

## **CORPORATE SOCIAL RESPONSIBILITY AND GLOBAL STANDARDIZATION: SUSTAINABLE ENVIRONMENTAL MANAGEMENT IN THE CHEMICAL INDUSTRY**

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***Abstract.** Corporate social responsibility and sustainable development are issues that been in the forefront of corporate strategy for several decades. The increase in the power of environmental groups, the ease of cross border information flow, and the rising concern of the public with regards to global impact of environmental issues are motivating factors resulting in the establishment of environmental management systems. Many multinational chemical companies, threatened with the possibility of the establishment of new, stricter, environmental laws, are actively working to demonstrate their corporate social responsibility while operating in a global market with regards to developing and implementing voluntary programs to handle the increasingly important issues surrounding environmental responsibility and global sustainability. The integration of the environmental management system into the corporate vision, mission and strategic plan is demonstrated with the ultimate goal of changing corporate culture in the companies which have the power to affect international environmental policies.*

**Keywords:** chemical industry, corporate social responsibility, environmental management system, global sustainability.

### **1. Introduction**

Corporate social responsibility and sustainable development are issues that been in the forefront of corporate strategy for several decades. Without an ideological system or a system of values, it is impossible to elaborate or make substantial or reasonable decisions. The increase in the power of environmental groups, the ease of cross border information flow, and the rising concern of the public with regards to global impact of environmental issues are motivating factors resulting in the establishment of environmental management systems. Because of the complexity of the existing regulatory laws, many multinational chemical companies, threatened with the possibility of the establishment of new, stricter, environmental laws, are actively working to demonstrate their chemical manufacturers face while operating in a global market with regards to developing and implementing voluntary programs to handle the increasingly important issues surrounding environmental responsibility and global sustainability.

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More than half of the acid deposition in eastern Canada originates from emissions in the United States. In 1995, the estimated transboundary flow of sulfur dioxide from the United States to Canada was between 3.5 and 4.2 millions of tons per year ([www.ec.gc.ca](http://www.ec.gc.ca)). The situation has shown little improvement as in 2000 as a reported 11.2 million tons of sulfur dioxide crossed the United State's border into Canada ([dev.sites1.miuupdate.com](http://dev.sites1.miuupdate.com)). Demographic information from Ontario, Canada indicates that of the \$9.6 billion spent in health and environmental damages each year attributable to ground level ozone and fine particulate matter, 55% is due to pollution traveling from the United States (Transboundary Air Pollution, 2005). Harvesting in the rain forests in South America results in a reduction of the ozone layer and increases in the cancer rate worldwide. From 1850 to 1990, deforestation worldwide (including the United States) released 122 billion metric tons of carbon into the atmosphere, with the current rate being approximately 1.6 billion metric tons per year (Urquhart, Chomenstowski, Skole and Barber, 2004). The resulting carbon dioxide in the atmosphere enhances the greenhouse effect, and potentially contributes to an increase in global temperatures. Environmental issues can no longer be considered a domestic problem.

The economic worth of the world production of chemical products has surpassed \$1.6 trillion, with over 30% being traded internationally, employing more than 7 million people ([www.icca-chem.org](http://www.icca-chem.org), 2008). Globally, the chemical industry has been subjected to increasing public concern related to the perceived adverse affects of chemicals on health and the environment. Advances in communication technology and the ease of cross boundary information flow has resulted in the creation of informed stakeholders who want to know more about associated risks of handling and transporting chemicals. Public expectations concerning reduced emissions, waste reduction, and avoidance of negative environmental impact are high. International chemical companies have a long history of grappling with balancing profits, regulations, and image.

The last 20 years of environmental legislation have resulted in the development of industry regulations that are not only difficult to comply with, but are also very costly. In 2000, compliance with the environmental rules cost businesses in excess of \$450 billion in the United States (McDowall, 2001). From 2000 – 2005, the electric utilities in the United States spent more than \$24 billion to be in compliance with federal environmental laws, not including state and local laws, and expect to pay another \$40 billion in the next decade (Edison Electric Institute, 2006). Compliance with regulatory laws now involves every phase of a product life cycle, referred to as responsibility from „cradle to cradle.” (Responsible Care Progress Report, 2007). While 70% of more than 200 corporate general counsels said that investment in environmentally sound practices and products will improve long-term profitability, corporate lawyers say full compliance is impossible (Full Compliance Impossible, 1993). Even though adherence with many of these regulations has resulted in a reduction of emission and environmental accidents, there currently is no worldwide agreement on which environmental management system to use. The following section discusses the reaction of the chemical industry to growing demands relating to environmental issues and long term sustainability.

## **2. Developing a voluntary environmental management strategy**

The ethical debate continues concerning the use of government imposed regulations versus voluntary measures. Industry is beginning to look at the impact that the growing environmental movement will have on the bottom line. Governmental regulations are ineffective motivators for producing long term productive changes in environmental performance for several reasons. First of all, environmental issues are defined and regulated in terms of the by-products produced during the manufacturing processes resulting in an “end of the pipe” response (Harrison, 1998). Companies adopted pollution control where mandated but made no changes in the finished products and processes for manufacturing. Secondly, prevention strategies have to be tailored to meet specific company needs and vary from country to country, as the legal restrictions dictate (Harrison, 1998). Finally, environmental regulations developed with no input from the affected companies foster adversarial relationships between regulators and those impacted by them (Harrison, 1998). Thornton, Gunningham and Kagan (2005) found that firms are motivated by a combination of fear legal and social sanctions and duty. Noncompliance, leading to negative publicity may alienate the firm’s stakeholders, resulting in reduced market share and closer monitoring by environmental groups (Thornton, Gunningham and Kagan, 2005).

Recent developments have been interpreted as an important movement, demonstrating the fact that the environment is a key issue in business today (James, Ghobadian, Viney and Lui, 1999, Zutshi and Sohal, 2005, Darnall, 2006). An important impetus driving the movement is that environmental activists are moving into the political mainstream in most industrialized and many developing nations (Little, 1991). As the public becomes aware of the potential impact of the industry’s output, companies are pressured to respond. Another driver exists because of the complexity of the existing regulatory laws. Many multinational chemical companies, threatened with the possibility of the establishment of new, stricter, environmental laws, are actively working to demonstrate their ability to comply with environmental initiatives voluntarily. Table 1 lists some of the advantages and disadvantages of the utilization of voluntary chemical management systems.

*Table 1*

### **Advantages and disadvantages of voluntary systems**

<b>Advantages</b>	<b>Disadvantages</b>
Take advantage of industry's expertise to reduce environmental impact Development of networks and possibility of technology transfer to other countries	Industry controls the extent of regulation leading to corruption Potential for the large corporation to create barriers to entry for smaller companies who cannot afford the infrastructure necessary to support the voluntary initiative

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Advantages	Disadvantages
Flexibility fosters creativity and innovativeness.	Possibility for many companies to cooperate to resist control of select environmental issues
Firms have „buy in“ and therefore are more likely to comply	Free riderships...companies who claim to be supporting environmental initiative but are not
Foster relationship between governments and industry	Too easy to negotiate compromises
Encourage integration of environmental issues into business decisions	Policy evaluation difficult
Less costly	Measurements of degree of compliance and environmental benefits difficult

There was a fear within the chemical industry that because the public held such a negative perception of the entire industry, the result would be seen as negative abatement costs as companies sought to build new facilities. Unless something was done to improve public opinion, firms would find it increasingly costly and difficult to build and operate new plants. As a result of media attention and the efficiency in which information is disseminated, society is beginning to interact directly with the private sector. Therefore, the greening of global corporations can be partially attributed to improvements in communication channels.

Petrochemical companies were asked to place external factors in order of importance as they relate to environmental management programs. The top rated factor was legal requirements, second was a tie between possibility of prosecution and adherence to industry standards, followed by the demands of customers and social pressure (James, Ghobadian, Viney & Lui, 1999). The threat of legal retribution and market based pressure from stakeholders have been shown to be significant motivators for the adoption of environmental management systems for several Fortune 500 companies, especially those that are visible in the eyes of the consumer (Anton, Deltas and Khanna, 2004). The results of this survey indicate that there are few altruistic reasons for developing environmental programs. While trying to display an image of caring, chemical companies are realizing that the development of an environmental management program is becoming more important as potential legislation is developed. Many of the businesses that are proactive are acting in hope of achieving a business advantage (James, Ghobadian, Viney and Lui, 1999).

Another reason for adopting a cooperative approach for environmental programs is to meet various political agendas. A government may support voluntary compliance because it does not have the resources to enforce strict legal regulations, or may be hesitant in developing legislation because it does not want to impose the extra cost on a large corporation who may be considering locating within its jurisdiction (Harrison, 1998).

### **3. Creating shareholder value**

There are recommendations for creating value in the literature (Reinhardt, 1999). Although written for domestic markets, they all apply to international business. Most suggestions emphasize the following: create methods to differentiate product lines to focus on „environmentally friendly” products, be the first to work with foreign governments to create barriers to entry, redesign wasteful procedures, and persuade suppliers to be compliant.

For many years large chemical corporations have been developing programs domestically for assuring environmental compliance. The international members of the American Chemistry Council (ACC), actively doing business abroad, have been able to persuade their foreign counterparts to begin building their own environmental initiatives, especially in developing countries. Structural capital includes management relationships, organization structure, renewal and development. An intelligent organization, whose most valuable asset is the intellectual capital, should foster each of these components, in order to mobilize them well. (Bratianu, Vasilache et al, 2006) The natural progression of development is to take the knowledge developed domestically and market it abroad, tailoring an environmental management program to meet the evolving needs of the developing country in which the company is operating. The worldwide market for environmental goods and services was expected to grow rapidly during the next decade.” (Ember, 1992). Business opportunities often are disguised as environmental challenges. Shrewd executives will watch for changes in individual and societal needs for environmental quality as the industry works towards sustainability. Market opportunities will appear and businesses will be called upon to provide eco-efficient goods and services.

The challenge of maintaining a commitment to shareholder value while balancing environmental responsibilities requires a thorough understanding of all of the surrounding issues that impact both objectives. There are two overriding strategic components that provide the motivation for implementing the international environmental program. The first is to establish and maintain a positive corporate image, especially in those countries which already have established environmental responsibility regulations and place value on having the programs in place. The second is to return shareholder value. This is accomplished through an integrated business strategy. The foundation of the entire program lies with the leadership and commitment of upper management. All the employees, based on the example of upper management, must adopt this commitment. Once the corporate image becomes the basis of the corporate culture, then the business plan must be developed. Business decisions and the evolution of strategic direction have to be made with considerations of environmental impact. In international business the relationships between governments and regulators become even more difficult to sort out.

#### 4. Alternative compliance standards

There are many voluntary environmental systems being used globally. The goal is to develop an agreed upon worldwide set of standards for implementation and measurements and present it in a language each stakeholder understands. Reaching a consensus among chemical producers representing almost every nation in the world on issues concerning what to measure and how to measure is paramount in successfully implementing environmental programs. The North American contingency prefers to use the set of principles referred to as Responsible Care. Originally adapted by the members of the Chemical Manufacturers Association (now the American Chemical Council, ACC) and the Canadian Chemical Producers Association, Responsible Care has become an international initiative, labeled as the chemical industry's strategy for survival (Nash and Ehrenfeld, 1996). The program consists of ten fundamental core principles and seven management practice codes as illustrated in Table 2.

Table 2

##### Guiding principles of responsible care

To recognize and respond to community concerns about chemicals and our operations	To extend knowledge by conducting or reporting research on the health, safety and environmental effects of our products, processes and waste materials
To develop and produce chemicals that can be manufactured, transported, used and disposed of safely	To operate our plants and facilities in a manner that protects the environment and the health and safety of our employees and the public
To make health, safety and environmental considerations a priority in our planning for all existing and new products and processes	To work with others to resolve problems created by past handling and disposal of hazardous substances
To report promptly to officials, employees, customers and the public, information on chemical-related health or environmental hazards and to recommend protective measures	To participate with government and others in creating responsible laws, regulations and standards to safeguard the community, workplace and environment
To counsel customers on the safe use, transportation and disposal of chemical products	To promote the principles and practices of Responsible Care by sharing experiences and offering assistance to others who produce, handle, use, transport or dispose of chemicals

One of the primary goals of Responsible Care is to establish a partnership with the surrounding community (Responsible Care to the rescue, 1998). Corporations inform the community surrounding their manufacturing sites, about the products and processes used to manufacture them, making all emissions data public. Forming this partnership is a crucial step required in order to accomplish the second goal, which is to improve the industry's environmental performance and communication between itself, customers, surrounding community and society. The program has been accepted and promoted within industry in North America and Europe and is now expanding into the

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Far East. According to the International Council of Chemical Associations (ICCA), in the late 1990's, Responsible Care was adopted in 40 countries, accounting for 86% of the global chemical production (Global Green Standards, 1996). The American Chemistry Council's major contributing members are comprised of 14 multinational companies including as Dupont, Monsanto, Dow, Merck, ExxonMobil, ChevronTexaco and Shell.

In Europe, of the several systems, there are two that are prominent, the European Union's Eco-Management and Audit Scheme (EMAS) and International Organization for Standardization (ISO) 14001 (Matthews, Christini and Henderson, 2004). As of the December, 2003, more than 60,000 certifications for ISO 14001 in 128 countries, ranging from over one thousand in Japan to one in Sudan ([www.inem.org](http://www.inem.org)). A technical committee within the International Organization for Standardization, which represents 111 countries and 95% of the world's industrial output, developed the ISO 14000 series of standards (Thayer, 1996). ISO 14000 focuses on the integration of environmental systems while outlining the necessary components for an environmental management system. ISO 14010 through 14012 focus on the measurement and internal auditing systems (Casio, 1996). Table 3 lists the various components of ISO 14000.

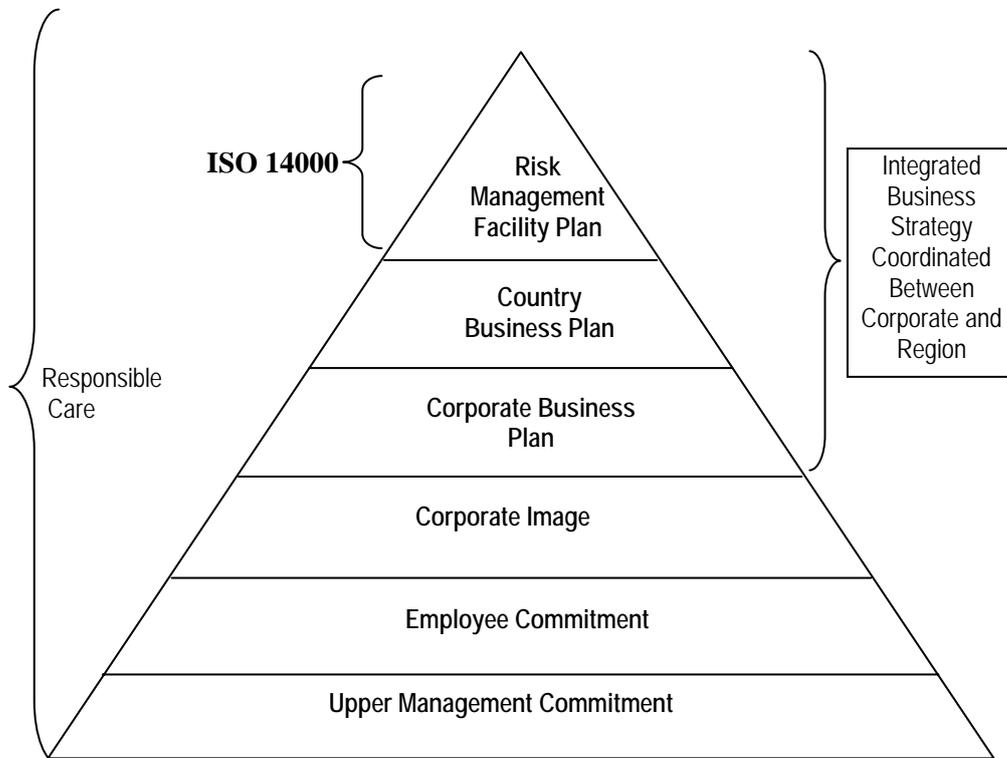
*Table 3*

### **ISO 14000 Environmental management systems guidelines**

ISO 14001	Guidance for Use
ISO 14010-12	Audit Procedures
ISO 14014	Guidelines for Environmental Reviews
ISO 14015	Guidelines for Environmental Site Assessments
ISO 14031	Methods for assessing environmental performance
ISO 14041-44	Impact and Improvement Assessments
ISO 14020-24	Labeling

This system is concerned with having the proper processes in place to provide measurable results. It does not dictate what or how to take measurements (Thayer, 1996). These details are left to the individual manufacturer, as the requirements will change depending on the type of chemicals produced. It is predicted that ISO 14000 will follow the same path as ISO 9000 and eventually become a condition of doing business internationally ([www.icca-chem.org](http://www.icca-chem.org)).

The Responsible Care initiative has established a set of codes and rules governing conduct. The members of the ACC have established deadlines for demonstrating the implementation of each of their codes. A superficial analysis might lead one to believe that the two systems are competing, Responsible Care being the North American approach and ISO 14000, the European choice. The two are actually complementary and can be utilized to develop a comprehensive environmental management system. Figure 1 provides an illustration of the components of establishing an environmental management system and where Responsible Care and ISO 14000 fit in relation to the overall corporate business strategy.



**Figure 1. Components of International Environmental Focus**

Responsible Care is process based. It takes into account the corporate philosophy of environmental accountability. There are guidelines that focus on community involvement and product stewardship. The major criticism of the initiative is that measurement requirements are not detailed and it is not prescriptive enough concerning actual implementation guidelines. It is rather soft and fuzzy concerning the „hard” data requirements that are absent in the Guiding Principles and Codes of Practice. The importance of the principles and codes are that they provide the foundation for establishing the processes for further development of the necessary programs to begin implementation of a data based program as represented by ISO 14000. This is especially important to a multinational corporation dealing with environmental regulations that differ from one country to another. Responsible Care establishes and demonstrates the overall commitment to environmental stewardship. It is also a corporate-wide standard in that it addresses product development and the impact that new chemicals will have on the environment during their developmental period in research and development. Once Responsible Care is implemented on a global basis, each operating facility is free to implement a more specific management program,

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such as ISO 14000, in manner that fits the operational level of the country in which they are operating. The environmental assessments, such as waste and emission tracking and measurements of improvements in performance become the facility's responsibility. An example of how these initiatives complement each other is illustrated when dealing with labeling issues. Responsible Care's guidelines set the theme through advocating knowledge and reporting of information concerning chemicals to the community and customers. Each country has regulations detailing labeling of containers of chemicals. ISO 14020 – 14024 covers the terms and definitions for labeling, environmental labeling symbols and testing and verification methodologies.

A global system would consist of the combination of Responsible Care at the corporate level and ISO 14000 at the facility level. This would allow for global consistency with the flexibility of meeting specific country guidelines. The benefits of an international global standard for management of environmental issues would include the standardization of registrations, labeling, inspections and regulations, resulting in lower costs to operate internationally and less confusion when selling products in different countries.

There are several organizations that serve to bring the community of chemical producers together. The international group that represents the largest collection of domestic organizations is called the International Council of Chemical Associations. (ICCA). This association is important because it represents the vast majority of chemical producers in industrialized nations. Executives from chemical companies represented by the regional organizations meet regularly under the umbrella of the ICCA to discuss international issues that affect their member companies ([www.icca-chem.org](http://www.icca-chem.org)). The major purpose of the organization is to represent the worldwide chemical producer's view to intergovernmental agencies such as GATT/WTO, and ISO. The ICCA is currently promoting and coordinating the international implementation of Responsible Care but is not working on a global standard for managing environmental issues at the facility level ([www.icca-chem.org](http://www.icca-chem.org)). Table 4 lists the representing organizations for different parts of the world.

*Table 4*

### **International Council of Chemical Association (ICCA) Members**

North America	South America	Japan	Australasia	South Africa	Europe	CEFIC Associate Members
ANIQ Mexico	ABIQUIM Brazil	JCIA	PACIA Australia	CAIA	CEFIC	
CCPA Canada	CIQyP Argentina		NZCIC New Zealand		FCIO Austria	SCHP Czech Republic
ACC USA	ASIQR Uruguay				FEDICHEM Belgium	MAVESZ Hungary

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North America	South America	Japan	Australasia	South Africa	Europe	CEFIC Associate Members
	ASIQUIM Chile				FDKI Denmark	PIPC Poland
					KT RY Finland	SCHFP Slovak Republic
					UIC France	CRA Slovenia
					VCI Germany	TKSD Turkey
					HACI Greece	
					IPCMF Ireland	
					FEDERCHIMICA Italy	
					VNCI The Netherlands	
					PIL Norway	
					APEQ Portugal	
					FEIQUE Spain	
					KEMIKONTORET Sweden	
					SGCI/SSIC Switzerland	
					CIA United Kingdom	

[www.icca-chem.org](http://www.icca-chem.org)

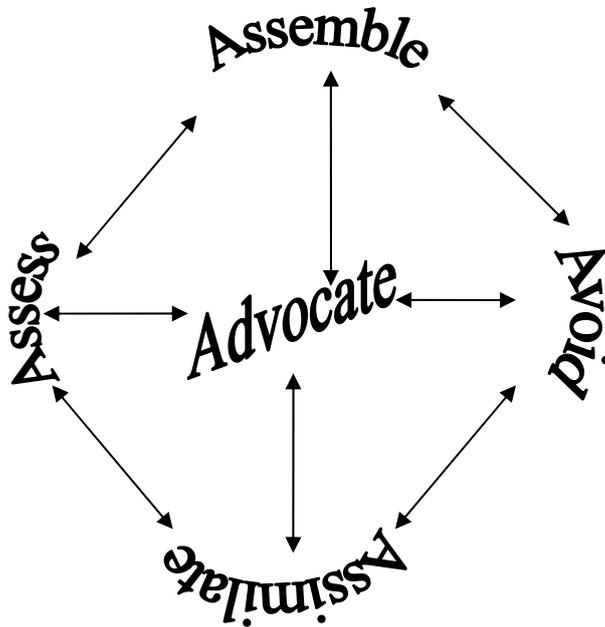
Most of the larger producers in North America are represented through the participation of the members of the ACC and the Canadian Chemical Producers Association (CPPA). Western Europe is represented by the individual country society. There is an obvious lack of representation from Eastern Europe, the Middle East and Asia. Even though there is a lack of society representation in these regions, the majority of the international producers, the leaders in the industry, are in the industrialized nations. As they expand into other areas of the world, the fact that environmental protection is integrated into the corporate culture will insure the carryover of the environmental systems into new markets. Because of the number of countries and the companies represented by the regional associations and the involvement in working

with intergovernmental agencies, the ICCA represents the most efficient forum for the development of a global environmental management system.

Similar to the 4 „P”s of marketing, there can be considered the 5 „A”s of environmental management: Assemble, Avoid, Assimilate, Assess and Advocate.

Figure 2 illustrates the flow of information needed to integrate the various aspects of an environmental management system. Examples of successful implementation of environmental programs contain the following procedural steps. The successful implementation of an environmental management system begins with the assembling of an Environmental Health and Safety division. Early in the process, the function of this group may be to monitor the company’s performance related to regulatory laws and compliance. More importantly, this group must be responsible for the education and training employees concerning their responsibilities within the corporate environmental initiative. The initiative will not be of value if all of the responsibility for environmental stewardship resides in a single division. The output, in this case, is a yearly progress report that becomes a public relations tool.

Although avoid has a negative connotation, it is important to remember to avoid infractions of the environmental laws within the country in which the company is operating. Being compliant with these laws is a mandatory requirement and is the minimum state of compliance. International corporations with environmental management systems in place meet the minimum requirements within a country and then build globally upon the strengths that have been established.



**Figure 2. Integration of Environmental Management System**

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Environmental management systems must be assimilated into the business unit's strategic plans. The corporate philosophy begins with the CEO and Board of Directors. In each of the examples, the upper management agreed upon the management system to use and then it was up to the individual business management to insure that the systems are in place and that each was educated to understand their role. Environmental care has to become part of the corporate culture. This can occur through the constant reminder of its importance by the upper management, the use of rewards for meeting established targets and creating shareholder value.

Measurements of successful performance must be taken and be made public. Some international companies measure emissions, waste generation, accidents and fines and compare against their established goals. Some measure their success with being compliant with Responsible Care or ISO 14000. In most cases the summary of performance is reported to an executive board. In Shell's case, the compensation of the facility management was based on the improvements in environmental performance measures reported to upper management. ISO 14001 provides a framework for monitoring, measuring, recording and auditing performance and compliance to the environmental goals established by the corporation.

The final piece to the puzzle is to have a program to advocate the use of the environmental management system. Part of the Responsible Care initiative focuses on the communication and relationship building with the surrounding community. The same initiative should be in place worldwide, internally, with foreign subsidiaries and externally with suppliers, customers and other companies. The large international chemical companies are well represented within the ICCA. They obviously have the power and resources to impact the initiatives that are developed within the group as well as the ability to influence the governments of the countries in which they operate. Chemical companies in the emerging countries need the help of the international firm.

## **5. Summary and Conclusion**

The worldwide trade in chemicals is very large. It will continue to grow as emerging economies develop. As a response to public awareness created by chemical accidents, the proliferation of legislation, members of the chemical industry, primarily multinational corporations, have voluntarily joined together under the ICCA to promote initiatives such as Responsible Care and ISO 14000. The action has been successful in improving the industry's image and in some cases measurable improvements in controlling emission and waste have been reported. The challenge of maintaining a commitment to shareholder value while balancing environmental responsibilities requires a change in corporate culture that must be supported and implemented from the top of the organization and then assimilated by all involved in the business.

There are two strategic components that provide the motivation for implementing the international environmental program. They are to, first, establish and maintain a positive corporate image and, second, to return shareholder value. This is accomplished through an integrated business strategy that relies upon the

implementation of Responsible Care and ISO 14000. Both are voluntary environmental initiatives, both can be used at different levels of the corporation to implement a comprehensive program. The leadership and commitment of upper management must be demonstrated at each level of the corporation.

Further investigation needs to be done on how and whether the companies represented by the ICCA are agreeing on a single standardized program of environmental management. Is there a specific timetable and is the domestic program successful in other countries? Also, information regarding the ability of medium and small size companies to meet Responsible Care or ISO 14000 guidelines, given the complexity and resources required, would be of interest. Finally research is needed in the area of implementing environmental management systems in non-production situations.

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