2 The Environmental Movement

2.1 INTRODUCTION

Man's concern over the environment goes back several hundred years, but has been most noticeable since the mid-19th century. With the coming of the Industrial Revolution, the public outcries over smoke pouring out of stacks from coal-fueled factories, and, ultimately, the expansion of the petroleum industry, the "Environmental Movement" actually began to take hold long before the "Quality Movement." This chapter is primarily intended for the quality manager who may have little knowledge of the environmental arena. We will discuss some of the primary global environmental management systems (legislated or voluntary standards) that currently provide most of the impetus to the environmental management systems movement and the development of ISO 14001, as well as the current status of various national environmental programs throughout the world.

2.2 THE UNITED STATES

2.2.1 AMERICAN PETROLEUM INSTITUTE

Years before widespread environmental legislation was passed in the U.S., the petroleum industry had already recognized the importance of its role in maintaining the environment. In 1919 the American Petroleum Institute (API) was founded as a result of an awareness by the petroleum industry that a lack of standardization had been a primary contributor to the shortages experienced by industry around the turn of the century. Consisting of the petroleum and allied industries, the API has a four-fold mission, one of which is the enhancement of the environmental, health, and safety performance of the petroleum industry. With additional pressure on the oil industry coming from regulatory agencies, the API began to invest heavily in environmental stewardship. The result was in 1990 the creation of STEP — *Strategies for Today's Environmental Partnership*. STEP has become the framework for the petroleum industry to improve its environmental, health, and safety performance. This framework is built on API's Environmental, Health, and Safety Mission and Guiding Principles. It is a basic system for preventing pollution, conserving natural resources, measuring progress, promoting product stewardship, maintaining crisis readiness, addressing community concerns, working with government agencies, and reporting results to develop responsible rules to protect the environment, the public, and employees.[2] All of these principles are very similar to the ISO 14001 framework and, according to API management, have no inconsistencies with ISO 14001. Petroleum-based industries who are implementing STEP already have most of the

ISO 14001 elements in place. With this foundation in place, API is also encouraging the petroleum industry constituents (gasoline stations, refineries, drilling operations, etc.) to become registered to ISO 14001. Implementing ISO 14001 would be most advantageous to those conducting or considering conducting international business and wish to be recognized for conformance to an international environmental management system. Additionally, you will also notice the API principles to be very much a policy statement which incorporates quality principles as well.

2.2.1.1 American Petroleum Institute Environmental, Health and Safety Mission and Guiding Principles*

The members of the American Petroleum Institute are dedicated to continuous efforts to improve the compatibility of our operations with the environment while economically developing energy resources and supplying high quality products and services to consumers. We recognize our responsibility to work with the public, the government, and others to develop and to use natural resources in an environmentally sound manner while protecting the health and safety of our employees and the public. To meet these responsibilities, API members pledge to manage our businesses according to the following principles using sound science to prioritize risks and to implement cost-effective management practices:

1. To recognize and to respond to community concerns about our raw materials, products, and operations.
2. To operate our plants and facilities, and to handle our raw materials and products in a manner that protects the environment, and the safety and health of our employees and the public.
3. To make safety, health and environmental considerations a priority in our planning, and our development of new products and processes.
4. To advise promptly appropriate officials, employees, customers and the public of information on significant industry-related safety, health, and environmental hazards, and to recommend protective measures.
5. To counsel customers, transporters and others in the safe use, transportation, and disposal of our raw materials, products, and waste materials.
6. To economically develop and produce natural resources and to conserve those resources by using energy efficiently.
7. To extend knowledge by conducting or supporting research on the safety, health, and environmental effects of our raw materials, products, processes, and waste materials.
8. To commit to reduce overall emissions and waste generation.
9. To work with others to resolve problems created by handling and disposal of hazardous substances from our operations.

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10. To participate with government and others in creating responsible laws, regulations and standards to safeguard the community, workplace and environment.
11. To promote these principles and practices by sharing experiences and offering assistance to others who produce, handle, use, transport or dispose of similar raw materials, petroleum products and wastes.

2.2.2 THE ENVIRONMENTAL PROTECTION AGENCY

The environmental regulatory movement in the United States actually began several decades before the creation of the EPA and started with the Federal Insecticide, Fungicide, and Rodenticide Act in 1947 and the Air Pollution Control Act of 1955. However, it was not until the late 1960s that the government began to take more aggressive and pragmatic steps to control environmental pollution. In 1969, the U.S. Federal government passed a statute known as the National Environmental Policy Act (NEPA) which was enacted in response to a growing concern over environmental harm resulting from population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances. NEPA declares that it is the continuing policy of the federal government "to use all practicable means and measures, including financial and technical assistance, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

In the following year (1970) President Richard M. Nixon signed an executive order that consolidated several federal environmental activities into a single agency. It was at this point that the Federal Environmental Protection Agency (EPA) was born and it has been nonstop since. Although the EPA lacks a statutory charter or even an overall policy, its purpose is to "protect and enhance our environment today and for future generations to the fullest extent possible under the laws enacted by Congress. The agency's mission is to control and abate pollution in the areas of air, water, solid waste, pesticides, radiation, and toxic substances. Its mandate is to mount an integrated, coordinated attack on environmental pollution in cooperation with state and local governments."

Although the primary focus of the EPA has been regulatory compliance under major statutes (Table 2.1), rather than management systems development, it has helped build the groundwork for some of the major U.S. industries' development of an environmental management system.

The Environmental Protection Agency was involved in the development of ISO 14001 and primarily engineered two of the requirements now in the standards: pollution prevention and compliance management. In its evaluation of any environmental system, the "bottom line" for the EPA includes the following questions:

- Can it be a vehicle for going beyond compliance through pollution prevention?
- Can it assist the organization in improving its compliance?
- Will other stakeholders buy into the environmental management system (e.g., ISO 14001) as an alternative to "command and control"?

TABLE 2.1
U.S. Environmental Protection Legislation

Year	Statute	Purpose
1947	Federal Insecticide, Fungicide, and Rodenticide Act	Screening of the toxic ingredients used in pesticides to ensure they do not present unnecessary hazards to human health or "nontargeted" species
1970	Clean Air Act (amendments)	Requires EPA to set uniform federal ambient air standards through emission controls on new stationary sources, hazardous air pollutants, and new motor vehicles
1972	The Federal Water Pollution Control Act (also known as the "Clean Water Act")	Into the waters of the United States: (a) control industrial discharges; (b) control and prevent spills of oil and hazardous substances; (c) regulate discharges of dredge and fill materials; and (d) provide financial assistance for construction of publicly owned sewage treatment works
1976	The Solid Waste Act (also known as the "Resource Conservation and Recovery Act")	"Cradle to grave" management (including storage, treatment, and disposal) of hazardous waste
1976	Toxic Substance Control Act	Imposes broad regulatory control over all chemicals produced or used in order to eliminate the risk of human or environmental exposure to an untested chemical
1980	The Comprehensive Environmental Response Compensation and Liability Act (also known as "Superfund")	Control inadequate authority and funding in existing environmental legislation for dealing with uncontrolled and abandoned hazardous waste sites
1986	The Emergency Planning and Community Right-to-Know Act	Requires public notification of Extremely Hazardous Substances

The EPA, however, is still not satisfied with the standard in that it is concerned ISO 14001 does not require compliance and has to date been unsuccessful in its efforts to get compliance audit requirements. It is the author's opinion that the EPA has still failed to recognize that the ISO 14001 Environmental Management Standards are voluntary for implementation worldwide and they cannot be as prescriptive from a compliance standpoint. In the United States many industries are fearful of potential compliance auditing requirements because of the legal system in the U.S. (e.g., financial and litigation issues). The result is that many firms will see this as a major obstacle to implementing a continual improvement process or any other management system such as ISO 14001. This issue will be discussed further in Chapter 3.

2.2.3 RESPONSIBLE CARE PROGRAM®

The Responsible Care Program® was established in 1988 by the Chemical Manufacturers Association (CMA) and, although it is a voluntary program, it is a requirement in order to participate in the CMA. Its members are required to:

- improve performance in health, safety, and environmental quality.
- listen and respond to public concerns.
- report their progress to the public.

The Program lists several management practices for chemical companies in the areas of pollution prevention, process safety, emergency response, employee health and safety awareness, product stewardship and general chemical management.

2.2.3.1   Guiding Principles of Responsible Care®

1. To recognize and respond to community concerns about chemicals and our operations;
2. To develop and produce chemicals that can be manufactured, transported, used, and disposed of safely;
3. To make health, safety, and environment considerations a priority in our planning for all existing and new products and processes;
4. To report promptly to officials, employees, customers and the public, information on chemical-related health or environmental hazards and to recommend protective measures;
5. To counsel customers on the safe use, transportation, and disposal of chemical products;
6. To operate our plants and facilities in a manner that protects the environment, and the health and safety of our employees and the public;
7. To extend knowledge by conducting or supporting research on the health, safety and environmental effects of our products, processes and waste chemicals;
8. To work with others to resolve problems created by past handling and disposal of hazardous substances; and
9. To participate with government and others in creating responsible laws, regulations, and standards to safeguard the community, workplace, and environment.

As you become more familiar with ISO 14001, you will notice the compatibility with Responsible Care®. A key difference is that Responsible Care® is a series of very specific management initiatives, while ISO 14001 is a very broad-based environmental management system. The result is participation in Responsible Care® will not automatically meet the requirements of ISO 14001, but does provide an excellent start. Of major concern to many members of the CMA, however, is whether or not ISO 14001 will ultimately even replace Responsible Care®. Specific key differences between Responsible Care® and ISO 14001 are in the areas of identifying environmental aspects, monitoring and measurement as it applies target progress and, thus, continual improvement, auditing, and management review.

2.3   THE EUROPEAN UNION

Various members of the European Union have been primary drivers of the ISO 14001 Environmental Management Standards. For the past two decades, many of the EU

countries have had stringent environmental programs. Germany was a primary mover in the area of recycling when they passed a stringent packaging law in May 1991. The law required manufacturers to assume all responsibility for the recycling and disposal of product packaging. The rest of the European Union, however, caught on quickly. As an example, Sweden, beginning in 1994, now holds companies financially responsible for the manufacture and/or import or sale of packaging and packaged goods for the packaging materials being collected and recycled. Sweden has formed a materials company to manage the program and all companies are required to arrange for package recycling in some manner.

The EU's constantly changing regulations on the environment are continuing to make it harder and harder to conduct business on the European continent. In addition to the 200 plus EC directives, a business must be aware of the individual country's regulations and, most likely, be certified to the ISO 9000 standards. Despite the tremendous efforts to unify the members, an easing of the situation and potential standardization of environmental regulations across the EU is not expected to take place very soon.

2.3.1 ECO-MANAGEMENT AUDIT SCHEME (EMAS)

Passed in 1993 as European Commission Regulation 1836 (e.g., EC 1836/93), the Eco-Management Audit Scheme has the primary objective of promoting continuous improvement of the environmental performance of industrial activities by:

- establishing and implementing environmental policies, programs, and management systems by companies in relation to their sites.
- systematically, objectively, and periodically evaluating the performance of such elements.
- providing information on their environmental performance to the public.

Although voluntary like 14001, it may prove vital for companies to conduct business within the EU, although European companies are unlikely to stipulate 14001 as a trade requirement unless there is a potential market advantage.

This last objective requiring public disclosure of a company's environmental performance has raised major complaints from outside the European Union. The United Kingdom's Environmental Protection Act of 1990 contains some, but less stringent disclosure requirements than EMAS. Additionally, EMAS requires a policy to cover methods for:

- assessing, controlling, and reducing a company's environmental impacts.
- managing energy, raw materials, and waste.
- production process changes.
- product planning (design, packaging, transportation, use, and disposal).
- determining environmental performance and practices of contractors and suppliers.[3]

This last policy requirement is already raising questions from industries in non-European Union countries regarding the potential requirement for a supplier or

contractor to have some certified environmental management system in place before being allowed to conduct business in Europe or with a European-based company with sites in other parts of the world. This situation is already being faced by the automotive industry, and an EMAS-mandated environmental management system will most likely fall next on the power, manufacturing, and waste disposal industries.

The EMAS regulation is being recognized by some non-EU businesses as a very comprehensive specification for an environmental management standard and, thus, are choosing to use it as the reference point for developing their environmental management system instead of ISO 14001. It is expected that ISO 14001 will not affect EMAS, but the difficult choice for many companies will be whether to focus on ISO 14001 or EMAS. Many view ISO 14001 certification as a stepping stone to EMAS. The decision will come from a company's primary goal: *performance* (EMAS) or *conformance* (ISO 14001). Since ISO 14001 is much broader in scope and less prescriptive, it means that businesses already registered to EMAS have the major infrastructure in place for registration to ISO 14001 if they so choose to do so — some most likely will not do so. The German chemical industry, due to its tremendous potential impact on the environment, has been the primary driver of the Eco-Management Audit Scheme (EMAS) and has basically "shunned" ISO 14001 and any of the "bridging" documents developed to link EMAS and ISO 14001.

2.3.2 BRITISH STANDARD 7750

In September 1996, the 15 representatives to the European Union voted to accept ISO 14001 as the sole European standard for environmental management which became known as EN 14001, *Environmental Management Systems — Specification with Guidance for Use*. This decision has and will result in the phase out of all other national environmental management standards throughout Europe, including British Standard 7750. The impact BS 7750 had on the development of ISO 14001 cannot be ignored. Many firms worldwide who have chosen to be certified to BS 7750 as their environmental management system have chosen not to invest further on other standards such as ISO 14001. As a much more rigorous standard, however, registration to ISO 14001 may incur very little extra cost.

British Standard 7750 was issued in 1994 as a United Kingdom environmental management standard and is considered the "father" of ISO 14001. BS 7750 requires a business have the following:

- Policy
- Management reviews
- Management audits
- Management records
- Organization and personnel
- Environmental effects evaluation and register
- Objectives and targets
- Management program
- Management manual and documentation
- Operational control

2.4 NORTH AND SOUTH AMERICA

2.4.1 MEXICO

With the introduction of the North American Free Trade Agreement (NAFTA), a great deal of attention on the environmental problems in Mexico, as well as in Latin America in general, has raised concerns. Many industries in the United States are worried about "pollution export and import" across the southern United States border that will affect U.S. border communities. Thus, there has been pressure on Mexican industries to implement ISO 14001 from firms in the United States who worry that their images may be damaged if they continue to conduct business with "environmentally irresponsible" firms in Mexico, especially those along the border. Mexico, however, has made great strides in the area of environmental protection, and has had an environmental auditing standard which predates ISO 14001 — Mexico's efforts have not necessarily been in response to NAFTA or pressure from United States industries. Although NAFTA does include environmental provisions, Mexico has had strong public commitment and government concern for improving the environment that preceded NAFTA.

Mexico's voluntary environmental auditing program was introduced by the Federal Environmental Attorney General (Procuraduria Federal de Proteccion al Ambiente or PROFEPA) in response to a series of industrial disasters in Mexico which showed there was a serious lack of trained environmental and safety inspectors. The audit is a comprehensive EH&S review and includes worker protection (safety and occupational hygiene) and environmental releases (such as soil and groundwater contamination from prior practices). Additionally, there are verifications of Mexico's environmental, health, and safety regulations and adherence to international EH&S-related standards (i.e., OSHA, EPA, API, etc.).[4] As an example, in order to become and remain competitive in the worldwide market, Mexico's chemical industry adopted the principles of the Responsible Care Program®.

Due to the introduction of TQM in the late 1980s and early 1990s, Mexico's industry has become much more receptive to TQEM-based management approaches. In addition, Mexico's environmental legislation (primarily the 1989 General Law on Ecological Equilibrium) has focused on a prevention-based approach to environmental management. Of major concern, however, are the SMEs (small to medium-sized enterprises) which constitute more than 90% of businesses in Mexico, who are not as familiar with the concept of TQM much less familiar with ISO 14001.

Mexico played a very late role in the development of ISO 14001 and now feels that it has to play catch up. The reason for this is twofold: (1) the lack of support for ISO 14001 early on by Mexico's government and industry has resulted in Mexico being unable to provide proper input into the standards as they relate to potential trade issues; and (2) there has been a general resentment from most of the Latin American and to a minor extent, African nations who feel they were "excluded" from participating in ISO 14001 by the nations who dominated their development — the United States, the European Union, and Canada. Recently, however, the Mexican government and larger businesses have stepped to the forefront as they have begun to see environmental performance as strategic in their efforts to expand markets. In

particular, the electronics industry in Mexico (due to the large export of manufacturing from the U.S. electronics industry) and other industries owned by U.S. firms along the U.S./Mexico border have begun to focus more energy on ISO 14000.

The Mexican government, through a unit of Mexico's environmental secretariat, the National Institute of Ecology (INE), has begun incorporating ISO 14000 into Mexico's environmental laws. Additionally, the Ministry of Environment, Natural Resources, and Fisheries (SEMARNAP) has restructured to incorporate all agencies that are environmentally-related and begun issuing standards for hazardous waste, air emissions, and wastewater discharge. Mexico has begun to position itself as a world-class environment leader.

2.4.2 BRAZIL

Brazil has come under consistent pressure to reduce the destruction of the Amazon rainforests and to implement the concept of sustainable development throughout its industries. Although sustainable development has become a major factor in Brazil, most of the major Brazilian industries are implementing ISO 14001 as a means of avoiding future nontariff barriers and to assist in promoting market share both nationally and internationally.

A third reason for implementation is to comply with Brazil's national environmental laws and regulations that are structured very similarly to those of the environmental regulations in the United States. The enforcement of them has been very relaxed and it is hoped that implementation of an environmental management system like ISO 14001, which requires regulatory compliance evaluations, will help companies to become more regulatory compliant. Of primary difficulty, however, for many Brazilian companies is lack of experience: it has been difficult for small to medium-sized enterprises to get into regulatory compliance much less attempt to implement ISO 14001 because they lack finances and experience and do not have the experience of other companies to draw upon. Much as was done to promote and implement ISO 9000, the Brazilian government will be offering financial support, such as tax incentives.

2.4.3 THE REST OF LATIN AMERICA

The rest of the countries in Latin America have very vague environmental regulations without any specific guidelines. Most of them have rudimentary environmental programs and only began to evaluate ISO 14001 in its later stages. As in Mexico and Brazil, major trade issues and growing public concern over environmental exploitation will continue to drive them towards programs such as ISO 14001 and the development of better defined environmental regulations. Chile and Colombia are two such nations who are now taking a hard look at ISO 14001 as a national standard much as they did with ISO 9000. Industries in Chile and Colombia have begun to draw upon their experiences with ISO 9000 to provide a foundation for potential integration of ISO 14001. Chile, in particular, adopted ISO 9000 as its national standard (NCH-9000) in order to increase and maintain market share. Its mining industry is crucial to that country's economic health and the Chilean government may require registration to ISO 14001. In Colombia, many firms are in the early stages of implementing ISO 14001.

Many are using their ISO 9001 certification procedure as a foundation to work from as they go through the environmental management system process.

Most of the remaining Latin American countries, such as Argentina, do not have a government system that forces a company to implement any kind of environmental program. Additionally, registration to ISO 9000 is almost seen as a last minute implementation in order to meet a customer deadline. However, due to an ever-expanding and increasing role in the global economy, Latin American countries are facing increased pressure to implement not only an environmental management system, but also to catch up with a quality management system (ISO 9000). With the exception of the larger international companies who already have the financial resources to implement ISO 9000 and ISO 14001, failure to do so could create negative financial and economic consequences for a nation.

2.4.4 CANADA

Canada has been one of the drivers of ISO 14001 primarily because of its significant potential impact on sustainable development (Chapter 3). Because of its large forest industry and fisheries, Canada has been at the forefront and a champion of sustainable development industries. Much of its "wealth" is based on its abundant natural resources and, as such, Canada has placed a high priority on the environment on federal, provincial, territorial, and local levels of government. A strong commitment to ecosystem management is now a priority in most corporate Canadian overall business decision-making.

Canada not only hosted the Montreal Protocol (Chapter 3), but is also the home of the International Institute for Sustainable Development (IISD) which plays a key role in monitoring and developing programs and policies that are concerned with integrating trade and the environment.

2.5 ASIAN/PACIFIC RIM

The rapid industrialization of the Asian/Pacific Rim has come at an extraordinary pace and has given Japan, Korea, Singapore, Hong Kong, and Taiwan a very modern and westernized style of living. This rapid growth, however, has not only brought prosperity, but it has also impacted their local environments. All of these nations have land constraints due to their size that in turn has created issues concerning overpopulation, available landfill space, and a depletion of natural resources that are already meager at best. These nations are dealing with air, water, and soil pollution, however, in a manner which is quite different from the United States and Europe — using corporate research and development rather than regulatory pressure. With the electronics industries leading the way, registration to ISO 14001 is growing at a rapid pace in this area.

2.5.1 JAPAN

Much like the rest of the world, the embracing of ISO 14001 has come from major manufacturing and electronic firms. Companies such as Toyota, Matsushita

Electric Industrial, Sony, Honda, and Asahi Chemicals have had strong environmental management programs in place for some time dating back primarily to the early 1970s. Most of the environmental management programs being implemented by these and other Japanese companies do conform to ISO 14001, despite the fact that ISO 14001 did not exist when implementation of environmental management systems began in the early 1980s. Because of the strength of their environmental management programs, several have indicated they will be seeking self-declaration rather than third party certification for ISO 14001.

Because of this, only a handful of large firms are embracing ISO 14001 and general knowledge of ISO 14001 throughout Japanese industry is very limited. In order to increase awareness and implementation of ISO 14001, the Japanese Ministry of International Trade and Industry (MITI) has stepped up a campaign requesting companies to prepare an ISO 14001-based environmental management system. This request is based on a realization that environmental problems extend across borders and can no longer be viewed as just a national concern. MITI is a government department which formulates industrial policy and its standards department promulgates national standards established by the Japanese Industrial Standards (JIS) Committee and disseminates international standards.[5]

This awareness and concern also has led the Japan Federation of Economic Organizations, also known as the Keidanren, to develop its Global Environment Charter (Appendix G). The charter has the basic philosophy that "a company's existence is closely bound up with the global environment as well as with the community it is based in." By using quality control techniques such as root cause analysis and continuous improvement, Japan has placed more emphasis on research and development techniques to deal with its environmental issues rather than placing heavy emphasis on issuing stringent regulations. Ensuring that environmental concerns are part of a product or process design review ensures that product stewardship becomes ingrained in their manufacturing and national philosophy.

2.5.2 AUSTRALIA

Australia became one of the very first countries to adopt ISO 14001 after it was elevated to Draft International Standard. By mid-August 1996, 30 Australian companies had become certified to either ISO 14001 or BS 7750. This same month, however, the Australian government decreed that companies seeking government contracts would no longer need to be certified to ISO 9000. This contradicts the plans of other governments who are stepping up requirements for ISO 9000 certification for the procurement process. This news is naturally expected to be extended to ISO 14001.

The Australian government has indicated that its intent was to give small to medium-sized (SMEs) companies a better chance at being awarded government contracts against the larger companies. As of early 1997, however, very few companies in Australia are implementing ISO 14001. One of the reasons behind this has been Australia's general view of ISO Standards — they are "rules" and not voluntary standards.[6]

2.5.3 HONG KONG

In contrast to Australia, the Hong Kong government has mandated that all consulting firms and contractors who conduct business with the government totaling >$1.25M must have ISO 9001/9002 certification with the expectation of the same requirement for ISO 14001 not far behind.

As in most of the developed areas of the world, Hong Kong's larger firms, based on their experience with ISO 9000, recognize ISO 14001 will be a requirement for conducting international business. Several of these large firms have been sending out questionnaires asking their suppliers for information regarding their environmental management programs, if any. It is expected that this information will be used to give suppliers who have environmental management systems in place preferential treatment for contracts and general business.

2.5.4 TAIWAN

As was discussed at the beginning of this section, Taiwan is faced with an ever-growing dilemma in regards to land restrictions. As the second most densely populated country in the world, Taiwan is constantly challenged with the question as to where to dispose of its waste. Economic prosperity has brought an increase in industrial waste, household waste, and an increase in automobiles and its resultant air pollution.

Taiwan created its own Environmental Protection Agency (EPA) in 1987 to deal with these problems and although enforcement has been strict, compliance from all sectors has been a tough battle. Apart from a few major industries, the incentive to prevent pollution on the island of Taiwan has not taken hold, especially among the general population. Due to the lack of general municipal landfills and incinerators, solid waste continues to pile up on street curbs and trash litters many streets, especially outside Taipei. It has been estimated that >75% of Taiwan's solid waste ends up in landfills — this could be reduced through recycling and management of household waste. But dealing with and managing the problem is a monumental task. The need to build more incinerators has been met with a "Not In My Back Yard" response and educating the general public on the need to sort trash and thus minimize landfill is not being accepted. Although ISO 14001 is being pushed through industry, it will not address the core of Taiwan's problem.

2.6 TOTAL QUALITY ENVIRONMENTAL MANAGEMENT

As was stated earlier in Chapter 1, Total Quality Environmental Management (TQEM) has come about as a result of applying the philosophy of Total Quality Management to Environmental Management. Total Quality Management has helped advance the integration of environmental issues into everyday business thinking and has shown business leadership that environmental management provides an opportunity and not a problem.

TABLE 2.4
TQM and EM Integration

Principle	TQM Focus +	EM Focus =	TQEM Focus
1. Management Responsibility	Sets an "example" and takes the lead	Management responsible by law for impacts	Concerned environmental citizen
2. Training	Skill improvement of worker enhances contribution to the business	Skilled worker has great impact on protecting the environment	Greater impact on business and less impact on environment
3. Process Yields	Waste is a "defect"	Reduce waste to protect the environment	Environmental impacts are "defects"
4. Continuous Improvement	Proactive approach to corrective action	Reactive approach to corrective action	Proactive evaluation of environmental impact
5. Structure and Responsibility	Cross-functionality	Focused responsibility	Cross-functional and wider focus of responsibility
6. Customer Satisfaction	Customer is always "right"	Compliance driven	Protecting community is the "right thing to do"
7. Employee Commitment	All individuals understand the goal	Some understand goal-"forced" commitment	All are committed due to personal concerns
8. Statistical Analysis	Root cause analysis and prioritization	Emissions and discharge monitoring	Analysis used to prioritize and minimize emissions and discharges
9. Customers	*Internal* — Employees *External* — Consumers; Distributors; Stockholders	*External* — Regulatory Agencies; Neighbors and Community	Customer is "everyone" and the surrounding environment

Table 2.4 shows how the principles of Total Quality Management plus Environmental Management equals Total Quality Environmental Management (TQM + EM = TQEM).

2.7 CONCLUSION

In contrast to the quality movement, the environmental movement has been received and embraced much differently. Even within the so-called "developed" countries, the attention given to the environment has been very diverse. From an environmental standpoint, "developed" nations can be separated into three subcategories: a fully *developed* environmental program (with its strict regulatory requirements such as in the United States and the European Union), a *developing* program (such as in Brazil where a regulatory framework is in place, but application and enforcement are

difficult), and an *underdeveloped* program (such as in Taiwan where environmental attention is just now gaining ground).

Understanding your national and local environmental requirements can be quite a challenge for a quality manager and, depending on the management level, the international diversity can be overwhelming. It is hoped that the diversity of international programs will be pared down with the global implementation of the ISO 14000 series of standards. This will allow an international company to consider quality and environmental management systems integration as not just a good idea for an isolated operational unit, but good business sense throughout their organization — locally, nationally, and internationally.