparation for a verification process by 2006.
- The company has conducted its first year of data gathering for an employee Long Term Health Study. The goal is to gather a set of basic employee health data around the globe to determine if there incidence of illness or disease is occurring at a frequency that differs from normal demographics.
- Methanex won the CCPA “Excellence in Safety Award” for the fourth consecutive year.
- Methanex Kitimat won an Emergency Preparedness for Industry and Commerce Council (EPICC) award for its Emergency Preparedness programs.
- Methanex has been identified through its verifications as employing industry “best practice” in the implementation of the Responsible Care ethic.

5.4 Implementation of CSR at Methanex

Methanex has a history of being a values-driven organization and has long been forward thinking about social investment and respectful of people and society. Through 1994 to 2005, Methanex developed policies and practices that supported its values of integrity, trust, respect and professionalism and its appreciation of the need to be a valued corporate citizen in all communities in which it operated. Even though these activities were not formal requirements of

Responsible Care, Methanex developed an Anti-Harassment Policy, Corporate Governance requirements including a Code of Business Conduct and a Social Investment Policy. Until 2004, however, there was no unifying management system that integrated these activities into a coordinated process with assigned accountabilities within the firm.

As Methanex began to engage in more operations in less developed countries it was quickly discovered that RC was a little-known concept and that other voluntary initiatives like CSR had much higher target audience recognition levels. At the same time, Methanex was searching for innovative ways to take its overall performance in RC to a higher level and a socially focused direction seemed to be a natural choice. This was particularly the case as the CCPA had just revised its 1980s vintage RC guiding principles to reflect the 21st century desires and expectations of member companies and the public. Table 3, Chapter 4, provides a comparison of the old and new guiding principles.

In 2003, a small steering group, headed by the Senior VP of Corporate Resources, began an 18-month process to select and begin implementation of an appropriate social initiative that would unify our existing socially-focused practices and encourage continual improvement. The group started by investigating elements of various “other” voluntary initiatives and considered adopting the Sustainable Development concept. It became clear rather quickly that this descriptor did not resonate well with Methanex’s employees and its communitarian, (Wexler, 2004) rather “family-like” culture. Sustainable Development just seemed too distant and unattainable, and many people had difficulties with the concept considering the fact that the firm uses large quantities of non-renewable natural gas as its feedstock and energy source. The frequent question was, “if we use natural gas, how can we be sustainable?”

Methanex was convinced that sustainability and the use of fossil fuels were compatible. The steering group was also convinced that the company was socially responsible since it was doing more than just Responsible Care. As a result, the steering group turned to its industrial neighbours to discover what and how firms such as BC Hydro, Alcan, Nexen and Teck Cominco were doing. It turns out that many of them had adopted Corporate Social Responsibility as their umbrella initiative.

After reviewing the tenets of CSR, the steering team felt that it was the initiative that was most closely reflective of Methanex's existing approach to social issues. It is important to note that the firm, with its relatively lean and small employee base did not want to adopt a new initiative that added bureaucracy or significant incremental spending. The idea was to take what the firm was already doing, compare it against an external CSR benchmark, and work toward filling in the gaps using existing resources and organizational structures. One of the main requirements for management in implementing CSR was that the tremendous success in, and focus on, Responsible Care could not be diluted.

Figure 13 – Methanex CSR Framework



Figure by author; Information source: Methanex

Recognizing that CSR was a good fit for Methanex, the steering team began by conducting a detailed gap analysis between the requirements of CSR and what the firm was already doing to address those requirements through Responsible Care and its other systems.

As shown in Figure 13, the underpinnings that support CSR are Methanex's existing corporate values, Responsible Care, corporate governance systems, the social investment programs and reputation management practices. The guidance document used for the gap analysis was the Canadian Business for Social Responsibility

(CBSR) “Good Company Guidelines.” Methanex joined the CBSR organization at this time to take advantage of the knowledge sharing such an organization provides. The steering team found that Methanex was already practicing more than 70 percent of the Guideline requirements. For example, the firm had already been producing a public annual report on Environmental, Health and Safety performance for several years.

Based upon the results of the analysis, the team developed a tentative implementation plan for CSR which identified the existing Global Public Policy, Global Human Resources and Global Communications teams as the champions and drivers of the process. These groups were selected over others for two reasons. The first was to reduce the potential for dilution of focus on RC within the internal organization. The second was the recognition that these teams were the primary drivers of the external environmental scanning and internal communications processes within Methanex. Since a big factor in the success of voluntary initiatives like CSR is appropriate communications, this was seen as a good fit. As part of communications, the steering team developed a presentation package introducing CSR, how it fits with Methanex and its relationship to RC. This presentation has been shown to over 20 employee groups since it was developed.

Within three months of developing the implementation plan, it was communicated to senior management and the Board, with the result that the CSR concept was accepted in principle with the instruction to prepare and present a policy document for approval. Expecting this outcome, the steering group had already begun drafting the Policy on Corporate Social Responsibility and presented it at the next meetings of both the Board and senior management committees. They endorsed the policy in March 2005 nearly 18 months after the initial idea was formed.

Since the policy approval, a company-wide communications plan and a three-year action plan based on the original gap analysis have been completed, while work continues on the adoption of

appropriate and relevant performance metrics that will stimulate both continual improvement and withstand both external scrutiny and the test of time. Given that CSR is newly implemented at Methanex, the systems and structure are not as well defined, nor as smoothly-functioning as that of RC, however the intent over the next few years is to develop these elements in a way that closely follows the successful RC model. Methanex recognizes from its work with RC that these initiatives develop slowly and incrementally – they have no beginning or end, only a path forward. The expectation is that in 2007, Methanex will report on its work within CSR along with RC in a combined Annual Report document.

6 INDUSTRY IMPLEMENTATION OF CSR

“The price of greatness is responsibility.” - Winston Churchill

Having looked at how one CCPA member has approached CSR, this section presents an overview of the current status of adoption of CSR and CSR-like initiatives. The CCPA has 65 members who manufacture chemicals, all of which have adopted Responsible Care. These companies represent over 90 percent of Canadian chemical companies and as a result, it follows that the majority of chemical manufacturers in this country have adopted Responsible Care. For this paper, a survey of publicly-available information was conducted to determine the level and scope of adoption of other social voluntary initiatives. For the survey, various websites were scanned. These included Canadian chemical company websites, the CCPA website which contains company Responsible Care verification reports, parent or owner companies of Canadian companies websites, the System for Electronic Document Analysis and Retrieval (SEDAR) and the US SEC Filings & Forms (EDGAR) sites and the Industry Canada Strategis website. These sites were accessed between May 15 and May 30, 2005 and the raw data is presented in Appendix 5. Wherever possible and present, CSR reports and corporate annual financial reports were scanned to verify the presence of CSR activity and evaluate the quality and scope of reporting.

Data was collected from companies doing business in Canada and included information on ownership structure, size of enterprise (based on employee count), scope of business activity (domestic or international) and level of CSR activity. Data on parent or owner companies (where this was applicable) included the firm size worldwide (based on employee count) and level of CSR activity. It must be noted here that in a few instances, the number of employees was not

available from the sources accessed. In these cases a default value of 100 employees for the Canadian firm and 1000 employees for the foreign parent was assumed for categorization purposes only. The total number of companies reviewed was 65; of which over 95 percent compete in the international marketplace, meaning they sell products or otherwise conduct business in at least one country other than Canada.

6.1 Survey Summary

6.1.1 Ownership

Figure 14 – Firm Ownership

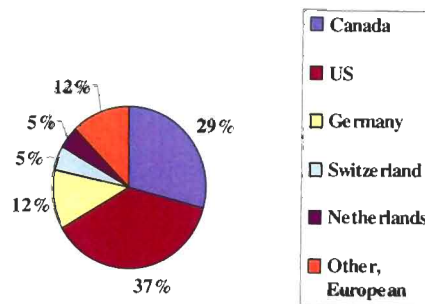


Figure by author

The majority of chemical businesses operating in Canada are foreign-owned or have foreign majority ownership. As shown in Figure 14, only 29 percent of firms are fully Canadian owned, with the largest foreign ownership being US-based. The remaining 34 percent of firms are European-owned. There were no companies owned by African, South American or Asian firms.

6.1.2 Size of Firms

Figure 15 – Firm Size

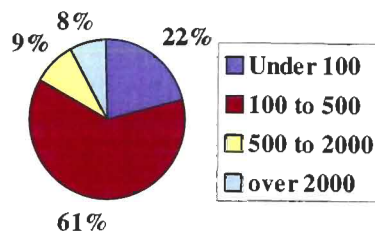


Figure by author

Overall, Canadian-based firms ranged in size from 20 to nearly 8000 employees, but those in the upper end were Canadian-owned firms with employees located in other countries. The average employee population of all the companies is 621. The distribution of small to large firms is shown

in Figure 15. Foreign parents ranged in size from about 1000 to well over 100,000 employees world-wide.

6.1.3 CSR implementation

As part of the data gathering exercise CSR activity was defined as the activities beyond those required by Responsible Care, that is, a wider scope than Environment, Health and Safety.

The level of activity or corporate implementation of a social initiative was determined using the following scale:

- A company or parent was assigned a level of 3 (best performance) if that company had a full description of its social initiative(s) including metrics, and had produced a stand-alone report on that activity.
- A company or parent was assigned a level of 2 if that company provided a description of its social initiatives or philosophy, examples of metrics and outcomes, but no separate report.
- A company was assigned a level of 1 if that company described philanthropic or other social activities and a description of corporate social values, but no metrics.
- A company was assigned a level of 0 if that company described no activities other than those directly prescribed by Responsible Care.

Figure 16 – CSR Implementation Distribution

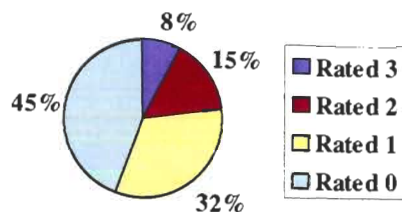


Figure by author

Based on this scale, the implementation of CSR was reviewed by firm size, firm ownership and parent company. Figure 16 shows the level of CSR implementation in all firms covered in the survey, only 23 percent of firms have done or

have formally committed to doing more than the obligations under Responsible Care. Only five

companies were rated in the 3 category and none of the companies in the two smallest size categories were rated as a 3 for CSR implementation (or a similar initiative). Finally, firms who had parent companies that had implemented CSR appeared to be more likely to implement CSR at the Canadian-based facilities since all but one of the five businesses rating a 3 were owned by a foreign parent who had also fully implemented CSR systems. The data indicates that Canadian facilities tend to lag behind their foreign parents in implementing CSR.

The data provokes a number of questions that are beyond the scope of this paper, for example, is CSR an initiative that is too difficult for small organizations? Why do the Canadian firms lag behind their parents in CSR implementation? What factors would make CSR more relevant to smaller organizations?

Finally, it was observed earlier in this paper that the majority of Canadian firms do business with other countries, but their largest foreign market is the US. Does the fact that the Canadian chemical industry's largest trading partner is a developed and industrialized country cause CSR to be less relevant to Canadian firms?

In a sense, it is likely that the latter is the most logical reason for the slow pace of CSR implementation in Canadian chemical firms. As the penetration of Canadian chemical products into other world markets increases, the necessity to adopt stronger social programs like CSR will increase. To do this, Canadian firms can use the solid start they have with Responsible Care and add activities demanded by CSR.

7 CONCLUSIONS AND RECOMMENDATIONS

“Until the great mass of the people shall be filled with the sense of responsibility for each other's welfare, social justice can never be attained.” Helen Keller (1880 – 1968)

This paper has described in detail two voluntary initiatives, Responsible Care and Corporate Social Responsibility. For the chemical industry in Canada, Responsible Care is a given. Based on the discussion presented here, there are excellent reasons for adopting Corporate Social Responsibility as an enhancement to RC. The dual implementation can provide many benefits to a corporation.

7.1 Benefits of Dual Implementation

CSR provides support for the RC ethic, strengthening it internally and externally. The chemical industry acknowledged the social benefits of RC two decades ago by recognizing that there was an increasing match between employee values and those expressed and supported by the company. Implementation of CSR can only enhance that dynamic.

CSR focuses on the social aspects of industry and public interaction in ways that RC does not and fulfils the need to respond to the rapidly changing societal expectations of industry for more transparency, higher accountability and better performance in managing the social and environmental impacts of business. Further, its application provides opportunities to develop a deeper understanding of communities and their needs, leading to a better overall relationship between industry and communities in which it operates. Better understanding of communities

(particularly in foreign and developing countries) can lead to innovations in business processes and methods, or development of “different” markets and new products that better fit the needs of the people in other geographies.

While neither Responsible Care nor CSR are a magic bullets for addressing morale challenges presented by downsizing, globalization and other upheavals, they may be used as a shared and consistent foundation for decision-making.

CSR implemented along with RC enhances a corporation’s reputation, leading to direct financial benefits such as easier access to less costly insurance premiums and lending rates, reduction in time required to get new or change old operational permits and increased credibility within stakeholder communities. These initiatives improve productivity by promoting improved decision making and rational priority setting, opening new avenues for product development and creating marketing advantages as a “preferred supplier.” Finally, in the value-generation category there is a definite value in “cost avoidance” related to legal liability, workers’ compensation, public activism, and contamination remediation. While costs avoided can be estimated for each firm, these will be very specific to that firm and cannot be generalized. That is, it would be difficult for the industry to identify a benchmark of costs in the form of a general percentage of overall sales. Cost avoidance hinges on the long-term implementation of good, ethical, and environmentally sound processes and practices that prevent lawsuits, worker injuries, site pollution and other negative impacts arising from a firm’s activities.

CSR provides a level of international and multi-sector recognition and credibility that is not attainable from RC alone. RC began in Canada, and has spread to over 45 countries; however, it is still best known and understood within the chemical industry sector in its countries of adoption. Other countries and other industry sectors have heard little if anything about RC while CSR is a

globally recognized and accepted initiative. CSR acceptance in foreign and/or developing countries establishes immediate credibility for a company that practices its principles in an open and consistent manner. This is particularly advantageous for companies that are planning to undertake foreign direct investments (FDI) or who have suppliers, customers, and third-party transportation and distribution facilities in other countries. In this globalized business world, this applies to most chemical firms.

RC and CSR have large areas of overlap in the communications, community awareness and environment, and health and safety aspects of business, creating possible efficiencies in the implementation and delivery of both. In particular, CSR applies management, planning and measurement processes to the social and philanthropic activities of companies that until recently have often been ad hoc. The already established RC ethic provides a model for the Plan-Do-Check-Act management system for CSR and incorporates the rigor and continual improvement requirements of other core business functions.

7.2 Recommendations and Best Practices

This section of the paper discusses recommendations and best practices for managing CSR implementation. While not exhaustive, these topics are critical, and managed correctly, will greatly increase the potential for success.

7.2.1 For Chief and Senior Executives

Top executives within an organization have specific and critical responsibilities for enabling the success of any new initiative within the firm. Not only does the leader of an organization need to

be a committed champion who acts as a role model for others, he/she must ensure the foundation for long-term support and development is in place. The firm's leader must ensure this happens by endorsing an appropriate policy statement, clearly allocating responsibility and authority for the initiative and making appropriate resources available. Thus, while the chief executive may not necessarily be directly involved in the detail of implementation, he/she legitimized the process through supporting the initiative.

A policy statement on CSR approved at the highest office within the organization is an integral and critical tool that formalizes and embeds the ethic in the practice of doing business. Firms cannot depend on the "corporate memory" of past values and ethics to extend into the future. People change, circumstances change and attitudes toward values and ethics change – partially because these things are not normally regulated by external organizations. Corporate policy ensures CSR remains fixed within the corporate thought process.

Executives must implement the policy by ensuring a conscious decision-making process

Figure 17 – Ethical Decision Model

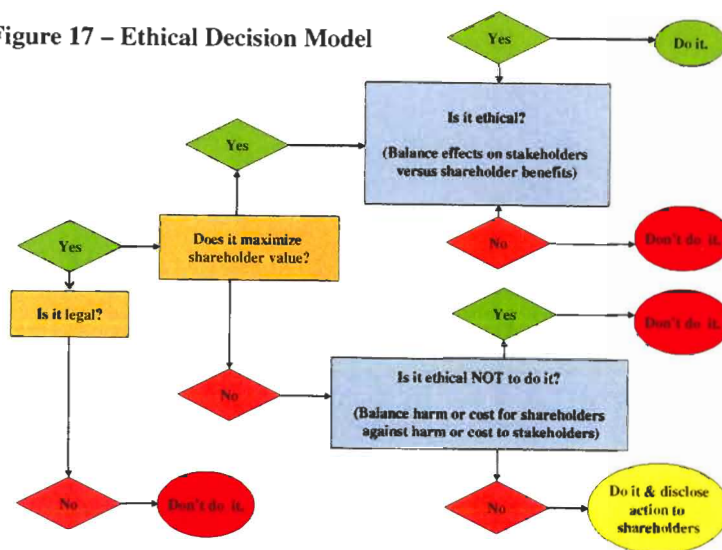


Figure by author; Information source: Bagley

considering CSR issues is carried out for material and strategic decisions. Around boardroom tables, inputs to decisions include multiple issues and many variables in order to select the best options. Traditionally, these issues and variables are heavily weighted

toward financial and technical aspects while ethics were historically included in an unconscious and tacit way. If CSR staff are not part of that the top decision-making group, it is the

responsibility of top executives to apply a conscious process of ethical thinking at the appropriate time and place in the overall decision. See Figure 17 for an example decision model. A fixed process is particularly important for firms that have had historical problems with ethics and values-based decisions. While the process may seem somewhat mechanical, it is vitally important that CSR issues are always consciously considered and discussed.

The first two points are particularly important for CSR since adoption of good ethics within organizations is driven in large part by the decisions and actions of power and thought leaders. Organizations are composed of individuals who, at every level, look for demonstrations of behaviour that set examples of accepted conduct. Bad behaviour within a firm is noticed, but if not firmly squashed, can engender the bystander effect where people “may be aware that the individuals they are observing are acting irresponsibly, yet they may do nothing to intervene because they assume that keeping silent is the norm” (Bansal, Kandola, 2004:3). Even worse, the bad behaviours, if allowed to continue, may become the new norm, even for people who otherwise have innately good ethics.

The Chief Executive of an organization must realize and be convinced when contemplating CSR implementation, that his/her firm has a culture that will not only accept the concept, but is structurally and physically ready for such a move. It has long been acknowledged that to achieve success, strategy and organizational culture must align and that new strategies, programs and initiatives must be accepted by management. While chemical industry firms have embedded RC as a voluntary initiative into their cultures and management, CSR demands a significantly different mindset which can be described as a cultural frame that is required to legitimize social issues as real business issues (Howard-Grenville, Hoffmann, 2003). Consider however, that the timing can be wrong, even if the culture is right. A firm that has experienced major organizational change such as a merger, acquisition or significant downsizing or growth in the last year or two

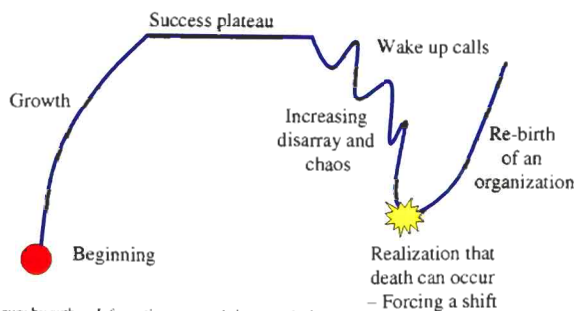
may be physically and mentally exhausted, and completely unprepared to embrace a new initiative. The executives must be sensitive to both of these issues before embarking on a full implementation of CSR.

Finally, the Senior Executive(s) of an organization have the authority to allocate resources for tasks that the firm wishes to complete. CSR, like any other business activity demands sufficient and competent resources in order to succeed. In addition to resources, appropriate accountability, authority and budget to implement the programs must also be given. CSR can be managed overall by virtually any department depending on its structure and capability. For example, some firms drive CSR through their legal department, others through their Environment Health and Safety (EHS) department and still others through Human Resources. No matter where the responsibility lives, it is important that a driving force exists at the corporate level to maintain the linkage between the executive body and CSR practitioners and to develop programs that reflect the needs and capabilities of the total organization. In the “think global and act local” tradition, hands-on local delivery of CSR programs is often done through line functions at various business units.

7.2.2 For CSR Implementation People/Team

7.2.2.1 Planning and Implementing Change

Figure 18 – Transformational Change



When planning to adopt CSR, the project group must consider the implementation as an organizational change, and ensure the principles of change management are applied.

There are three basic types of change: developmental, transitional and

transformational (Ackerman, Anderson, 2001). For the chemical industry, the adoption of RC in

the mid-1980s was transformational, a shift in mindset that occurred after several wake-up calls and change that was necessary to avoid disaster. A graphic representation of transformational change is provided in Figure 18. Adoption of CSR along with Responsible Care on the other hand

Figure 19 – Transitional Change

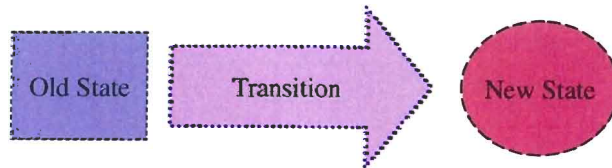


Figure by author; Information source: Ackerman, Anderson

is not such a leap. CSR requires a shift in thinking but it is a logical evolution that makes sense for an existing voluntary activity. This is a Transitional change as shown in Figure 19. Organizational

change, as any other strategic activity, has three distinct phases – the first of which is building the foundation to support the project. This has already been identified and discussed as an executive function. The second and third phases, design and implementation fall into the CSR leaders' roles and are equally critical to the success of the initiative. While each firm will use its own change model, the recommendations and best practices below address some of the critical activities that should be included in any project.

7.2.2.2 Design Phase

When planning, it is equally important to manage how to do something (designing implementation programs and management systems) as it is to decide what to do (selecting strategic direction for corporations) to ensure the outcome fits the firm's culture and structure. For example, a small firm cannot be successful at implementing programs that are resource-intensive and / or bureaucratic. Large firms with many facilities on the other hand, must avoid implementing "ad hoc" programs since they would be difficult to manage efficiently.

A strong component of program development is stakeholder input and at this stage, the CSR team should incorporate plenty of stakeholder involvement, particularly that of the employee stakeholders.

External stakeholders are those groups who see the organization from an arm's length and can develop their perspective of the company from very specific and sometimes narrow interaction points. They can sometimes have astonishingly different views about the firm than its leaders and management do, including how a firm can change and improve. Often, these stakeholders are driven by agendas and issues that don't match the ones the firm thinks are important.

Employee stakeholders view the company from the inside and can also have very divergent viewpoints from management about the firm's social initiatives. Employee opinions about the company are often driven by the extent that the firm's values, direction and actions match their own personal values. Knowing what employees feel about a company can be extremely important since employees can influence work processes at a very organic level, where small changes can produce big impacts. Getting any new program to work, particularly socially oriented ones requires commitment by all employees.

Understanding how stakeholder perceptions develop and how they affect a company's relationship with stakeholders is crucial to developing the social programs that address the real concerns that exist internally and externally.

A follow up to stakeholder input, is stakeholder communication planning. Good, consistent and relevant communication is key and will be discussed as part of the implementation process recommendations, but planning for communication must be done up front. To whom, how, and when communication takes place becomes a part of the project plan.

It is imperative to have or develop a project plan with milestones. While developing programs and metrics is important, if there is no activity plan with resources identified to carry out the tasks in an identified period, nothing will happen. Milestones serve to provide a sense of urgency for the process to stimulate diligent and consistent effort on the part of the team. Again, as for any other project, significant achievement milestones must be identified and specific amounts of work, time, and resources must be accurately allocated to achieve them. The project plan represents a blueprint for whom, how and when the work of CSR implementation is done. Regular review of the plan clearly and quickly identifies obstacles or gaps in it that the CSR group must address before they impede the project. Measuring progress against the planned schedule will identify whether allocated resources are sufficient in size and capability to manage tasks. Achieving milestones provides opportunities for celebration, another very important part of making any project work.

Once appropriate programs and systems are identified and planned, the CSR team should develop appropriate metrics. These metrics must be SMART; Specific, Measurable, Achievable, Relevant and Timely. Metrics development should be done early, before any of the programs are actually launched. These metrics must specify what should be measured – that is, what aspects is the program targeting for attention and improvement, such as, environmental issues like water use, waste generation or recycling programs. Social issue metrics can involve more targeted philanthropy, attaining better diversity in the workplace, doing better at retaining or developing employees or improving purchasing processes. Important to the value of the metrics is that they make sense to both the firm and its stakeholders. The metrics should also identify how and when the measurement must occur. Should measurement be daily, monthly or annually? Should it be an absolute figure, such as how many tonnes of paper were recycled last year, or should it be relative, such as what percentage reduction in employee turnover was achieved. Finally, the metrics need to include targets. Targets provide a measure of success and a goal that can be met

and celebrated. The target provides the incentive and the prize to be attained that can stimulate commitment and competition for achievement. In the beginning, targets should be relatively easy, in order to present opportunities for easy wins, which facilitates participation. As time goes on, these targets can become more difficult to spur innovation and continual improvement. SMART metrics for the chemical industry could be reductions in greenhouse gas emissions per tonne of product manufactured measured on an annual basis. This metric meets all of the criteria of specific, measurable, achievable, relevant (particularly now that Kyoto has been ratified) and timely. Other metrics could include energy or other raw materials consumption.

7.2.2.3 Implementation Phase

Executive education must occur early in the implementation phase of the process. The team should design and deliver CSR education to the top layers of leadership within your organization. While chemical industry executives have “bought in” to the idea and ethic of Responsible Care, there is still a considerable “belief gap” (Whalen, 2004) within corporate executive groups about the business value of socially-focused voluntary initiatives, even within organizations who have adopted and are considered to be CSR leaders . Often, CSR champions do not have sufficient internal resources or authority to ensure that CSR issues are consistently on the business agenda or that they get the attention of line management, particularly in difficult business climates. Through appropriate and consistent education, delivered over time, a firm can modify its mindset and paradigm with respect to CSR and make it an accepted “way to do business” in the company. Once accepted and embedded within management, CSR easily trickles downward into the employee population.

Stakeholder (including employees) education follows executive education. While this program may not need to be as detailed conceptually as the one for executives, it must be more focused on

areas such as activity, expectations and outcomes. Stakeholders need to know what they can expect from the process, and what the process expects from them.

If there is a single most important recommendation for implementation of CSR it is to communicate, communicate, communicate. Communication is a different process than education with the distinction being that education produces some form of learning, while communication is the process of sharing information. Communication also introduces the notion of two-way interaction, rather than one-way. In implementing any change, process or project, particularly one that involves social and stakeholder issues, a project group cannot over-communicate.

Stakeholders need and want timely and accurate information to know what is going on, measure the level of commitment to the process and voice thoughts and concerns. Effective internal communication increases participation and commitment within the groups that are expected to deliver task-based actions. Effective external communication develops credibility and recognition for the work the firm is doing. Both communication streams provide valuable opportunities to implement course corrections and improvements to the process.

A cautionary note with respect to communication, particularly when referring to performance metrics, is to avoid over-promising or any hint of “greenwashing.” This is a term used by environmentalists and other CSR critics to characterize moves that foster a positive public image for unsound or merely acceptable environmental or social practices (Wikipedia, 2005). Firms must be very careful to develop sound CSR messages that are accurate, timely, relevant and consistently delivered. Good messaging includes emphasis on awareness of issues, identifying successes of business partners, sharing lessons learned, and using common or accepted reporting tools.

CSR implementation teams do not need to do this work alone, nor should they try. There are literally thousands of sources for information on CSR, hundreds of firms who are implementing it, and dozens of organizations who provide support for and develop CSR tools. Several sets of guidance documents that provide a CSR roadmap and standardized metrics also exist, such as the Global Reporting Initiative (GRI), that can help a company develop their own program. Benchmarking against other firms and using other programs as basic models will speed up the process. Adding your firm's own specifics will shape a program and management system to fit your unique firm and put you firmly on the path to social responsibility.

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APPENDICES

Appendix 1

Origin and Description of Selected Voluntary Initiatives

Natural Step

Natural Step was founded in 1989 in Sweden, by Dr. Karl-Henrik Robèrt, one of Sweden's leading cancer researchers, who saw firsthand the link between environmental contaminants and human health.

Natural Step (TNS) is an international non-profit organization that uses a science-based, systems framework to help organizations, individuals and communities take steps towards sustainability. Dr. Robert set out to define the guiding principles for a sustainable society. www.naturalstep.org

Equator Principles

The International Finance Corporation convened a meeting of banks in London in October 2002, where a banking industry framework for addressing environmental and social risks in project financing was drafted. These are the Equator Principles.

A framework for financial institutions to manage environmental and social issues in project financing. www.equator-principles.com

Sustainable Development

Developed through the work of the UN World Commission on Environment and Development chaired by Dr. Gro Harlem Brundtland.

A term first coined in the report "Our Common Future" and defined as "That which meets the needs of the present without compromising the ability of future generations to meet their own needs." www.iisd.org

Triple Bottom Line

The phrase was coined by John Elkington, co-founder of the business consultancy SustainAbility, in his 1998 book 'Cannibals with Forks: the Triple Bottom Line of 21st Century Business'.

Broadly, the triple bottom line encompasses the range of values that organizations must embrace - economic, environmental and social. Practically, triple bottom line accounting means expanding the traditional reporting regimes to take into account financial, environmental and social performance. www.tbli.org; www.bsdglobal.com

Corporate Citizenship

When Leon Sullivan joined the Board of Directors at General Motors in 1971, he used his corporate foothold to oppose apartheid, the government policy of segregation in South Africa. Since the passage of a Declaration of Grand Apartheid in 1948, a number of reformers, including Nelson Mandela, had tried unsuccessfully to end apartheid. General Motors was the largest employer of blacks in South Africa at that time, and Sullivan decided to use his position on the Board of Directors to apply economic pressure to end the unjust system. The result was the Sullivan Principles, which became the blueprint for ending apartheid.

A set of principles that were developed in 1977 to address social injustice, particularly that of racism in the workplace. www.revleonsullivan.org/principled/principles.htm

CERES Principles

Ceres was formed in 1989 as a partnership between leading environmental groups and institutional investors seeking ways to align investment dollars with social and environmental responsibility. Ceres emerged just as the Exxon Valdez oil spill in Alaska led the environmental and investor communities to push for higher standards of corporate responsibility and environmental and social sustainability.

The Ceres Principles are a 10-point code of corporate environmental conduct, a pioneering effort that led to widespread adoption of environmental principles by numerous companies. In 1997, Ceres launched the Global Reporting Initiative (GRI), an international standard for corporate reporting on the "triple bottom line" of economic, social and environmental performance.

www.ceres.org

Appendix 2

Appendix 2 - Chemical Industry Incidents 1950 to 1990

Year	Location	Incident type	Description
1989	Pasadena, USA	vapour cloud explosion	A chemical release at a polyethylene plant resulted in a flammable vapour explosion resulting in 23 fatalities and 300 injuries.
1987	Texas City, USA	toxic gas release	An industrial accident damaged a hydrogen fluoride (HF) storage tank, causing a release of vapour. There were no fatalities but there were over 1000 medical treatments required and evacuation of 4000 people. Extensive environmental damage occurred.
1987	Grangemouth, UK	explosion and fire	Explosion and fire on low pressure separator, resulting in \$100 million damage. No fatalities reported.
1984	Mexico City, Mexico	explosion and fire	Explosion and fire at an LPG (liquefied petroleum gas) at a terminal caused 500 fatalities, hundreds of other injuries and evacuation.
1984	Bhopal, India	toxics	Explosion at Union Carbide pesticide plant in Bhopal India released a cloud of methyl isocyanate, killing at least 2,000 and leaving many more injured or disabled.
1982	Salford, UK	warehouse fire and explosion	A fire in a warehouse containing sodium chlorate caused an explosion that resulted in 60 injuries and evacuation of several hundred people.
1982	Missouri, USA	chemical waste	In 1996-97, 265,354 tons of soil and other dioxin-contaminated material from Times Beach and 26 other sites in eastern Missouri had been incinerated. In 1982, Times Beach's 2,242 residents were evacuated after dioxin found in soil.
1981	Stalybridge, UK	explosion and fire	Explosion of hexane solvent at a small recovery plant killed one person and severely injured another.
1977	New York, USA	chemical waste	Hooker Chemical Company used an incomplete canal for dumping waste by-products. Once filled, the land was covered and sold to the Niagara Falls city school board and a school and subdivision of homes was built on top. Chemicals were detected leaking out of the site in 1977 and residents were eventually evacuated.

Appendix 2 - Chemical Industry Incidents 1950 to 1990

1976	Mill Woods, Canada	chemical pipeline failure	Pipeline failure caused a release of boiling propane. Incident resulted in no injuries but required evacuation of 19,000 people.
1976	Seveso, Italy	toxic vapour release	A release of vapour from a chemical reactor contained TCCD (2,3,7,8-tetrachlorodibenzo-p-dioxin) While no fatalities resulted, the incident is thought to have caused many subsequent illnesses and pregnancy/birth problems.
1975	Beek, UK	vapour cloud explosion	Compressed propane gas from a naphtha cracker was released. The subsequent explosion and fires killed 14 people and injured 107 others (3 offsite).
1974	Flixborough, UK	explosion	Explosion of cyclohexane vapour cloud at the Nypro (UK) site severely damaged, 28 workers killed and 36 more severely wounded. Offsite injuries numbered 53.
1974	Chicago, USA	toxic gas release	Release of silicon tetrachloride and hydrogen chloride resulted in 1 fatality, 160 injuries and evacuation of 16,000 people for 20 days.
1966	Fayzin, France	bleve	A leak in a propane sphere caught fire, resulting in a BLEVE (boiling liquid, expanding vapour explosion), that killed 18 and injured 81.

Source: UK Government, Health and Safety Executive,
Available online <http://hse.gov.uk/comah/sragtech/casestudyind.htm>

Appendix 3

Example worksheets for Calculating the Value of CSR, Source: Willard, 2003

ASSUMPTIONS ABOUT CSR COMPANY

(Data and assumptions based on 2003 operating year)

Revenue (millions)	\$1,000
Profit (millions)	\$10
Employee Population	1,000
Employees	800
Managers	200
Average Employee Salary	\$50,000
Average Manager Salary	\$100,000

In the following worksheets, assumptions used in the calculations which are not obviously explicit are shown with this notation:

(Assumption: ...)

Most cells are calculated internally, but all are changeable.

The cells with the most critical assumptions are highlighted.

EDUCATION INVESTMENT REQUIRED TO ACHIEVE BENEFITS		
Costs for One Day of Education for the Whole Company		
Cost to develop and deliver the education		\$300,000
(Assumption: Whole company receives the education	1,000	
times the cost to develop and deliver one day)	\$300	
Cost of lost productivity of an employee while on course		
(Assumption: Annual salary / 365	\$137	\$109,589
times the number of employees)	800	
Cost of lost productivity of a manager while on course		
(Assumption: Annual salary / 365	\$274	\$54,795
times the number of managers)	200	
Total cost of one day of education for the whole company		\$464,384
Annual Cost of Sustainability Education		
Year 1		\$928,767
Year 2		\$464,384
Year 3		\$464,384
Year 4		\$464,384
Year 5		\$464,384
Cost of 5-year investment in sustainability education		\$2,786,301
NPV of 5-year investment in education		\$2,394,250
(Assumption: Internal cost of money)	6%	

ATTRACTING AND HIRING THE BEST TALENT

Cost of Recruiting a New Person

External advertising or internal job posting cost		\$5,000
Candidate screening costs		\$500
Interviewing costs ... preparation, interviews, follow-up		\$1,420
(Assumption: Hours spent on interviewing activity)	30	
Offer and hiring costs		\$500

Total cost of recruiting a new person		\$7,420
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Savings on Recruiting Costs

Normal cost of recruiting each new hire		\$7,420
x Number of new hires per year		100
(Assumption: Percent of company workforce hired)	10%	
Total Recruiting Costs		\$742,045
x Percent that will be attracted by sustainability image	20%	
x Percent reduction in recruiting costs for those attracted by company's sustainability image	5%	

Annual savings on RECRUITING costs		\$7,420
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Percent savings in Recruiting Costs		1%
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RETAINING THE BEST TALENT

Assumptions Used To Estimate the Cost of Losing a Good Person

The person's years of service with the company	5 years
"Decide Time" while the person, privately, decides to leave	1 month
"Save Attempt Time" while management tries to save the good person	0.5 months
"Vacant Time" when the position is vacant	2 months
"New Hire Training Time" for the new hire, by the company	0.5 months
"Department Training Time" for the new person	6 months
Monthly cost of an employee	\$4,167
Monthly cost of a manager	\$8,333

Cost of Losing of a Good Person

Person's lost productivity during Decide Time		\$2,083
(Assumption: Person's percent lost productivity during Decide Time)	50%	
Managerial lost productivity during Save Attempt Time		\$1,042
(Assumption: Manager's percent lost productivity during Decide Time)	25%	
Person's lost productivity during Save Attempt Time		\$1,042
(Assumption: Person's percent lost productivity during Save Attempt Time)	50%	
Payroll and benefits administration		\$379
(Assumption: Equivalent days of an employee's time)	2	
Separation allowance		\$11,458
(Assumption: Number of weeks' pay)	11	
Lost knowledge, experience, and contacts		\$45,000
(Assumption: Percent of salary for 1st year employed	50%	
plus additional percent for each subsequent year)	10%	
Lost training invested in the employee		\$10,500
(Assumption: Number of days for 1st year employed	15	
plus additional days for each subsequent year)	5	
Lost customer revenue during Vacant Time		\$83,333
(Assumption: Person's share of monthly company revenue	\$83,333	
times Vacant Time	2	
divided by credibility factor)	2	
Lost department productivity during Save Attempt and Vacant Times		\$5,208
(Assumption: Percent of productivity lost by others	10%	
times number of others affected)	5	
Lost productivity in back-filling person's own work during Vacant Time		\$2,083
(Assumption: Percent of productivity lost by back-filling person)	25%	
Lost productivity of manager during Vacant Time		\$1,667
(Assumption: Percent of productivity lost by manager)	10%	
Lost productivity in person's job during Vacant Time		\$4,167
(Assumption: Percent of productivity lost, despite help from others)	50%	
Savings of person's salary while job is vacant		-\$8,333

Total cost of loss of a good person		\$159,629
Total cost of recruiting a new person		\$7,420 See Hiring
Cost of On-Boarding and Training a New Hire		
Setting up personnel records, system ids, etc.		\$189
(Assumption: Equivalent days of an employee's time)	1	
New hire training - Cost to company to deliver it		\$2,100
(Assumption: Cost per day of training	\$300	
times number of days of company training)	7	
New hire's own lost productivity during new hire training		\$2,083
(Assumption: Percent of productivity lost)	100%	
Lost productivity of back-filling person's work during new hire training		\$521
(Assumption: Percent of productivity lost)	25%	
Lost productivity of manager during new hire training		\$417
(Assumption: Percent of productivity lost)	10%	
Lost productivity in person's job during new hire training		\$1,042
(Assumption: Percent of productivity lost)	50%	
Cost to deliver formal department training		\$1,500
(Assumption: Cost per day of training	\$300	
times number of days of department training)	5	
New hire's own lost productivity during formal department training		\$947
(Assumption: Percent of productivity lost)	100%	
Lost productivity of back-filling person during formal department training		\$237
(Assumption: Percent of productivity lost)	25%	
Lost productivity of manager during formal department training		\$95
(Assumption: Percent of productivity lost)	10%	
Lost productivity in person's job during formal department training		\$473
(Assumption: Percent of productivity lost)	50%	
Buddy's lost productivity in own work during informal training		\$2,500
(Assumption: Percent of productivity lost	10%	
times number of months of informal training)	6	
Employee's lost productivity during informal training		\$12,500
(Assumption: Percent of productivity lost	50%	
times number of months of informal training)	6	
Total cost of on-boarding and training a new hire		\$24,604
Cost of Losing and Replacing One Good Employee		
Total cost of loss of a good person		\$159,629
Total cost of recruiting a new person		\$7,420
Total cost of on-boarding and training a new hire		\$24,604
Cost of losing & replacing one good employee		\$191,653
Number of employees who leave each year		100
(Assumption: Percent of employee population who leave)	10%	
x Number of good employees lost each year		30
(Assumption: Percent of employees who leave whom we want to retain)	30%	
Annual cost of losing and replacing good employees		\$5,749,591
x Percent of these who would not leave if they were attracted to the company's sustainability initiatives	the company's sustainability initiatives	20%
Annual savings from higher RETENTION rate		\$1,149,918
Overall cost of attrition		19,165,303
Percent savings of overall cost of attrition		6%

INCREASED PRODUCTIVITY

Increased Productivity of Individual Employees

Total number of employees	1,000
x Percent who will be energized by the company's sustainability initiatives	10%
x Percent increased productivity from their increased commitment	15%
x Average employee's annual salary	\$50,000

Benefit of increased productivity from INDIVIDUALS	\$750,000
Number of full-time equivalent (FTE) employees	15

Increased Productivity from Improved Teamwork Among Departments

Total number of employees	1,000
x Percent increased productivity from interdepartmental teamwork	5%
x Average employee's annual salary	\$50,000

Benefit of increased productivity from improved TEAMWORK	\$2,500,000
Number of full-time equivalent (FTE) employees	50

Increased Productivity from Improved Working Conditions

Total number of employees	1,000
x Percent of employees whose working conditions are improved	40%
x Percent increased productivity from improved working conditions	5%
x Average employee's annual salary	\$50,000

Benefit of increased productivity from improved WORKING CONDITIONS	\$1,000,000
Number of full-time equivalent (FTE) employees	20

Total Benefit of Increased PRODUCTIVITY ...

Benefit of increased productivity from INDIVIDUALS	\$750,000
Benefit of increased productivity from improved TEAMWORK	\$2,500,000
Benefit of increased productivity from improved WORKING CONDITIONS	\$1,000,000

Annual benefit of increased PRODUCTIVITY	\$4,250,000
Number of full-time equivalent (FTE) employees	85

REDUCED MANUFACTURING EXPENSES

Simple, Macro-level Calculation

Hardware revenue		\$250,000,000
(Assumption: Hardware percent of total revenue)	25%	
Hardware costs		\$25,000,000
(Assumption: Costs as a percent of hardware revenue)	10%	
Sustainability savings in manufacturing costs		\$1,250,000
(Assumption: Percent of hardware costs saved)	5%	
- Savings reinvested in other environmental projects		\$625,000
(Assumption: Percent of savings reinvested)	50%	
<hr/>		
Annual benefit in MANUFACTURING costs		\$625,000
Benefit expressed as a percent of hardware revenue		0.25%
Benefit expressed as a percent of overall revenue		0.06%

Checklist For a More Detailed Calculation

Savings from eco-friendly MATERIAL SUBSTITUTIONS

Materials with smaller "ecological rucksacks"; recycled materials;
non-hazardous materials; process redesign

+ Savings from eco-friendly ENERGY SUBSTITUTIONS

Renewable wind and solar energy; in-house generation; fuel cells;
mini-generators powered by heat from manufacturing processes; process redesign

+ Savings from MATERIAL REDUCTIONS

Handling savings; zero-waste process redesign

+ Savings from ENERGY REDUCTIONS

Insulation; energy-efficient light fixtures; energy-efficient pumps; thicker,
straighter, energy-efficient pipe systems; whole systems thinking when
purchasing plumbing and electrical contracts and bids; thicker electrical
wires; energy-efficient transformers; increasing off-peak electrical usage;
off-the-grid process redesign; plus other energy reduction measures
listed in the Reduced Expenses at Commercial Sites worksheet

+ Savings from WATER REDUCTIONS

Recycling and treating wastewater; closed loop, zero-waste process redesign

+ Savings from REDUCING, REUSING, RECYCLING SCRAP MATERIAL

Hazardous waste reduction and elimination; non-hazardous waste reduction,
sorting, and elimination; industrial ecology with other companies;
zero-waste process redesign

+ Savings from REUSING/RECYCLING RETURNED PRODUCTS

Reuse of products, components, and raw materials; design for disassembly;
leasing; selling services instead of products; cradle-to-cradle redesign

+ Savings from LESS PACKAGING

+ Savings from more EFFICIENT TRANSPORTATION of products

More eco-friendly mode of transportation; lighter packaging; batching loads;
more efficient routing

+ Savings from FASTER APPROVAL CYCLES

R&D savings; development savings; health and safety savings

Total savings from reduced manufacturing expenses

REDUCED EXPENSES AT COMMERCIAL SITES

Simple, Macro-level Calculation

Selling, general, and administrative (SG&A) expenses		\$100,000,000
(Assumption: SG&A percent of total revenue)	10%	
Energy, water, and consumables costs		\$5,000,000
(Assumption: Costs as a percent of SG&A expenses)	5%	
Savings in COMMERCIAL SITE operating costs		\$1,000,000
(Assumption: Percent of SG&A expenses saved)	20%	
Benefit expressed as a percent of overall revenue		0.10%

Checklist For a More Detailed Calculation

Savings on EMPLOYEE DISCRETIONARY CONSUMABLES

Paper savings from duplexed printing and copying; office supply savings; other employee suggestions

+ Savings from improved WASTE HANDLING

More sorting at source; composting; cafeteria waste to pig farmers

+ Savings from ENERGY EFFICIENCIES through retrofits

Super-windows; on-site power generation; sunlight; occupancy sensors; eco-efficient right-sized fan and HVAC systems; insulation; task lighting; energy-efficient appliances, office equipment, and lighting fixtures; passive solar heating; plus other measures listed in the Reduced Manufacturing Expenses worksheet

+ Savings from ENERGY EFFICIENCIES in the design of new buildings

All the above; revenue from selling excess energy back to the grid; plus eco-design ideas from multiple stakeholder consultations

+ Savings from EMPLOYEE STEWARDSHIP

Reductions through increased awareness of consumption; using stairs instead of elevators; turning off lights and equipment when not in use

+ Savings from WATER CONSERVATION

Low-flow toilets and plumbing fixtures; closed-loop water treatment using Living Machine approaches

+ Savings from LOWER LANDSCAPING COSTS

Naturalized landscapes; less/no watering or fertilizing; planting trees to offset greenhouse gases from business travel

+ Savings from REDUCED OFFICE SPACE

Telecommuting; e-mail; fewer people because of higher productivity

+ Savings from less BUSINESS TRAVEL

Videoconferencing; teleconferencing

Total savings from reduced expenses at commercial sites

INCREASED REVENUE AND MARKET SHARE

Simple, Macro-level Calculation

Total revenue today		\$1,000,000,000
Potential revenue increase because of sustainability initiatives	5%	
Increased REVENUE from sustainability initiatives		\$50,000,000
Increased PROFIT from sustainability initiatives		\$1,000,000
<i>(Assumption: Percent of today's revenue that flows to profit)</i>	2%	

Checklist For a More Detailed Calculation

- Percent of increased mind share of "green" consumers
 - x Percent of historic markets share increase per percent of mind share
 - x Percent of historic revenue per percent of market share
-

Increased revenue from new "green" customers

- + Increased revenue from more loyal customers
 - + Increased revenue from new markets
 - + Increased revenue from services through dematerialization and leasing
 - + Increased revenue from environmental services
-

Total increased new revenue

REDUCED RISK

Simple, Macro-level Calculation

Total revenue today		\$1,000,000,000
Selling, general, and administrative (SG&A) expenses (Assumption: SG&A percent of total revenue)	5%	\$45,000,000
Part of SG&A expenses associated with risk (Assumption: Percent of risk-related SG&A expenses)	5%	\$2,250,000
Expense reductions from REDUCED RISKS (Assumption: Percent of risk-related SG&A expenses saved)	5%	\$112,500
Benefit expressed as a percent of overall revenue		0.01%

Methodology For a More Detailed, Scenario-based Calculation

Based on a scenario methodology described in
Pure Profit: The Financial Implications of Environmental Performance
 by Robert Repetto and Duncan Austin in a report for the World Resources Institute, 2000.

Step 1: Identify salient future issues

- o Identify future environmental, social, and economic forces that are likely to have significant financial impact on the company within the time frame of the assessment (e.g., the next 10 years).
- o Consult experts from government agencies, industry, environmental and social activist groups, consultants, and scientists.
- o Research published literature.
- o Use a matrix of the forces for change (e.g., market prices and availability, regulations, changes to taxes and subsidies, liabilities, and other risks outlined earlier) and the stages of the product cycle (e.g., supply of raw material, manufacturing process, product output, post-consumer take-back) to identify the key value drivers over the range of the product cycle.

Step 2: Build scenarios around each

- o Define the range of plausible outcomes associated with each issue.
- o Develop two to three scenarios for each issue.

Step 3: Assign probabilities to each scenario

- o Especially do this for the best- and worst-case scenarios.

Step 4: Assess company exposure to these issues

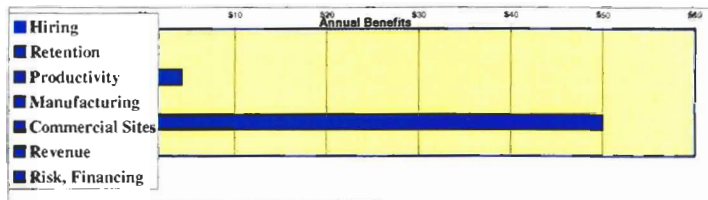
- o Have industry or company experts rank each issue based on the magnitude of its potential impact on earnings, its timing (the sooner it happens, the greater its impact), and its probability.

Step 5: Estimate financial impacts contingent on the scenarios

- o For the forecast period, first build baseline financial forecasts using industry and company trends. Use a valuation technique (e.g., McKinsey's entity discounted cash flow model or Stern Stewart's Economic Value Added model) to equate the value of the company to the sum of the discounted present values of all its separate cost, revenue, investment, and financing streams.
- o Then, for each scenario, quantify the outcomes in terms that can be used in a financial analysis (e.g., impact on prices, production costs, revenues, expenditures, investments required, and balance sheet liabilities) for each year in the forecast period. If appropriate, do this for individual company locations.
- o Reduce these year-by-year amounts to discounted present values using an estimate of the weighted average cost of capital.
- o Add these present values to obtain the net financial impact for the combined scenarios, and express this as a percentage of the company's current market valuation.

TOTAL BOTTOM-LINE BENEFIT

Totals from Seven Benefit Areas	Annual Savings and Increased Revenue	Annual Profit Increase
Annual savings on RECRUITING costs	\$7,420	\$7,420
Annual savings from higher RETENTION rate	\$1,149,918	\$1,149,918
Annual benefit of increased PRODUCTIVITY	\$4,250,000	\$4,250,000
Annual benefit in MANUFACTURING costs	\$1,250,000	\$625,000
Savings in COMMERCIAL SITE operating costs	\$1,000,000	\$1,000,000
Increased REVENUE, and resulting PROFIT	\$50,000,000	\$1,000,000
Expense reductions from REDUCED RISKS	\$112,500	\$112,500
TOTAL	\$57,769,839	\$8,144,839
Percent of previous year's revenue & profits	6%	81%
(Assumption: Revenue & profit in previous year)	\$1,000,000,000	\$10,000,000



Benefits Obtained Over Five Years	% of Benefit	Gross Benefit	- Education Investment	Net Benefit	IRR on Educ'n Invest't
Year 1	30%	\$17,330,952	\$928,767	\$16,402,184	1766%
Year 2	50%	\$28,884,919	\$464,384	\$28,420,536	6120%
Year 3	70%	\$40,438,887	\$464,384	\$39,974,503	8608%
Year 4	90%	\$51,992,855	\$464,384	\$51,528,471	11096%
Year 5	100%	\$57,769,839	\$464,384	\$57,305,455	12340%
Total net benefit over 5 years				\$193,631,150	
NPV of 5-year investment in education				\$157,968,644	
(Assumption: Internal cost of money)	6%				

DERIVATION OF "SD Inc." ASSUMPTIONS

Source: FORTUNE 500 web site at <http://www.fortune.com/fortune/fortune500/ind8.html> for 1999

	FORTUNE 500 Revenues Ranking	1999 Revenue US \$ millions	% Change From 1998	1999 Profit US \$ millions	% Change From 1998	1999 Employees Number	% Change From 1998	1998 Revenue	1998 Profit	1998 Employees
Computers, Office Equipment										
Intl. Business Machines (IBM)	6	87,548	7%	7,712	22%	307,401	6%	81,821	6,321	290,001
Hewlett-Packard (HP)	13	48,253	3%	3,491	19%	84,400	-32%	46,848	2,934	124,118
Compaq Computer	20	38,525	24%	569	0%	76,100	-5%	31,069	569	80,105
Dell Computer	56	25,265	38%	1,666	14%	36,500	50%	18,308	1,461	24,333
Xerox	87	19,228	-4%	1,424	261%	94,600	2%	20,029	394	92,745
Total		218,819	10%	14,862	27%	599,001	-2%	198,074	11,680	611,302
Average of top 5 companies		43,764	10%	2,972	27%	119,800	-2%	39,615	2,336	122,260

The above data is used as the basis for the assumptions for the hypothetical "SD Inc." company used in sample calculations in the worksheets.
The following data about the rest of the top 10 "Computer & Office Equipment" companies is for information purposes only.

Sun Microsystems	150	11,726	20%	1,031	35%	29,700	13%	11,703	1,027	29,661
Gateway 2000	203	8,646	16%	428	24%	20,726	9%	8,632	427	20,707
NCR	283	6,196	-5%	337	176%	32,800	-1%	6,199	331	32,803
Apple Computer	285	6,134	3%	601	94%	8,348	2%	6,132	595	8,346
Pitney Bowes	354	4,548	5%	636	10%	30,628	-2%	4,546	635	30,634
Total of top 10		256,069	9%	17,895	22%	721,203	-2%	235,286	14,696	733,455
Average of top 10		25,607	9%	1,790	22%	72,120	-2%	23,529	1,470	73,345
SD Inc. as a % of Top 10		85%		83%		83%		84%	79%	83%

Appendix 4

CCPA Responsible Care Code Elements

CODE	CODE SECTION	CODE ELEMENT
ALL	General	Need to audit
CAER	General	Site manager has primary responsibility
CAER	General	Program meets or exceeds letter and spirit of all applicable laws
CAER	General	Training and assessment in place to ensure employee competence in CAER
CAER	General	Work to assist public policy in CAER
CAER	Awareness	2.1 Identify community interest representatives
CAER	Awareness	2.2 Identify community rights, concerns, etc.
CAER	Awareness	2.3 Develop community communication information
CAER	Awareness	2.4 Regularly communicate with the community
CAER	Awareness	2.5 Identify and train company communicators
CAER	Awareness	2.6 Assess program activities and results
CAER	Response	3.1 Is based on assessment of risks to site and community
CAER	Response	3.2 Provides information on hazards/risks to those with interest
CAER	Response	3.3 Addresses emergencies and community response
CAER	Response	3.4 Is developed/communicated jointly with officials & media
CAER	Response	3.5 Is integrated with community plan
CAER	Response	3.6 Plan is communicated regularly to community
CAER	Response	3.7 Makes company resources available to community
CAER	Response	3.8 Addresses assistance to dislocated persons
CAER	Response	3.9 Has been tested at least annually with community
R&D	General	Responsibilities assigned for generating, implementing, auditing, updating, acting
R&D	General	Policies, protocols, methodologies meet or exceed letter and spirit of laws
R&D	General	Hiring, training, assessment standards/procedures in place
R&D	General	Security procedures and systems in place
R&D	General	Work to assist public policy in R&D
R&D	General	CAER Code and Manu Code 3 apply to R&D sites
R&D	Project Approval	2.1 Protocols in place for hazard evaluation & procedure definition
R&D	Project Approval	2.2 Require periodic reviews vs. standards to dictate project continuance
R&D	Project Approval	2.3 Require hazard analysis prior to new applications and during work
R&D	Project Approval	2.4 In-house sites and outside labs evaluated for compliance with above
R&D	Lab Practice	3 Audit and update on a regular basis
R&D	Lab Practice	3.1 General lab health and safety
R&D	Lab Practice	3.2 Regular employee training, education in hazards
R&D	Lab Practice	3.2 Hazard identification/communication and employee

CODE	CODE SECTION	CODE ELEMENT
		training
R&D	Lab Practice	3.3 Proper management of lab waste
R&D	Lab Practice	3.4 Results documentation in accurate and ethical manner
R&D	Lab Practice	3.5 Hazard data packages for new chemicals, processes, applications
R&D	Trans. to Manuf.	4.1 HAZOP'S, or equivalent, integral part of design process
R&D	Trans. to Manuf.	4.2 SH&E standards & responsibilities clearly spelled out
R&D	Trans. to Manuf.	4.3 Requires operator pre-start-up and emergency training
R&D	Trans. to Manuf.	4.4 MSDS's, handling/disposal procedures required for all materials
R&D	Trans. to Manuf.	4.5 Principles apply to pilot and small scale plants
R&D	Market Intro.	5.1 All laws are met or exceeded
R&D	Market Intro.	5.2 Employees and contractors are trained in product handling
R&D	Market Intro.	5.3 Customers are provided with hazard/waste information and assistance
R&D	Market Intro.	5.4 Confirm customers handling/using/disposing products responsibly
R&D	Market Intro.	5.5 Ensure above in place before introduction (even test marketing)
MANU	General	Responsibilities assigned for generating, implementing, auditing, updating, acting
MANU	General	Policies, standards, procedures meet or exceed letter and spirit of laws
MANU	General	Hiring, training, assessment standards/procedures in place
MANU	General	Due diligence applied to toll manufacturers, and hazard information supplied
MANU	General	Due diligence applied to contractor performance
MANU	General	Work to assist public policy in manufacturing
MANU	Protection	2.1 Hazard and risk assessment and minimization done
MANU	Protection	2.2 Health and safety monitoring and problem ID/minimization processes in place
MANU	Protection	2.3 Site emergency plan prepared
MANU	Protection	2.4 Hazard/risk information to on/off site people - respond to concerns
MANU	Protection	2.5 Aware of effluents and emissions - plans in place to handle spills/emissions
MANU	Protection	2.6 Process for minimization and environmentally sound management of wastes
MANU	Protection	2.7 Assessment of environmental impact of closure/demolition and protection
MANU	Design/Constr'n	3.1 Hazard/risk assessment/minimization procedures for design of facilities

CODE	CODE SECTION	CODE ELEMENT
MANU	Design/Constr'n	3.2 Criteria set for site selection to minimize impacts
MANU	Design/Constr'n	3.3 Criteria set for buffer zones for new and existing sites
MANU	Design/Constr'n	3.4 Closure/demolition impact minimization included in design stage
MANU	Design/Constr'n	3.5 Construction/start-up safety standards In place
MANU	Design/Constr'n	3.6 Information on new facilities to community and respond to concerns
MANU	Operations	4.1 Hazard/risk assessment/minimization procedures for operating facilities
MANU	Operations	4.2 Written, current operating, start-up and shutdown procedures
MANU	Operations	4.3 Written, current maintenance procedures to protect people
MANU	Operations	4.4 Explosion, fire, release protection in place
MANU	Operations	4.5 System in place to manage changes to processes, equipment, etc.
MANU	Operations	4.6 Security procedures and systems in place
MANU	Operations	4.7 SH&E procedures in place for material handling and storage
MANU	Operations	4.8 Process in place for regular audits and updates of above
TRANS	General	Responsibilities defined for generating, implementing, auditing, updating, acting
TRANS	General	Policies, standards, procedures meet or exceed letter and spirit of laws
TRANS	General	Hazard and risk evaluation and communications processes in place
TRANS	General	Work to assist public policy in transportation
TRANS	Accident Prev'n	2.1 Establishes criteria for mode, equipment, container selection & maintenance
TRANS	Accident Prev'n	2.2 Establishes criteria for carrier selection/assistance (CCPA program or equal)
TRANS	Accident Prev'n	2.3 Identifies routes to minimize risk
TRANS	Accident Prev'n	2.4 Establishes standards for loading/unloading equip't and emerg. response
TRANS	Accident Prev'n	2.5 Provides procedures, training, assessment of loading/unloading persons
TRANS	Accident Prev'n	2.6 Deals with risks in container return, cleaning, reuse, servicing, disposal
TRANS	Accident Prev'n	2.7 Clearly identifies the contents of containers
TRANS	Accident Prev'n	2.8 Provides for regular audits and updating of above
TRANS	Response	3.1 Identifies and deals with hazards and release containment and cleanup
TRANS	Response	3.2 Identifies resources to be deployed
TRANS	Response	3.3 Provides technical advisors for informational needs, including media
TRANS	Response	3.4 Provides equipment and materials
TRANS	Response	3.5 Train, assess company emergency responders

CODE	CODE SECTION	CODE ELEMENT
TRANS	Response	3.6 Provides first responder training (contact established & packages distributed)
TRANS	Response	3.7 Provides for cooperation with agencies at scene
TRANS	Response	3.8 Provides for evaluation of need for dislocated persons assistance
TRANS	Response	3.9 Provides for regular audits and updating of above
TRANS	Awareness	4.1 Key elements to reduce hazards, prevent accidents and respond
TRANS	Awareness	4.2 Information on hazards and risks of materials moving along corridors
TRANS	Awareness	4.3 Identification and training of employees to answer questions
TRANS	Awareness	4.4 Participate in industry and carrier program to raise awareness of transportation
TRANS	Awareness	4.5 Periodic assessment and updating of program
DIST	General	Responsibilities defined for generating, implementing, auditing, updating, acting
DIST	General	Policies, standards, procedures meet or exceed letter and spirit of laws
DIST	Risk Management	2.1 Identify/evaluate hazards/risks in storage/handling at owned/contracted sites
DIST	Risk Management	2.2 Monitor S&H performance and workplace to identify and minimize problems
DIST	Risk Management	2.3 Meet requirements of CAER code
DIST	Risk Management	2.4 Establish standards for siting and security of distribution facilities
DIST	Risk Management	2.5 Establish written standards for bulk and packaged storage
DIST	Risk Management	2.6 Provide own/contracted employees with hazard and risk information/training
DIST	Risk Management	2.7 Provide emergency support consistent with CAER and Transportation codes
DIST	Risk Management	2.8 Establish process for auditing and updating above
DIST	Communication	3.1 Obtain, understand, provide customers with MSDS's for initial shipments
DIST	Communication	3.2 Provide waste and empty container management information
DIST	Communication	3.3 Provide H&S information to customers and through them to end users
DIST	Communication	3.4 meet foregoing prior to introduction of new products
DIST	Legal	4.1 Meet or exceed letter and spirit of laws
DIST	Legal	4.2 communicate with and train employees and contractor employees to comply
DIST	Participation	5.1 Choose organizations, etc. for Responsible Care advocacy
DIST	Participation	5.2 Raise community groups' awareness of distribution

CODE	CODE SECTION	CODE ELEMENT
		improvements
DIST	Participation	5.3 Inform own/contracted employees on distribution standards and advocacy
DIST	Participation	5.4 Influence, with stakeholders, public policy to reflect changing environment
DIST	Distributors	6.1 Defines a distributor policy which establishes minimum standards
DIST	Distributors	6.2.1 Establishing distributor selection criteria based on codes
DIST	Distributors	6.2.2 Assessing distributor performance against criteria
DIST	Distributors	6.2.3 Taking follow-up action to correct shortcomings or terminate supply
DIST	Distributors	6.3 Ensures distributors understand expectations, principles, codes of Resp. Care
DIST	Distributors	6.4 Responds to information/assistance requests
DIST	Suppliers	7.1 Defines supplier policy which establishes applicable areas of code (Canada)
DIST	Suppliers	7.2.1 Establishing supplier selection criteria based on code
DIST	Suppliers	7.2.2 Assessing supplier performance against criteria
DIST	Suppliers	7.2.3 Taking follow-up action to correct shortcomings or terminate purchase
WASTE	General	Responsibilities defined for generating, implementing, auditing, updating, acting
WASTE	General	Policies, standards, procedures meet or exceed letter and spirit of laws
WASTE	General	Apply this code to all wastes considered, but not necessarily legally, hazardous
WASTE	General	Continually evaluate improved waste management and disposal technology
WASTE	General	Participate in developing improved technology and treatment/disposal facilities
WASTE	General	Apply intent of code to non-hazardous waste
WASTE	General	Work to assist public policy in waste management
WASTE	Avoid/Recover	2.1 Consider waste management needs at R&D, design and modification stages
WASTE	Avoid/Recover	2.2 Continually identify sources, to eliminate, reduce, reuse, recycle or recover
WASTE	Management	3.1 Identify, classify, maintain records of wastes and treatment/disposal methods
WASTE	Management	3.2 Require waste to be destroyed or treated to protect people and environment
WASTE	Management	3.3 Reject dilution where commercially available treatment exists
WASTE	Management	3.4 Reject long term storage where commercially available treatment exists
WASTE	Management	3.5 Require permanently hazardous wastes to be contained safely
WASTE	Management	3.6 Apply Manu. code to waste facility design, construction,

CODE	CODE SECTION	CODE ELEMENT
		operation and closure
WASTE	Management	3.7 Ensure transportation of wastes conforms to Transportation code
WASTE	Management	3.8 Define criteria for selection and use, and assess waste contractors/facilities
WASTE	Management	3.9 Require waste contractors, internationally, to have permits and apply code
WASTE	Management	3.10 Maintain employee and contractor hazard communication program
WASTE	Management	3.11 Provide waste management information and advice to customers/end-users
WASTE	Management	3.12 Advocate customers apply code; require they do so for special requirements
WASTE	Management	3.13 Require periodic assessment of practices, procedures and facilities
WASTE	Historical Practice	4.1 Develop and maintain records to identify nature and quantities of wastes sent
WASTE	Historical Practice	4.2 Conduct environmental studies to the extent practicable at each site
WASTE	Historical Practice	4.3 Notify agencies of pertinent information and results of studies
WASTE	Historical Practice	4.4 Cooperate with agencies in required remediation activities

Appendix 5

Company Name	RC	100% CDN	Parent / Owner	Parent Country	# of Cdn Emp	CSR/ SD Cdn	CSR/ SD parent	Foreign Exports	# World EMP	Comment
Akzo Nobel Chemicals Ltd.	1	0	AKZO NOBEL NV	Netherlands	250	2	3	1	61,500	www.akzonobel.com
Apotex Pharmachem Inc.	1	1		Canada	240	1	-	1	240	www.apotexpharmachem.com www.brantfordchemicals.com
Arkema Canada Inc.	1	0	Total Fina Elf / Arkema Group	US	78	1	1	1	19,300	www.arkemagroup.com
Ashland Canada Corp.	1	0	Ashland Inc.	US	100	1	2	1	21,200	www.ashland.com www.ashcem.com
Basell Canada Inc.	1	0	Basell	Netherlands	100	0	0	1	6655	www.basell.com
BASF Canada Inc.	1	0	BASF AG	Germany	600	1	3	1	82,000	www.basf.com/basf-canada
BP Canada Chemical Company	1	0	BP	UK	1500	3	3	1	#####	www.bp.com
Chemtrade Logistics Inc.	1	1		Canada	257	0	-	0	350	www.chemtradelogistics.com
Chinook Global Limited	1	1		Canada	178	2	-	1	178	www.chinookgroup.com
Ciba Specialty Chemicals Canada Inc.	1	0	Ciba Specialty Chemicals	Switzerland	100	0	2	1	19,300	www.cibase.com
Cognis Canada Corporation	1	0	Cognis GMBH	Germany	130	2	2	1	8,059	www.cognis.com
Crompton Co. (Chemtura)	1	0	Chemtura	US	500	0	0	1	4,800	www.cromptoncorp.com
CyPlus Canada Inc.	1	0	CyPlus GMBH ? Degussa	Germany	100	1	3	1	45,000	www.mycyplus.com/wps1/portal www.degussa.com
Cytec Canada Inc.	1	0	Cytec Industries	US	100	2	2	1	4500	www.cytech.com
Degussa Canada Inc.	1	0	Degussa	Germany	275	1	3	1	45,000	www.degussa.com
DELMAR CHEMICALS INC.	1	0	Consortium	Luxembourg	80	0	0	1	80	www.delmarchem.com
DOMTAR INC. - Windsor Mill	1	1		Canada	7000	3	-	1	12,500	www.domtar.com
Dow Chemical Canada Inc.	1	0	Dow Chemical Company	US	2000	3	3	1	43,000	www.dow.com
E.I. du Pont Canada Company	1	0	DuPont (Wilmington DE)	US	3400	3	3	1	60,000	www.can.dupont.com
Eka Chemicals Canada Inc.	1	0	EKA Chemicals AB - bus unit of AKZO Nobel	Sweden	200	1	1	1	3070 EKA 61,500 AK	www.eka.com www.clo2.com
ERCO Worldwide	1	1	Div'n of Superior Plus Inc.	Canada	410	0	0	1	1700	www.ercoworldwide.com
Ethyl Canada Inc.	1	0	Ethyl Corporation / Newmarket	US	100	0	0	1	1135	www.ethyl.com
Fielding Chemical Technologies Inc.	1	1		Canada	80	1	1	0	80	www.fieldchem.com
FMC of Canada Limited	1	0	FMC Corporation	US	100	2	2	1	5000	www.fmc.com
H.L. Blachford Ltd.	1	1		Canada	175	1	-	1	175	www.blachford.ca
HERCULES CANADA INC.	1	0	Hercules Inc.	US	200	0	0	1	4950	www.herc.com
Honeywell International Inc.	1	0	Honeywell International Inc.	US	100	1	1	1	#####	www.honeywell.com
Huntsman Chemical Company of Canada Inc.	1	0	Huntsman Corporation	US	50	0	0	1	11,300	www.huntsman.com

Huntsman Corporation Canada Inc.	1	0	Huntsman Corporation	US	100	0	0	1	11,300	www.huntsman.com
Imperial Oil, Products & Chemicals Division Interquisa Canada s.e.c.	1	1	Imperial Oil Interquisa & CEPSA	Canada	1000	3	3	1	6170	www.imperialoil.ca
JemPak Canada Inc.	1	1		Canada	100	0	-	0	100	www.cepsa.com
Jungbunzlauer Canada Inc.	1	0	Jungbunzlauer	Switzerland	60	0	0	1	1000	www.jungbunzlauer.com
KRONOS Canada Inc.	1	0	Kronos Worldwid a further subsidiary of NL Industries	Germany	400	0	0	1	2450	www.kronostio2.com
LPM Technologies	1	0	Ciba Specialty Chemicals	Switzerland	100	0	2	1	19,300	www.cibasc.com
MARSULEX Inc.	1	1		Canada	115	0	-	1	186	www.torquest.com
MEGlobal Canada Inc.	1	0	Dow / Petrochemicna Industries (Kuwait) JV	US	200	0	2	1	43,000	www.dow.com
METHANEX CORPORATION	1	1		Canada	220	1	-	1	900	www.methanex.com
Nacan Products Limited	1	0	National Starch and Chemical	US	325	0	1		9500	www.nationalstarch.com
Nalco Canada Co.	1	0	Nalco	US	400	0	1	1	10,000	www.nalco.com
National Silicates Limited	1	0	PQ Corporation	US	89	1	1	1	1600	www.pqcorp.com
Nexen Inc.	1	1	Nexen	Canada	1757	2	3	1	3200	www.nexenchemicals.com
NorFalcon Sales Ltd.	1	1	Noranda / Falconbridge JV	Canada	100	2	3	1	16,000	www.noranda.com
NOVA Chemicals Corporation	1	1		Canada	2300	2	2	1	4115	www.novachem.com
OMG Belleville Limited	1	0	OM Group (Cleveland)	US	100	0	0	1	1400	www.omei.com
PCI Chemicals Canada Company	1	0	Pioneer Chemicals	US	100	0	0	0	100	
PETRESA CANADA INC.	1	0	CEPSA and SGF	Spain	70	1	1	1	9500	www.cepsa.com
Pétromont Inc.	1	1	Dow / Ethylec Inc.	Canada	450	1	2	1	43,000	www.dow.com
PPG Canada Inc.	1	0	PPG Industries	US	1750	0	2	1	32,000	www.ppg.com
Procter & Gamble Inc.	1	0	Procter and Gamble	US	2900	2	2	1	98,000	www.pg.com
Raylo Chemicals	1	0	Degussa	Germany	220	1	3	1	45,000	www.degussa.com
Reagens Canada Ltd.	1	1	Royal Group Technologies	Canada	110	1	1	1	9000	www.royalgrouptech.com
Recochem Inc.	1	1	-	Canada	150	1	-	1	150	www.recochem.com
Rhodia Canada Inc.	1	0	Rhodia Group	France	100	1	3	1	20,600	www.rhodia.com
Rohm and Haas Canada Inc.	1	0	Rohm and Haas	US	100	2	3	1	17,000	www.rohmhaas.com
RohMax Canada Inc.	1	0	Degussa	Germany	33	1	3	1	45,000	www.degussa.com
Schenectady Canada Ltd.	1	0	Schenectady International	US	50	0	2	1	1000	www.siiigroup.com
Shell Chemicals Canada Ltd.	1	0	Royal Dutch / Shell Group - Shell Chemical Ltd.	Netherlands	200	0	3	1	#####	www.shellchemicals.com
Solutia Canada Inc.	1	0	Solutia Inc. (USA)	US	75	0	0	1	9000	www.solutia.com
Stelco Inc.	1	1	-	Canada	7800	0	-	1	7798	www.stelco.com
Stepan Canada Inc.	1	0	Stepan Chemicals	US	75	0	0	1	1500	www.stepan.com
St-Jean PhotoChemicals Inc.	1	0	Produits Chimiques Auxiliaires et de Synthese (PCAS) (France)	France	50	0	1	1	1418	www.pcas.fr/eme/
Sulco Chemicals Limited (Canada Colors)	1	1	Private, Canadian	Canada	20	0	-	1	20	www.sulcochemicals.com
Torcan Chemical Ltd.	1	0	Avecia	UK	125	0	0	1	1000	www.avecia.com
VFT Inc.	1	0	Rütgers Chemicals AG	Germany	65	1	2	1	2000	www.ruetgers-chemicals.de