

## Chapter 1

# Introduction to Environmental Planning and Management

Environmental planning and management are strategic challenges confronting businesses in the 21st century. As customers and stakeholders demand that global companies lead by showing corporate citizenship, the health, safety and security of both the people and the natural environment have become a litmus test for good citizenry. Successful companies today are not only measured by how much profitable their products are but also how well they respond to the call to protect the natural environment. Global companies are increasingly recognizing that green products do not necessarily cost more but provide market niche that could help the company thrive. For example, the success stories of Kodak single-use camera and Xerox re-manufacturing programs have made businesses rethink their strategies and pay attention to environmental management.

The issues concerning the environment are not purely scientific but rely also on planning and management. They are part of corporate vision, mission, and strategy which need to be effectively planned to remain competitive. Corporate leaders are recognizing the increasing role of stakeholders and are accepting that their corporate strategies must focus not only on their customers but also on their stakeholders. Stakeholders are those whose actions or reactions have the potential to affect the firm's business operation and survival. Environmental burden is an issue that affects world citizens and they have the right to demand that corporate responsibility be properly defined to take into consideration these concerns. Today, companies are adapting their strategies in response to these concerns. World communities have reacted by adopting international and national laws to ensure compliance to environmental standards. It is also clear that green products may in fact, provide competitive advantage. Recently, there has been significant growth in the development of such products since the 1990s.

Paint companies are now producing zero-VOC (Volatile Organic Compounds) products. Glidden introduced zero-VOC paint in the US in

the mid 1990s and was followed by other major paint manufacturers such as Benjamin Moore and Sherman-Williams. Homeowners have responded very well to this development<sup>1</sup>. Today, all major paint manufacturers market zero-VOC paint and offer lower-VOC coatings for a variety of substrates. Some manufacturers such as Rodda Paint of Portland, OR; have gained Green Seal on their paint products and that has given it a competitive edge. It joins the likes of big players like Benjamin Moore.

The energy industry has also reacted to *green power* which has been defined by the National Association of Attorney Generals [NAAG] as the use of replenishable or sustainable fuel sources in the generation and transmission of electricity and the disposal of spent fuels. These releases into the environment would not create harmful substances and would pose no significant concern to the ecosystem and to land use. The focus is on renewable energy supply. Studies have shown that homeowners are willing to pay more to use green power<sup>2</sup>. This program is similar to the waste recycling program in many communities that are paid for by consumers.

The trend toward green is on the rise in every sector of the economy. According to a study by Yanklovich Clancy Schulman, 78% of people are “influenced greatly” to buy products that make environmental claims. The Organic Trading Association notes that products with the word “organic” have 34% sell-through rate compared to conventional products. Furthermore, the rate of growth of natural or organic food has been steady at 18-25% while conventional foods remain flat at 3-4%<sup>3</sup>. The demand for organic products has also affected the clothing industry where the current trend calls for the use of organic cotton.

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<sup>1</sup> Esposito, C.C., “The evolution of low- and zero-VOC paint,”  
<http://www.coatingsworld.com/May041.htm>

<sup>2</sup> PriceWaterHouseCoopers, “The Pitfalls and Potential of Marketing Green Power,” Fall 1999 edition of Public Utility Topics,  
<http://www.pwcglobal.com/extweb/indissue.nsf/DocID/45CDA2C5CCA82EE98525689B00732FC5>

<sup>3</sup> Fassa, L., “The Trend Toward Green,”  
<http://www.babyshopmagazine.com/fall02/green.htm>

The growth of “*conspicuous conservation*” is also on the rise as the demand for hybrid vehicles skyrocket<sup>4</sup>. Companies like Toyota and Honda that were among the first to manufacture hybrid cars that combine gas engines with battery-powered electric motors have witnessed surge in demand. These products are not only environmentally friendly but are also economical. Aside from the fact that these hybrid cars cut emissions, owners in the US can write off a one-time deduction of \$2,000 of the purchase price for these vehicles since the Internal Revenue Services (IRS) has recognized them as eligible for the clean-burning fuel tax deduction<sup>5</sup>. This law also applies to other vehicles that operate on natural gas, liquefied natural gas, liquefied petroleum gas, hydrogen, or any other fuel that is at least 85% alcohol. Owners of completely electric vehicles would even get tax credit of up to \$4,000. Customers who patronize these products want to be seen as saving energy and believe that their consumption behavior reflect who they are. The trend towards environmental conservation is further reflected in the emergence of energy saving products such as energy star appliances, compact fluorescent lights, photovoltaic solar cells, “high performance” homes and others.

The green trend is on the rise and green products offer a new market niche to global companies. According to The LOHAS journal, about 63 million consumers or about 30% of US adults purchase goods and services that are classified as healthy, environmentally friendly, socially conscious and sustainable<sup>6</sup>. The LOHAS index constitutes of five major areas that comprise sustainable economy, healthy living, alternative health care, personal development and ecological life style. While there are more to this index, however, environmental issues are prominent.

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<sup>4</sup> Stafford, E.R., “Conspicuous Conservation – Believing that “you are what you own,” an emerging trend exalts virtue over tawdry materialism,” <http://www.greenatworktoday.com>.

<sup>5</sup> Bell, K., “Cut emissions and your tax bill,” [http://biz.yahoo.com/brn/050309/9775\\_1.html](http://biz.yahoo.com/brn/050309/9775_1.html), March 9, 2005.

<sup>6</sup> [http://www.lohasjournal.com/nbp/app/cda/nbp\\_cda.php?command=Page&pageType=About](http://www.lohasjournal.com/nbp/app/cda/nbp_cda.php?command=Page&pageType=About)

The discussions above highlight the growing importance of environmental management systems and the need to effectively plan and manage in order to harness the values that would accrue to companies that adopt environmental strategies. We shall next look at how to assess the cost of environmental quality. It is very important that managers understand the cost side of environmental quality. Knowledge of the costs would obviously, hit home the need to be proactive and prevent environmental errors from occurring.

### **Environmental Management Systems (EMS)**

The focus of this book is on Environmental Management and Planning. Naturally, Environmental Management System (EMS) forms the core of any environmental management and planning program. EMS has become increasingly popular in the past few years mainly due to ISO 14000 series which is labeled EMS. EMS is a well structured and documented approach to respond to environmental challenges by focusing on environmental regulations and standards, and customer requirements. It is based on the need to respond proactively to the management of natural environment by conducting lifecycle assessment to lessen environmental burden and optimize the use of limited natural resources. Firms that adopt the EMS approach focus on effective ways to use such limited resources to produce environmentally conscious products and services. One of the popular approaches to achieve this is to adopt a plan-do-check (study) - act (PDCA) which was popularized by the father of Total Quality Management (TQM) Dr. Edward Deming. Using PDCA requires that the firm focuses on how to develop environmental policies by recognizing corporate, industry, local, national and international environmental policies and standards. The consideration of these policies and standards constitutes a major factor in designing a product or service for the environment.

Planning is important to any successful EMS program. A chapter in this book is devoted to the importance of planning. Effective planning leads to successful consideration of factors that may support or hamper

EMS efforts. Planning offers a way to optimization of resources and stops the firm from “*fighting fires*.” Planning leads to preventive measures and anticipation of future environmental changes. It positions the firm to take competitive advantage rather than responding only to challenges as they occur.

Effective planning also smoothens out implementation and minimizes environmental burden since many of the sources of environmental burden would be anticipated and addressed. It also helps address “*what if*” or sensitivity analysis questions. Thus, different scenarios and alternatives will be anticipated, investigated, and prototypes looked at to identify at least a *satisficing* solution that may not necessarily be optimal but give a very good resolution to the environmental problem. When products and services are designed for the environment, they are properly planned and fully tested before introduction into the marketplace. However, pushing these products and services to the market does not end the responsibility of the firm. Environmental scanning is an ongoing process that would lead to continuous review of the products and services to achieve continuous improvement.

Our approach in this book is to focus on management issues as key to the success of environmental planning program. The traditional focus of environmental systems has been on the natural sciences. While natural sciences continue to play a major role in understanding the natural environment, the problem of environmental burden or optimization of natural resources would not be achieved without a focus on how such burden or resources can be effectively managed.

This book therefore focuses on the strategic context of environmental management. It focuses on corporate strategies to develop a new vision of environmental management systems. Some of the areas that are looked into are:

- Top management commitment – Since the era of TQM, it has become apparent that most problems organizations face can be blamed on top management. Top management wields a lot of power and authority. It provides the mission and vision of the organization. It lays down organizational strategies and it

provides the resources to achieve organizational goals. If top management is not committed to a cause, it would not devote the needed resources to it. Top management must take EMS to heart for it to be successfully implemented. Employees respond to the call from their leaders. Corporate leaders have the responsibility to educate their employees and make them buy into the corporate mission. When top management views environmental management as strategic, integrate it in corporate mission and devote resources and commit time to it, others will follow. These resources would enable to provide proper training, education, and technology to address environmental burden.

- Cross-functional team – There is a need to develop cross-functional teams that would work concurrently to address environmental issues. The use of cross-functional teams is vogue in managing successful organization. It is important that members of the teams have a single view of the organization. Functional units within organizations are interdependent and should not be treated as independent silos. Members of the manufacturing unit should be able to work together with marketing and express and share views at the same time. The concurrency at the design stage helps to reduce the cycle time to introduce new products and makes the organization more competitive. The different backgrounds of team members also expose different worldviews that could be captured and used to develop an acceptable plan to all the departments.
- Stakeholder Teams – In conjunction with the cross-functional teams that may comprise mostly of organizational employees, it is important to also work with stakeholder teams. Stakeholders constitute those whose actions and reactions affect or are affected by organizational actions. As cited in the book, many organizations are today working with various interest groups to develop environmental strategies. The involvement of different stakeholder teams also helps win acceptance of final decisions that are reached.
- Responsibility for the environment: – Who is responsible for environmental management in the organization? Our response

to this question is that everyone is responsible. The approach adopted in this book is known as Total Environmental Quality Management (TEQM). Environmental management is not relegated to a particular department or to particular individuals in the organization. Instead, every member of the organization takes full responsibility for his or her own action and works hard to make sure that EMS is fully implemented. Each member of the organization seeks out ways to contribute, and identifies ways to limit pollution and minimize waste in whatever function or activity he or she is involved in.

- The bottom line – Businesses operate to maximize stockholders wealth and must pay attention to the bottom line. If an activity is not value-adding, then there is no need to continue with such an activity. In the past, many corporate leaders complained about the *high cost* of environmental management to justify inaction or disinterest. Today, things have changed. Businesses are observing that the *external cost* for environmental quality has been underestimated and that such costs significantly affect the survival of the business. In addition, they are acknowledging that being environmentally conscious is being competitive. In this book, we illustrate several case studies of companies who regained market shares because they developed successful environmental management programs. The recognition of the importance of environmental management as a competitive weapon could also explain the growing interest of companies to get environmental certifications such as ISO 14000 and the other environmental seals. Companies flout such recognition in advertisement campaigns because they understand that social consciousness influences purchasing decisions. Therefore, it pays to be green.

### **The Road to EMS**

While there is a need to develop EMS, this road is not always smooth sailing. Companies are often bewildered by the avalanche of

materials and guidelines on environmental laws. There is a need for universal standards that would overcome some of the national laws. These standards need to be simplified and designed with implementation in mind. ISO focuses on such issues. However, its guidelines still need to be trimmed to make it easier to implement.

Unfortunately many countries such as the United States are too litigious. This poses a risk to companies who would actually want to identify and rectify problems with their products and processes. There is need to protect such corporate activities as environmental auditing. With the free access to information coupled with “cradle-to-grave” responsibilities for organizational products and services, environmental auditing that detects serious environmental flaws may actually present serious problems to a firm. The government may need to wade in to encourage and protect firms that do environmental auditing to improve environmental quality.

Environmental management should be required for all businesses irrespective of size. Small and medium-sized firms may have more problems due to limited resources and may also lack the knowledge to effectively manage the environment. Government initiatives and incentives may be necessary to encourage such businesses.

Adoption of EMS does not replace sound business strategies. While it would complement the efforts, however, sound business strategies that focus on the organization’s core competencies would still be needed to survive in today’s highly competitive environment. Thus, the goal should be to include environmental management system as part of the strategic framework. Such consideration would help to ensure that

- Products and services are designed for the environment. In other words, such products and services will create minimal environmental burdens, optimize limited natural resources, and satisfy the growing needs of stakeholders for sustainable or environmentally conscious products and services.
- The firm is competitive and able to survive in its market environment. As mentioned above, auto manufacturers that produced hybrid vehicles have reaped tremendous profits while



producing green products; Kodak repositioned itself with the single-use camera; and Xerox regained market share with its re-manufacturing program.

- External cost which also affects customer goodwill is diminished. Companies today have to take a “cradle-to-grave” approach of their products. Their actions today may haunt them in later years. In addition to punitive damages, top management may still be held personally liable. It is important to be socially responsible and adopt the correct course of action now, rather than *fight fires* later. Furthermore, these costs could be further diminished by working well with stakeholder teams. This would allow several options or alternatives to be considered in the product design and development stages, reduce cost, and quicken introduction into the market. Designing for the environment becomes a competitive weapon the firm can enjoy.
- The strategic importance of EMS decisions is very high. When poor environmental decisions are made, they are irreversible and the consequences are very high. The Union Carbide plant explosion in Bhopal, India in 1984 is still a glimpse reminder of the problems of poor environmental judgment. Apart from the so many deaths, irreversible blindness, long-lasting pollution, the ensuing public condemnation and labeling of the company has for long, dented its image and made it very difficult for the firm to operate. Poor environmental decisions lead to high production costs, poor public perception, poor quality, and would ultimately starve the firm of needed cash to conduct research and development or finance new projects.

### **Environmental Action Box**

#### ***Hybrid Cars***

The history of hybrid vehicles dates back to 1665. Flemish astronomer and Jesuit priest Ferdinand Verbiest developed plans for a miniature four-wheel unmanned steam “car” for Chinese Emperor

Khang Hsi. Since then, there have been several efforts to develop efficient hybrid cars. The most successful commercial effort to this effect could be traced to 1992 when Toyota Motor Corporation outlined in its document titled "Earth Charter," plans to develop and market vehicles that will yield the lowest emission possible. By 1997, Toyota began marketing Pirus in Japan and sold nearly 18,000 cars in its first year. By 1997-1999, other big auto manufacturers including Honda, GM and Ford introduced all-electric cars and those cars were sold mostly in California where environmental protection laws are stricter due to its poor quality air. Honda released its two-door Insight in 1999 and it is considered the first hybrid car to be offered to mass market in the United States. Insight was very successful winning several awards and was rated by EPA to receive 61 miles per gallon (mpg) in city driving and 70 mpg on highway. Toyota followed suit by releasing Toyota Pirus in the year 2000. Unlike the 2-door Insight, Pirus was the first 4-door sedan sold to mass market in the United States. By 2002, Honda introduced Honda Civic Hybrid and in 2004, Toyota Pirus II won Car of the Year Awards from Motor Trend Magazine and North American Auto Show. The demand for Pirus has skyrocketed in the US with Toyota's production of this vehicle rising from 36,000 to 47,000 in the US market. There was also a six month wait to purchase the vehicle in 2004. These hybrid cars are gradually making it into the mainstream market and other car makers have joined Honda and Toyota. The US auto manufacturer Ford introduced Escape Hybrid in September 2004 as both the first American hybrid and the first SUV hybrid.

The use of hybrid cars has enormous potential to minimize the burden on the environment. We shall summarize some of the implications on the environment that could be minimized through this effort. There has been a drastic increase in the demand for motor vehicles since the 1970s. It is estimated that there are over 700 million vehicles worldwide and if the present trend continues, this number could exceed 1 billion by 2025. There are more cars than adults in the US alone, vehicles are driven more than two trillion miles annually.

Motor vehicles contribute to all kinds of environmental and health hazards. While they are necessary for transportation purposes, however, the demand and use of vehicles need to be tamed to improve environmental quality. There are alternatives that could be pursued to limit the environmental impacts of vehicles.

*Global Warming* – About 5.5 million tons of carbon is released annually by the burning of gas, coal, and oil. The consequence is that heat is trapped in the atmosphere and causes the warming of the planet, thus producing greenhouse effect. Burning of gasoline contributes to greenhouse effect. When a gallon of gasoline weighing about 6 pounds is burned, it combines with oxygen to produce about 20 pounds of carbon dioxide (CO<sub>2</sub>). With the increasing demand for motor vehicles, it is estimated that over 300 metric tons of carbon are produced by cars and light trucks every year in the US. The carbon dioxide emission from transportation constitutes more than a third of all other sources of emission. It is therefore prudent that efforts be spent on developing fuel efficient vehicles that would burn less fossil fuel or use alternative technologies to limit environmental burdens. The focus on hybrid vehicles could help achieve reduction in the volume of carbon that is generated.

The ensuing temperature fluctuations caused by Global warming could affect wildlife survival and the entire ecosystem.

In addition, carbon dioxide is the main greenhouse gas and minimizing its production could help to build a cleaner environment. The burning of fossil fuels by motor vehicles lead to the generation of several gases and pollutants which are environmentally unfriendly and unsafe to human health. We shall adapt and present some of the statistical information from *hybridcars.com* to show the significant gain of hybrid cars over conventional gas-powered vehicles. This information is presented in Table 1 below<sup>7</sup>:

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<sup>7</sup> The comparisons in Table 1 are based on 14,000 miles per year/EPA ratings.

Table 1: Comparison of Conventional and Hybrid Cars

Gas/Pollutant	Car Type	Emission	Ecological/Health Risk
<b>Carbon dioxide</b>	2004 Toyota Camry 3.0L, 6 Automatic	2004 Toyota Pirus 1.5L, 4CVT	Global warming; Severe disruption of global weather patterns.
	11,000 pounds of carbon dioxide per year	4,800 pounds of carbon dioxide per year	
<b>Carbon monoxide</b>	2004 Cadillac SRX SUV 3.6L, 6 Automatic Bin 5	330 pounds of carbon monoxide per year	Poisonous gas that attacks the central nervous system
	2005 Ford Escape Hybrid 2.3L, 4 CVT Bin 4	230 pounds of carbon monoxide per year	
<b>Nitrogen oxides</b>	2004 Volkswagen Jetta 1.9L, 4 Automatic Bin 10	49 pounds of nitrogen oxide per year	Global warming, formation of ground-level ozone, acid rain, and smog; Respiratory problems
	2004 Honda Civic Hybrid 1.3 L, 4 CVT Bin 9	17 pounds of nitrogen oxide per year	
<b>Particulate matter</b>	2004 Range Rover 4.4L, 8 Automatic Tier 1	670 grams of particulate matter per year	Consists of particles of smoke, soot and dust. Health hazard especially lungs and bloodstream.
	2005 Honda Accord Hybrid 3.0L, Automatic ULEV II	240 grams of particulate matter per year	
<b>Hydrocarbons</b>	2004 Hummer H2 6.0L, 8 Automatic HDT-Bin 11	29 pounds of hydrocarbons per year	Air toxicity, smog, lung and tissue diseases, birth defects
	2004 Honda Insight 1.0L, 3 Manual Bin 9	8 pounds of hydrocarbons per year	

In addition to gases and pollutants associated with motor vehicles, there are also the production of sulphur oxides and lead. Sulphur oxides contribute in the formation of acid rain and are potentially dangerous to children and elderly people. The production of lead is also of concern although some countries have banned the use of leaded gasoline. Lead poisoning is known to damage organs and other tissues in the body.

This table did show that a shift to hybrid vehicles could help to minimize environmental burden by improving fuel efficiency and thereby reducing the amount of pollutants that are produced. As we mentioned earlier in this chapter, some countries now give tax incentives to encourage the shift to hybrid vehicles. Even with this shift, motor vehicles in general pose major environmental hazard. There are still the issues of water pollution from runoff oil or fluids or chemicals that manage to sip into the waterways; with the increasing number of vehicles on the road, noise pollution is still a major concern; and there is concern about solid waste disposal. All these problems continue to affect both ecological and health risks. Motor vehicles need to be designed more efficiently, made lighter, and resort to alternative energy sources to reduce environmental burden. Hybrid vehicles are contributing in improving environmental quality but human conscious effort to use mass transit systems and change driving habits could even help further. Countries like the United States also offer tax incentives to commuters who use mass transit systems to commute to work.