

**ISO 14000 STANDARDS AND CHINA:  
A TRADE AND SUSTAINABLE DEVELOPMENT PERSPECTIVE**

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**and the**

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**Prepared By:**

**Dr. Tom Conway  
Associate  
IISD  
International Institute  
for Sustainable Development**

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## EXECUTIVE SUMMARY

This paper has been prepared for an “International Conference on ISO 14000 and Sustainable Development” being held November 5-7, 1996 in Beijing, China. The objective of this paper is to consider strategic issues posed by the entire family of International Organization for Standardization (ISO) 14000 standards viewed from a trade and sustainable development perspective.

The paper is comprised of five substantive sections that mirror areas where strategic issues for China can arise. Section 2, the first substantive section, provides background and analysis on the family of ISO 14000 standards and the process used to develop these standards. This section should be of interest to readers who have not yet had the opportunity to become informed about the ISO process. Other readers may wish to move to Section 3. The analysis of Section 2 leads to the conclusion that China has an opportunity to actively participate in the ongoing ISO 14000 process since many important issues relevant to Chinese trade interests remain to be resolved. In particular, product oriented standards for environmental labeling, life-cycle assessment, and environmental characteristics of product policies are still being developed.

Section 3 describes the prominent ISO 14001 environmental management system (EMS) standard that is currently attracting the most attention in China. The main conclusion of this section is that ISO 14001 provides an excellent opportunity to improve the environmental performance of companies. There is growing experience internationally that systematic approaches to improve corporate environmental performance (increasing efficiency, reducing resource use and minimizing wastes and polluting emissions) can improve government relations and public image in the market, reduce costs and expand market opportunities. However, because ISO 14001 does not establish performance standards on its own, the amount of environmental performance improvements will depend on the strength of a company’s environmental policy and the domestic environmental policy regime. This section also concludes that China will

need to overcome a cost barrier to the implementation of the standard, particularly in small and medium size enterprises.

Section 4 looks at the relevance of the ISO 14001 EMS standard for China's domestic environmental management regime. The main conclusion of this section is that the ISO 14001 standard can be an important tool in China's environmental management regime. It can help improve compliance with domestic environmental laws and policies and help Chinese export industries deal with environmental challenges in foreign markets. Environmental regimes and economic performance are linked because the environment increasingly influences competitiveness in important export markets.

Section 5, considers the relevance of the ISO 14000 series of standards for international trade. The discussion of this section suggests that the trade implications of ISO 14000 will become more prominent. The reasons for this arise out of: the recognition of ISO standards in World Trade Organization (WTO) trade rules; the role that ISO 14001 certification will play in procurement policies and practices of governments, multinationals and consumers; the impact that the ISO standards will have on the design of other environmental policies that can impact trade, such as eco-labeling programs and initiatives based on life-cycle assessment; and the role that the ISO 14001 EMS standard can play in preparing countries and companies for emerging policies and initiatives directed at sustainable production and consumption that can impact trade.

Section 6 discusses elements of an approach for selecting industry priorities for ISO 14001 certification. The ISO 14001 standard will involve significant costs for industry, and governments assisting industry participation will not be able to move on all fronts at once. Therefore, a major challenge for governments is to choose industry priorities based on calculations about where best to make domestic environmental improvements, protect export markets and pursue new export opportunities. An approach for selecting priorities for ISO 14001 certification would involve: 1) identifying industries with sensitive environmental issues; 2) disaggregating these industries to identify the companies that are most exposed to the environmental issues; and 3) disaggregating the

companies to identify facilities that are the greatest contributors to this exposure keeping in mind that ISO 14001 certification is done at the facility level.

The analysis and conclusions of this paper lead to certain recommendations for China. China has an opportunity to maximize environmental and economic benefits and lesson possible trade barriers of ISO 14000 by:

- adopting the ISO 14001 EMS standard aggressively in priority sectors, including by working with small and medium size companies;
- using the ISO 14001 system to begin preparing companies for the other environmental challenges they will face arising out of current and emerging SP&C policies;
- working with companies to improve their environmental policies so as to improve the environmental performance of the country;
- ensuring that the domestic environmental regime works with ISO 14001 to promote actual environmental performance improvements; and
- actively participating in the ongoing ISO process that is still producing product oriented standards, (e.g. environmental labeling and life-cycle assessment standards), that will be important to trade and environment issues in the coming years.

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## **1.0 Introduction**

This paper has been prepared for an “International Conference on ISO 14000 and Sustainable Development” being held November 5-7, 1996 in Beijing, China. The objective of this paper is to consider strategic issues posed by the entire family of ISO 14000 standards viewed from a trade and sustainable development perspective. Other contributions to the conference will be looking at the more technical issues associated with implementing within organizations the ISO 14001 Environmental Management System (EMS) standard.

The paper is comprised of five substantive sections that mirror areas where strategic issues arise. Section 2 provides background and analysis on the family of ISO 14000 standards and the process used to develop these standards. Section 3 describes the prominent ISO 14001 environmental management system standard that is attracting the most attention in China. Section 4 looks at the relevance of the ISO 14001 EMS standard for China’s domestic environmental management regime. Section 5, considers the relevance of the ISO 14000 series of standards for international trade. Section 6 discusses elements of an approach for selecting industry priorities for ISO 14001 certification.

## **2.0 The ISO 14000 Series**

This section of the paper provides a description and analysis of the ISO’s work on the 14000 series of environmental standards. The analysis of this section leads to the conclusion that China has an opportunity to actively participate in the ongoing ISO 14000 process since many important issues relevant to Chinese trade interests remain to be resolved. In particular, the product oriented standards for environmental labeling, life-cycle assessment, and environmental characteristics of product policies are still

being developed. To this point, the process has been dominated by industry from OECD countries.<sup>1</sup>

## **2.1. Origins of the ISO's Work**

The ISO is a federation of non-governmental organizations established in 1947 to develop international standards, improve international communication and collaboration, and facilitate the exchange of goods and services. The federation is currently comprised of close to 100 national standards bodies (member bodies) from countries representing approximately 95 percent of the world's industrial production. The headquarters of the ISO secretariat is in Geneva, Switzerland.<sup>2</sup>

The ISO's involvement in establishing environmental standards began in 1991 after organizers for the UN Conference on Environment and Development (held in Rio de Janeiro in 1992) asked whether or not ISO would be attending the conference and whether it was involved in any environmental activities. As a result, the ISO established a Strategic Advisory Group on the Environment (SAGE) in 1991 to assess the need for international environmental management standards.<sup>3</sup>

SAGE recommended that ISO proceed with an environmental standard by 1992 and that a technical committee be established to carry it through. On June 1, 1993, ISO's Technical Committee 207 (TC 207) held its first plenary meeting. TC 207 was directed to establish environmental standards in five areas of environmental management: environmental management systems; environmental auditing and related environmental investigation; environmental labeling; environmental performance

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<sup>1</sup> For discussions of the domination of ISO 14000 development by industry, see Nash and Ehrenfeld (1996), International Environmental Systems Update (1995), and the European Environmental Bureau (1995).

<sup>2</sup> Detailed descriptions of ISO are found in Knight (1994), Nash and Ehrenfeld (1996) and the European Environmental Bureau (1995).

<sup>3</sup> Nash and Ehrenfeld (1996) describe the formation of SAGE in this way although other authors have various explanations. Cascio (1994) attributes the formation of SAGE to the growing number of environmental standards worldwide and the overwhelming adoption and acceptance of ISO 9000, which moved ISO to command SAGE with investigating the need for an international environmental management standard and making recommendations on how to approach the development of such a standard.



evaluation; and life-cycle assessment. Consequently, TC 207 was divided into five subcommittees (SCs) for each category of standard and one SC to cover the terms and definitions of the standards. In addition, a working group, which reports directly to TC 207, was formed to deal with the environmental aspects in product standards. The five SCs have two or more working groups (WGs) that report to them (unlike the WG on product standards previously mentioned which reports directly to TC 207).<sup>4</sup>

The key factor that has propelled the ISO 14000 series of standards forward throughout the early 1990s is the increase in national environmental standards. Examples of these standards include some two dozen eco-labeling schemes worldwide (see Annex 1), the British Standards Institute's BS 7750 (Specification for Environmental Management Systems), the Canadian Standards Association's Z750 (A Guide for a Voluntary Environmental Management System), and the EU EMAS (Eco-Management and Audit Scheme). Other similar environmental management standards have been developed by the French Standards Association, the South African Bureau of Standards and the Spanish Standards Association.

With the proliferation of environmental standards, concerns have been expressed that these standards would fragment international markets and unduly favor the companies of the countries or of the regions where these standards were developed, unless they were developed by authoritative and broadly based international bodies. The ISO was to serve this role.

## **2.2 Membership Rules<sup>5</sup>**

The membership of the ISO is divided into categories. A "full member" is a national standards body which is "the most representative of standardization in its country". "Correspondent members" are organizations from countries that do not have a national

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<sup>4</sup> See Wood (1994), Knight (1994), and Rhodes (1995) for descriptions of the formation and subdivision of TC 207.

<sup>5</sup> Details regarding membership rules of ISO are delineated in European Environmental Bureau (1995), Knight (1994), Nash and Ehrenfeld (1996), and Bell and Connaughton (1993).

standard setting body (usually a developing country). A “subscriber country” is a “country with a small economy”. “Liaison members” are generally international organizations with a stake or experience in the area, such as UNEP and the World Wildlife Fund.

ISO member countries (or “bodies”) are given the choice to participate in any of the ISO TCs. After choosing to participate in a TC, member countries will generally select the SCs and WGs they will participate in. Some countries will participate in all SCs and WGs, while others are more selective either because of their interests or the costs of participating in all SC meetings held at different times and locations.

Countries are also given the choice to be either voting members (participating or “P” members) or non-voting members (observing or “O” members), but can change their status at any time. If a country chooses to be a “P” member it must agree to support financially the work of the TC or SC that it is participating in, primarily through agreeing to send a country delegation to meetings and supporting certain other activities or hosting events. “L” members can participate but do not have the option to vote.

Approximately 50 member countries and 15 liaison organizations participate as “P”, “O” or “L” members in the work of TC 207. Depending on their level of interest, some member countries have taken leadership roles in TC 207 SCs typically through becoming the secretariat for an SC. For example, the United Kingdom holds the secretariat for SC1 developing the environmental management systems (EMS) standard. All member countries are also responsible for creating national committees which will support their work within ISO.

### **2.3 Standards Development Procedures**

Standard setting under the ISO is a lengthy process. The ISO’s work results in international agreements that are published as international standards. Any group of five member countries can begin this process by suggesting the need for a standard to

the ISO secretariat in Geneva. The secretariat will review the proposal and the opinions of member countries to determine if support exists for work to begin on the proposed standard. If the decision is to proceed, the secretariat will attempt to assign the issue to an existing TC, but may need to establish a new TC. If an existing TC accepts work on the proposed new standard, it can decide to establish a separate TC reporting to it or simply create a new SC to complete the work.

Draft standards generally move through three stages including, an initial document stage, a draft international standard (DIS) stage, and a final draft international standard (FDIS) stage. Ballots of “P” members are taken at each of these stages. The SC votes on the initial document, the TC votes on the DIS, and ISO member countries vote on the FDIS. Decision making in the ISO is taken by consensus votes. If any “P” member opposes a standard it cannot move forward, although a country can decide to abstain.

## **2.4 Brief Descriptions of the Standards**

The environmental management system and auditing standards will be the first ones officially released by the ISO. However, these system standards are only the first wave in the ISO 14000 series.<sup>6</sup> Standards that are more product oriented are also expected. The more product-oriented standards are life-cycle assessment, environmental labeling, and a proposed environmental product standard to guide organizations that write product standard provisions. Below we provide brief descriptions of the various standards.<sup>7</sup>

### **2.4.1 Environmental Management Systems (ISO 14001)**

The EMS standard being developed by SC1 is the only specification or registration standard in the ISO 14000 series. The others standards are guideline standards. As

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<sup>6</sup> Begley (1996) states that ISO 14001 and ISO 14010/11/12 are expected to be published by October 1996 with ISO 14024 next (perhaps by the end of 1996) and 14031 and 14040 to follow in 1997 or 1998.

<sup>7</sup> For more detailed descriptions of each ISO 14000 document see Tibor and Feldman (1996) or McCreary (1996).

noted in section 3, the EMS standard describes a business management system with specified elements. This standard is set for official release by the ISO around October, 1996. A meeting of TC207 was held from June 18-23 in Rio, Brazil where a ballot of "P" members was taken on the FDIS of ISO 14001. The standard passed the balloting without difficulty.

#### **2.4.2 Environmental Auditing (ISO 14010, 14011, 14012)**

The auditing standards being developed by SC2 cover general principles of auditing, procedures for auditing an EMS, and qualification criteria for auditors. They focus on verifying that the EMS incorporates the specifications laid out in ISO 14001. These standards are also expected to be officially released around October, 1996.

#### **2.4.3 Environmental Labeling (ISO 14024)**

The environmental labeling standards being developed by SC3 outline rules and procedures for developing three kinds of labels: a general label for products that meet specified requirements (Type I), one for specific claims such as energy efficiency or recycled content (Type II), and one that summarizes a life cycle inventory so consumers can compare products on the basis of environmental impacts in manufacturing and use (Type III). The release of these standards should begin by the end of 1996.

#### **2.4.4 Environmental Performance Evaluation (ISO 14031)**

The environmental performance evaluation standard being developed by SC4 is to provide guidelines for measuring, analyzing, and assessing a company's environmental performance relative to established objectives and targets. This standard will support the specification in the ISO 14001 standard that organizations seek continuous improvement. It is likely that this standard will not be ready until 1998.

#### **2.4.5 Life-Cycle Assessment (ISO 14040).**

SC 5 is developing various standards to provide guidelines for the use of life-cycle assessment in decision making. Life-cycle assessment looks at the environmental impacts of products, processes and services from raw material acquisition to final disposition, or from “cradle to grave”. At the last SC 5 meeting in March, 1996, held in Rio, Brazil, ISO 14040, the first standard to be produced by SC 5, was approved to the level of a DIS standard.

#### **2.4.6 Environmental Product Standards and Definitions**

Working Group 1 on environmental aspects of product standards is at a very early stage. SC 6 on terms and definitions will not produce documents since its role is to review documents from the other SCs to make sure definitions are consistent throughout all ISO 14000 documents.

### ***2.5 Participation in the Standards Development Process***

With few exceptions, country delegations to TC 207 meetings have been dominated by industry from OECD countries, include some government officials, and only rarely involve public interest groups. Consensus decision making has encouraged the ISO to avoid controversy and has tended to reinforce the relative homogeneity of participating groups. However, growing public recognition of the importance of ISO 14000 is contributing to pressure to diversify participation at the ISO. Countries and groups that have previously played a low key role or not participated at the ISO, are increasing their awareness and involvement.<sup>8</sup>

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<sup>8</sup> Knight and Wolfe (1995) state that more than 21 developing countries were represented at the TC 207 third annual plenary meeting, a marked increase from 1994; however, the European Environmental Bureau claims that it is those members of ISO that consistently attend meetings and do most of the drafting of the standards that make the decisions. Furthermore, most developing countries do not have a “participatory” membership (i.e. a right to vote), since they cannot afford the financial commitment involved in being a “participating” member of an ISO committee.

The SCs and WGs of TC 207 are typically chaired by executives of large firms and transnational corporations headquartered in developed countries, such as KPMG Environmental Consulting, Merck and Company, Bayer, Du Pont and Scott Paper.<sup>9</sup> Representatives from developing countries generally participate far less because they often lack the resources to devote to ISO activities or are not entirely aware of the relevance of ISO's work. China, for its part, appears to have become aware of the significance of the ISO's work only recently and is moving to increase its role in the international process and in domestic adoption of the standards.

Public interest groups have been invited to meetings under TC207, but they typically lack the resources to attend meetings and follow proceedings consistently. As a result, large industry from developed countries has generally dominated much of the ISO TC207 process.<sup>10</sup> For example, approximately 400 representatives of industry from the United States alone have actively participated in the development of ISO 14000 standards whereas only 20 government and public interest groups have participated.<sup>11</sup> The US delegation to the TC 207 meetings held in Oslo, Norway June 26 to July 1, 1995 involved approximately 120 people. It is fair to say that the Chinese delegation has taken a much lower profile at TC 207 meetings. Similar participation patterns were witnessed at the TC 207 meeting held in Rio in June, 1996, although China had a more active delegation at those meetings.

Generally, the chemical, electronics, pulp and paper, and non woven fabrics industries have followed the development of ISO 14000 standards closely.<sup>12</sup> The pulp and paper industry and non woven fabrics industry have shown particular interest in the work of

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<sup>9</sup> See annex 2 of the European Environmental Bureau (1995) for a listing of large firms and transnational corporations holding leadership positions within TC 207 and a listing of countries whose TC 207 members are industry organizations.

<sup>10</sup> International Systems Update (1995) and European Environmental Bureau (1995).

<sup>11</sup> Nash and Ehrenfeld (1996)

<sup>12</sup> In annex 2 of the European Environmental Bureau (1995) the list of large firms and transnational corporations involved in decision making in TC 207 includes Merck and Company (chemical), Bayer (chemical/pharmaceutical), Rhone-Poulenc (chemical), Du Pont (chemical), and Scott Paper Company. Furthermore, the companies listed as ISO 14001-registered under the Japanese Accreditation Bureau (see appendix ? of this paper) include several electrical companies and chemical companies. Many of the papers referred to in the bibliography of this paper are from pulp and paper, chemical, electrical and non wovens journals.

SC-5 (the life-cycle assessment subcommittee).<sup>13</sup> Other industry groups which have served as representatives on subcommittees include the chemical, electronics, petroleum and consulting industries.<sup>14</sup>

These patterns of participation indicate the areas where ISO 14000 standards are expected to have their greatest benefits and potential impacts for businesses that compete in international markets. This is probably the best test of what sectors in China will benefit most from watching closely and participating in ISO 14000. Other criteria to make this assessment are indicated in Section 5.4.

While the ISO 14001 EMS standard has largely been set, ISO discussions are ongoing regarding the more product oriented standards on life-cycle assessment, environmental labeling, and environmental aspects of product standards. As a result, China has an excellent opportunity to be actively involved. We revisit this point in section 5.2 below from the point of view of the trade significance of some of these other standards.

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<sup>13</sup> Rhodes (1995)

<sup>14</sup> Nash and Ehrenfeld (1996)

### **3.0 The ISO 14001 EMS Standard**

This section of the paper describes the specifications of the ISO 14001 EMS standard and some of the outstanding issues related to its implementation. The main conclusion of this section is that ISO 14001 provides an excellent opportunity to improve the environmental performance of companies. There is growing experience internationally that systematic approaches to improve corporate environmental performance (increasing efficiency, reducing resource use and minimizing wastes and polluting emissions) can improve government relations and public image in the market, reduce costs and expand market opportunities. However, because ISO 14001 does not establish performance standards on its own, the amount of environmental performance improvements will depend on the strength of a company's environmental policy and the domestic environmental policy regime. This section also concludes that China will need to overcome a cost barrier to the implementation of the standard, particularly in small and medium size enterprises.

#### **3.1 Specifications of the Standard**

The EMS standard is intended to help an organization to (See section A.4.0 in the draft standard):

- a) establish an environmental policy appropriate to itself;
- b) identify the environmental aspects arising from the organizations past, existing or planned activities, products or services, to determine the environmental impacts of significance;
- c) identify the relevant legislative and regulatory requirements;
- d) identify priorities and set appropriate environmental objectives and targets;
- e) establish a structure and programme(s) to implement the policy and achieve objectives and targets;
- f) facilitate planning, control, monitoring, corrective action, auditing and review activities to ensure both that the policy is complied with and that the environmental management system remains appropriate;



- g) be capable of adapting to changing circumstances

ISO 14001 assigns great importance to senior management to provide leadership in defining the organization's environmental policy. An environmental policy is essential for an EMS because the ISO 14001 standard does not establish environmental performance objectives and targets for the organization (i.e. does not require that the organization comply with a specified level of environmental performance that is not its own). Rather, the requirements of ISO 14001 are quite flexible requiring that an organization:

- “consider” environmental impact when setting objectives and targets;
- commit to “continuous improvement” of environmental performance and pollution prevention (however defined); and
- comply with applicable legislative and regulatory requirements in the jurisdiction where the facility is located (if such requirements exist).

This flexibility is a necessary feature of ISO 14001 because of the wide range of companies that will want to participate in ISO 14001 who have different environmental and economic conditions. It also allows organizations and countries to set environmental performance objectives and targets suitable to their needs. Finally, it avoids the trade implications of dictating specific environmental performance requirements across national boundaries in an extraterritorial fashion.

However, the flexibility of ISO 14001 means that environmental performance objectives and targets may not receive attention unless they are:

- “imported” into the EMS through the organization's environmental policy; and/or
- supported by the existence of a domestic environmental policy and regulatory regime that establishes relevant environmental performance requirements and sets benchmarks for continuous improvement.

For this reason, ISO 14001 itself does not ensure environmental protection and sustainable patterns of development. However, in those instance where organizations

are starting with negligible environmental awareness and no systems for addressing environmental issues, instituting an ISO 14001 program is bound to be a significant step towards improving environmental performance. This is true even though a lot of work may need to be done to improve the environmental policies of organizations and the domestic environmental policy and regulatory regime.

Employee education and training is another key element of an EMS under ISO 14001. Organizations are required to ensure that "all personnel whose work may create a significant impact upon the environment" are properly informed about the environmental significance of their work. Personnel must also be made aware of the importance of compliance with policies, procedures, and requirements of the EMS, their responsibilities under the EMS, and the potential impacts of their actions. ISO 14000 does not specify any requirements for rewards or penalties for worker performance, but simply states that employees will be made aware of "the potential consequence of departures from specified operating procedures".

All organizations must perform self-auditing periodically in order to determine whether the environmental management system conforms to the ISO 14001 standard and to determine whether it is being properly implemented and maintained. Organizations registered to ISO 14001 must have their compliance with the standard verified by a third party which is registered with an accrediting agency.

Organizations can either be "registered" under ISO 14001 or "self-declare" their participation. Registered organizations will have third party verification that they have developed, documented, and are following an EMS according to the ISO 14001 standard. It is likely that companies will seek to become registered to ISO 14000 by application to a "registrar." Once an application is filed, the registrar will perform a conformity assessment evaluating an applicant's EMS system against the ISO 14001 criteria. It is expected that registration can take from six months to a year, and once granted, will last for three years.<sup>15</sup>

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<sup>15</sup> McCreary (1996)

Each country adopting ISO 14000 will be allowed to develop its own scheme for accreditation of registrars, certifiers and approval of training programs offered to auditors seeking certification.<sup>16</sup> The accrediting body can be a governmental or non-governmental organization. This approach has eliminated a potential trade irritant that can arise from schemes that do not provide for domestic verification procedures or imply foreign verification of compliance with a voluntary standard, an issue that has garnered considerable attention in debates about eco-labeling schemes.

### **3.2 International Implementation Trends**

Many countries world-wide are working quickly to develop ISO 14000 accreditation and certification systems. Some countries moved quickly to meet demand for certification against the FDIS standard.<sup>17</sup> European countries, in particular, are active because they have more experience with EMS standards developed by the British Standards Institute (BS7750) and the EU's EMAS. Many European businesses are registering their facilities under EMAS or BS 7750.<sup>18</sup> Although similar to ISO 14001, both EMAS and BS 7750 are more stringent than ISO 14001. EMAS, in particular, is more prescriptive with a stronger emphasis on public reporting of environmental performance data as noted in Table 1.<sup>19</sup>

The differences between ISO 14001 and EMAS requirements will likely become blurred over time. There are three reasons for this. First, governments and corporations purchasing products and services from overseas suppliers will increasingly require that

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<sup>16</sup> A *Registrar* is the organization with which companies seeking to demonstrate conformity with ISO 14000 register. A *Certifier* is an auditor who performs a third-party EMS audit for ISO 14000 verification. *Training Programs* are offered to auditors seeking certification.

<sup>17</sup> Donaldson (1996) writes that SGS-Thompson Microelectronics claimed the first facility certification to the draft international standard in the U.S. See Donaldson (1996), Hotter (1996), Sissell (1996), Tilton (1996) and Sissell and Mullin (1995) for examples of companies already preparing for accreditation and certification.

<sup>18</sup> See Roberts (1996) for an example.

suppliers report on environmental performance because they need to respond to public pressures to show how they are minimizing life-cycle environmental impacts downstream and up-stream of their facilities. Second, research conducted in OECD countries indicates that voluntary approaches are far more likely to be successful at achieving environmental performance objectives if they have clear environmental policy objectives and benchmarks, and public reporting requirements. Most OECD governments will undoubtedly be attempting to move voluntary approaches in this direction over time. Third, companies themselves will begin competing for the environmentally sensitive consumer through increasingly lofty reporting efforts that show how they are “greener” than the competitor.

In time, therefore, public reporting on environmental performance may become a de facto requirement in important global export markets. China will need to monitor these pressures for stricter standards in the event that they begin to take hold in important export markets and reveal potential to undermine the expected trade benefits of participating in the ISO 14001 standard.

**Table 1: Comparison of EMAS and ISO 14001**

Characteristic	EMAS	ISO 14001
environmental management system	yes	yes
preparatory environmental review	yes	yes
environmental policy	yes	yes
environmental effects evaluation (establish procedure for identifying environmental aspects of activities)	yes	yes
commitment to continuous improvement of environmental performance	yes	yes

<sup>19</sup> No attempt is made in this paper to discuss the negotiating history of ISO 14001. It is true, however, that EU countries pushed for stronger environmental performance reporting requirements while US representatives resisted for various reasons including the legal implications of reporting in the US system.

objectives and targets	yes	yes
environmental management programmes	yes	yes
employee education, training, and competence	yes	yes
documentation	yes	yes
operational controls (identify and control operations associated with significant environmental aspects)	yes	yes
monitoring and measurement systems	yes	yes
records	yes	yes
self-audits/internal or external management system audits	yes	yes
third party verification	yes	yes
public environmental statement	yes	no
seeks to reduce international trade barriers	no	yes
requires summary of environmental performance data such as pollutant emissions	yes	no
goal of audit is to determine compliance with EMS as well as efficacy of EMS in bringing about environmental progress at the site	yes	no purpose of audit is simply to confirm compliance with EMS

Notable recent initiatives in North and South America and Asia to prepare for ISO 14001 include:

- Two organizations in the US, the Registrar Accreditation Board (RAB) and the American National Standards Institute (ANSI), are preparing to share ISO accreditation responsibilities.
- In November 1995, the Standards Council of Canada (SCC) began an accreditation program. Also, the SCC is establishing accreditation for certification of EMS auditors and for organizations that will provide training courses.
- Mexico's participation in TC 207 is coordinated by the Mexican Institute of Standardization and Certification (IMNC). IMNC intends to establish a national certification system for ISO 14001. It is expected that Mexico will follow the route it took for ISO 9000 certification, which would mean that IMNC would develop and publish environmental management-related Mexican standards that would closely resemble the ISO 14000 standards.
- Brazil has started to develop its national system for accreditation. The National Commission on Metrology and technical advisory groups have established a working group which is defining criteria for certification and accreditation.
- Venezuela has not yet decided how to handle accreditation and certification, however, the National Standards Institute (COVENIN) has established a subcommittee which, in a scheme very similar to ISO 14000, is developing environmental standards for EMS, auditing, labeling, and life-cycle assessment.
- The Japan Audit and Certification Organization is certified as a BS 7750 verifier and will also grant ISO 14000 certification once the standards are final and the Japanese Industrial Standards for environmental management are ready.
- In November 1995, Hong Kong began a 14 month pilot EMS/ISO 14000 program for companies interested in developing environmental management systems. In addition, the British Standards Institute along with Inchcape Testing Services has created BSI Pacific, which provides training and certification services for ISO 14000. BSI Pacific has offices in Hong Kong and Taipei and is focusing its initial efforts on China, Taiwan, and Hong Kong.
- In Taiwan, the Bureau of Commodity Inspection and Quarantine (BCIQ) is interested in managing ISO 14000 accreditation and certification. This coming July

a Body of Accreditation and Certification will be established. Its responsibilities will include ISO 14000 registration, ISO 9000 registration, auditor training courses and the registration of auditors.

- A pilot program for companies interested in becoming certified with conformity to AS/NZS ISO 14001, began in January of 1996 by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ), will be completed by June 30. This pilot program will confirm the suitability of JAS-ANZ's draft accreditation criteria and JAS-ANZ's accreditation process.<sup>20</sup>

China's work on ISO 14000 is also proceeding in anticipation of the official release of ISO 14001. Recently, an ISO 14000 auditing centre was established under the National Environmental Protection Agency. The centre plans to organize ISO 14000 training programs nationwide, and will probably serve as the certification agency for ISO 14000. Work has also been undertaken in Xiaman in the Fujian Province on the implementation of ISO 14000, according to a report on an ISO 14000 seminar held in Xiamen. About 20 environmental auditors from Tianjin have recently been trained in the EU-Singapore Regional Institute of Environmental Science and Technology, and will form the main force for ISO 14000 auditing.

### **3.3 Problems with Implementation Costs**

There are unresolved questions about how viable it will be for developing countries and small and medium size companies to participate in ISO 14001. Registration fees for ISO 9000, a similar management system standard targeted at quality assurance, range between \$25,000 and \$100,000 for companies with between 50 and 1,500 employees, plus consultants' fees from \$5,000 to \$25,000 and the cost of staff time. Similar costs are likely to be incurred for ISO 14001.<sup>21</sup> Substantial maintenance costs can also be expected given that facility registration to ISO 14001 must be renewed every 3 years.

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<sup>20</sup> Business and the Environment, 1996. *ISO 14000 Update*.

<sup>21</sup> Kurylłowicz (1996)

ISO 14001 costs will often decrease on a per employee basis for large companies indicating that they will have a cost advantage over small and medium size companies. However, the number of employees is not the only indicator of costs. It is also likely that costs will be higher for companies that generally have more environmental issues to address, such as chemical plants, and companies that do not have experience with environmental or quality assurance management systems. For example, companies that have ISO 9000 registration could enjoy significant cost advantages.<sup>22</sup>

Some concerns have been expressed that many small and medium size companies will find it difficult to assume the costs of ISO 14001.<sup>23</sup> This is especially the case for those companies with large numbers of environmental issues to address and limited experience with rigorous management systems. Small and medium size firms in developing countries, in particular, fall into this category in disproportionate numbers and are the companies that often have the greatest impacts on human health and the environment within or close to communities.

If small and medium size companies are not able, or decide not to participate in ISO 14001 there will be a significant lost opportunity to improve their environmental performance and the performance of the economy as a whole. ISO 14001 would act to move these companies from a very low level of environmental awareness and management. In short, the incremental environmental performance improvements from ISO 14001 will likely be much higher for small and medium size companies than for large companies that already manage environmental issues and have management systems in place.

Another option that these companies might take is to lower their costs by "self-declaring" participation in ISO 14001 rather than becoming ISO 14001 "registered". This option may have negative consequences for market access if ISO 14001 becomes an

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<sup>22</sup> Mullin and Sissell (1995), Shah (June 1996) and (March 1996), and Tilton (1996) discuss costs in their articles.

<sup>23</sup> Silverstein (1996)



important requirement for access to their markets or any future markets in the case of emerging sectors.

China will need to acknowledge that many of its most severe environmental problems occur in small and medium size companies. Actions will need to be devised to bring these smaller companies along.

## **4.0 Implications for the Domestic Environmental Regime**

This section explores the relevance of ISO 14001 for China's domestic environmental regime. No attempt is made to be comprehensive, but rather the section identifies key issues. The main conclusion of this section is that the ISO 14001 standard can be an important tool in China's environmental management regime. It can improve compliance with domestic environmental laws and policies and help Chinese export industries deal with environmental challenges in foreign markets. Environmental regimes and economic performance are linked because the environment increasingly influences competitiveness in important export markets.

### **4.1 China's Environmental Regime**

Asian economies have experienced rapid economic growth in recent years. For example, between 1980 and 1992, annual growth in gross domestic product averaged more than 8% in China, South Korea, and Thailand, while the economies of Hong Kong, Indonesia, Malaysia, and Singapore grew 5.5 to 8% per year. However, significant environmental degradation has accompanied this economic growth.<sup>24</sup> Environmental degradation will be an increasing problem for Asian countries and developing countries in other parts of the world.

In recent years, China has attached increasing importance to the development and implementation of environmental legislation to address environmental problems. China's laws are relatively comprehensive ranging from the basic environmental protection law to laws and regulations covering various aspects of the environment, including: the marine environment, water, air, solid wastes, land, forests, grasslands, water, mineral resources, fisheries, and wildlife.

China's domestic regime is comprised of the so-called "eight systems" consisting of the "three old systems" (environmental impact assessment, pollutant discharge fees, and

the three synchronizations), and the “five new systems” (a discharge permit system, the environmental responsibility system, an annual assessment of environmental quality in cities, limited time treatment, and centralized pollution control). The eight systems are implemented in conjunction with environmental quality and emission standards. The implementation systems and environmental standards rely heavily on direct government regulation often making them prohibitive to actually enforce. Negotiation and dispute settlement processes figure far more prominently than the courts in resolving regulatory disputes.

Only recently has China attached importance to environmental management at the micro or organization level. For instance, in March, 1993, as one of the World Bank’s technical aid projects, China began pollution discharge auditing for clean production (clean production auditing) on an experimental basis in selected enterprises and cities. Clean production auditing aims at defining the conditions and causes of the discharge of pollutants at various stages of the production process, and instituting plans for the prevention and control of pollutants.

#### **4.2 Potential Impacts on the Domestic Regime**

Many developing countries lack environmental laws, have poorly crafted laws, and lack institutional capacity to enforce the laws. In countries where the domestic environmental protection regime is not developed, ISO 14001 appears, albeit incorrectly, to provide a complete solution on its own.<sup>25</sup> First, the EMS standard holds out the promise that companies will come up with their own methods for protecting the environment. Second, the standard seems to suggest that over-committed government officials need not be directly involved since independent auditors will do most of the monitoring. However, as noted above, ISO 14001 itself does not stipulate environmental performance requirements. Rather, ISO 14001 must be linked with performance requirements in the form of an organization environmental policy and/or domestic government laws and policies.

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<sup>24</sup> Tremblay (1996)

Many observers have only recently begun to consider the significance of international standards for domestic environmental law and policy. Implications for China's domestic environmental law and policy arising from the ISO 14001 standard mainly stem from the fact that the standard requires that companies comply with current environmental policies and regulations that apply to their industry. Countries are looking for ways to move away from traditional forms of environmental regulation that can be inflexible and costly towards voluntary frameworks with supportive regulation that reward innovation and foster continuous improvement. Much of this movement reflects new thinking about how to enhance environmental performance, but also accommodates industry's concerns about competitiveness in a global economy.<sup>26</sup>

ISO 14000 might affect Chinese domestic environmental law and policy in a number of ways. The legal authority for the development of ISO 14000 comes from the International Standards Organization. As such, it will not necessarily be a formal part of Chinese law. However, regulators throughout the world can be expected to encourage ISO 14000 registration both for trade considerations and because of evidence that the adoption of environmental management systems can improve environmental performance, decrease the probability of an environmental incident, and improve a company's ability to respond to an accident.

It is also conceivable that ISO 14001 could have a more direct legal impact. It might be possible, for example, for the Chinese government to develop regulations that incorporate ISO 14001 standards by reference. Even if they do not directly refer to ISO 14001, it is also possible that Chinese authorities will develop regulations in some areas which are heavily influenced by the ISO emphasis on management systems and reporting, rather than by developing more traditional command and control style regulations. There are a number of examples of this type of regulation in developed

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<sup>25</sup> Tremblay (1996)

<sup>26</sup> For a description of the movement in the U.S. away from traditional forms of environmental regulation and towards voluntary frameworks and the incorporation of ISO 14001 into government regulations, see Begley (1996) and [www.pader.gov/dep/seif/isosenat.htm](http://www.pader.gov/dep/seif/isosenat.htm) on the internet. As well, Silverstein (1996)

countries. For example, the Ontario Government's (a provincial government in Canada) Waste Minimization Regulation compels all large firms in specified industries to audit their wastes, establish waste reduction targets, develop plans for reaching those targets, monitor their progress, and post progress reports for their employees to review. The Ontario government plays no role in establishing the objectives or in monitoring progress. Yet this regulation has had a substantial impact upon responsible companies with adequate resources.

If registration becomes widespread, it is also foreseeable that the Chinese government could rely on ISO 14001 to interpret both statutory and non statutory duties of environmental care. Over time, for example, the implementation of an ISO 14001 style EMS may emerge as a widely accepted standard of practice in some sectors. In this case, it is likely that negotiation, dispute settlement or the courts could refer to such a standard of practice when reviewing an alleged offense and when determining what the appropriate response should be in terms of a penalty and/or corrective action. Use of ISO 14001 in this manner would complement, not compete with other mechanisms used by environmental regulators.

The Chinese government may also be able to use ISO registration as a penalty which will minimize the opportunity of repeat offenses. In this regard, it is instructive to note that a Canadian court recently required ISO registration as part of the penalty imposed on a repeat offender (in the unreported February, 1996 decision of the Alberta Court in *Re Prospec Chemicals*). By ordering the offending company to comply with ISO 14001, the court effectively ordered the company to implement its environmental management systems to a degree of thoroughness and sophistication that the court would not have been able to specify on its own.

For similar reasons, Chinese government officials may decide to rely on ISO 14001 registration as a guide when establishing enforcement priorities by paying more attention to non registered companies than to registered companies. Even before the

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discusses the world-wide move towards a new "post regulatory era" and mentions governmental acceptance of ISO 14000 in Japan.

development of the ISO standard, some developed countries have relied on the presence of environmental management systems to help establish enforcement priorities. A 1989 Dutch guidance document states, for example, that "companies which do not have an efficiently operating environmental management system at their disposal will in the Government's view be sooner considered for intensified enforcement activities by competent enforcement authorities relative to companies which are trusted to have an efficiently operating environmental management system."<sup>27</sup> A recent study of the possible impact of ISO 14001 on Canadian enforcement policy similarly concluded:

For regulators, acceptance of ISO 14000 as a benchmark . . . would allow them to focus their enforcement resources on the ill intentioned and the incompetent. Fewer routine inspections are necessary for firms which are already paying highly qualified independent auditors to inspect and evaluate their operations. Fewer resources are necessary to assess the due diligence of such businesses, once there is a detailed external benchmark, particularly since ISO compliant firms must methodically document their environmental performance<sup>28</sup>

Finally, Chinese authorities could also use ISO 14001 as an alternative to regulations. In some sectors, the Chinese authorities may decide that they will be more effective in promoting environmental performance if they encourage or require ISO registration instead of establishing and enforcing standards. It is conceivable, for example, that in some export intensive sectors market pressures to implement ISO 14001 will stimulate collective pressure for continuously improved performance.

In this regard, the increased use of ISO 14001 may stimulate Chinese authorities to focus their attention in some cases on enhancing the reporting requirements under the ISO standard, or on increasing the oversight power of third parties. If a significant portion of a sector becomes or is likely to become ISO 14001 certified, it is possible, for example,

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<sup>27</sup> Internal Company Environmental Management, Note for the Dutch Lower House, August 30, 1989, 20633, nr. 3, quoted in UNEP, 1992, From regulations to Industry Compliance: Building Institutional Capabilities, UNEP IE/PAC Technical Report 11.

<sup>28</sup> Moffet and Sax (1996), p. 115.

that reporting scrutiny will be sufficient to ensure acceptable levels of performance. In short, ISO 14001 may eventually stimulate the development of a number of alternative, non traditional focuses for environmental regulators as well as influencing the ongoing development and enforcement of Chinese environmental regulations.

## **5.0 ISO 14000 and Trade**

This section of the paper addresses the trade implications of the ISO 14000 series of standards. It is difficult to discuss trade implications at this time because the ISO 14000 standards are not yet complete and the ISO 14001 standard is just starting to be adopted. However, a framework for understanding likely trade implications of ISO 14000 can be constructed. That is what this section attempts to do.

The discussion of this section suggests that the trade implications of ISO 14000 will arise out of:

- the treatment of ISO standards in trade rules;
- the role that ISO 14000 standards will play in government procurement policies and the purchasing practices of multinationals and consumers as the standards become accepted in global markets;
- the impact that ISO 14000 will have on the design of eco-labeling programs and other government and corporate initiatives based on the life-cycle assessment decision tool; and
- the role that ISO 14001, the EMS standard, can play in preparing countries and companies for current and emerging policies and initiatives directed at SP&C that can have an impact on trade.

### **5.1 Trade Rules<sup>29</sup>**

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<sup>29</sup> Thorough discussions of the relevance of the WTO and the TBT to ISO 14000 are included in International Institute for Sustainable Development (1996) and European Environmental Bureau (1995).

ISO standards are likely to become increasingly important to international trade in part because of their treatment in the World Trade Organization (WTO). The Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary Standards (SPS) Agreements of the WTO require that countries base domestic regulations on international standards except where international standards would be an ineffective or inappropriate means for the fulfillment of the “legitimate” objectives of the domestic regulation.<sup>30</sup> The TBT Agreement specifically refers to the ISO and establishes rules for how mandatory “technical” regulations and voluntary “standards”, including those in the environmental field, should be developed, designed and implemented.

A Code of Good Practice for the Preparation, Adoption and Application of Standards is included in Annex 3 of the TBT Agreement. The Code applies to voluntary standards and essentially incorporates the obligations imposed under the TBT Agreement for mandatory technical regulations. Voluntary standards supported by national governments are required to comply with the code, and national governments must take reasonable steps to ensure compliance by sub-central governments and non-governmental standardizing bodies within their territories. The TBT agreement applies to all members of the World Trade Organization (WTO) and disputes arising under the agreement may be pursued under the WTO dispute settlement procedures.

It can be argued that recognition of ISO standards under the WTO affords these standards a special status for members of the WTO and will result in them becoming more important over time. Many observers suggest that ISO standards, will:

- constrain flexibility to develop environmental standards demanded by the public and that are appropriate to domestic circumstances since countries are urged to adopt international standards;
- result in pressure being placed on governments to not develop policies and regulations because voluntary standards produced by the ISO will be in place; or

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<sup>30</sup> The SPS agreement will not be discussed in this paper. This Agreement refers to the Codex Alimentarius which is an important international standards body involved directly or indirectly with human health and environmental issues. Any larger analysis of international standards that could impact China should also consider this organization.



- result in pressure to soften existing policies and regulations in ways that transfer more responsibility for environmental performance improvements to voluntary compliance without mechanisms being retained to ensure actual performance improvements.

As a result of these concerns, the ISO's work has recently become more political and more subject to scrutiny. The relationship between the WTO and the ISO will undoubtedly keep the ISO closely tied with current and emerging trade and environment issues. This relationship also points to the importance of countries, including China, staying actively involved in the ISO process.

The WTO will depend on the ISO to address some difficult standards questions where international harmonization is desired to avoid trade barriers and conflicts. The life-cycle assessment and eco-labeling standards of the ISO 14000 series already exist as two important examples of this relationship. There is concern that activities in these two areas have high potential to lead to unnecessary trade barriers if international rules/standards are not set.<sup>31</sup>

## **5.2 Procurement Requirements in Export Markets**

The ISO 14001 EMS standard will likely bring significant benefits to exporters who become certified to the standard and trade barriers for those who do not. These benefits and barriers will arise from governments, corporations and consumers requiring ISO 14001 certification before they will purchase products and services. For instance, many observers argue that if you are trading into Europe it will be essential to have ISO 14001, just as it is now essential to have ISO 9000 in the European market.<sup>32</sup> It is even possible that requiring ISO 14001 certification by suppliers will become a basic requirement in

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<sup>31</sup> Another example of this trend is the European Union (EU) ban on Canadian furs from animals caught with leg-held traps. In this case, the WTO has asked the ISO to handle a delicate issue. The EU ban clearly involves an extraterritorial process and production method (PPM) standard contrary to existing trade rules, but the ban is also a politically sensitive issue where the WTO does not want to be seen by environmental groups, mainly in the EU, as an anti-environmental organization. However, there are serious questions about the capacity of the ISO, given its structure and standard setting process, to resolve these types of value laden issues where the environment and trade rules appear in conflict.

<sup>32</sup> Kirkpatrick (1995) and several other authors mention this point.

some jurisdictions in coming years.<sup>33</sup> In short, governments and multinationals may routinely require ISO 14001 by suppliers with very few opportunities for exceptions.

The impact on foreign suppliers of procurement policies influenced by environmental criteria can be seen in the Scott Paper supplier challenge case study in Annex 2. The value of that case study is not in the type of product that Scott Paper sells, but in the lessons that can be learned about the systematic approach used by Scott Paper to assess foreign suppliers and then exclude suppliers that did not achieve specified environmental standards. Scott Paper developed the environmental standards through a systematic life-cycle assessment of its products. Increasingly purchasers are likely to require ISO 14001 as a minimum to differentiate between suppliers. However, it is also likely that they will look to other standards of environmental performance along the lines pursued by Scott Paper to provide additional differentiation between suppliers. Scott Paper undertook this initiative to answer environmental criticism in its major developed country markets, a circumstance that will become increasingly common for multinationals. Multinationals will compete on the basis of the total environmental quality of their products from cradle to grave, from suppliers to recycling or disposal.

### ***5.3 The Impact of ISO 14000 Standards on Other Environmental Policies***

Certain of the ISO standards are also important to trade because of the influence they will have on other environmental policies and initiatives. For example, as noted above, there has been a rapid increase in environmental labeling programs world-wide that will be influenced by the ISO standards on environmental labeling. These standards will establish new rules for the development of environmental labels that can impact trade. Trade impacts of environmental labels are most likely when process and production methods form part of the criteria for assessing eligibility for the label.

The life-cycle assessment standards in the ISO 14000 series will also have far-reaching significance because life-cycle thinking is an underlying concept and/or an applied tool

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<sup>33</sup> Kantardjieff et. al.(1995) and Johnston (1995) speak of this within the pulp and paper industry, and Tibor

for many environmental policies within government and business. For instance, life-cycle thinking underlies concepts such as eco-efficiency, industrial ecology, pollution prevention, environmental management systems, including ISO 14001, full cost accounting, extended producer responsibility, product stewardship, and green design (see Annex 3 for definitions of these concepts). These concepts are becoming influential in corporate and government environmental policy throughout the developed countries because they attempt to answer the desire of decision makers to improve the environmental performance of organizations (increasing efficiency, reducing resource use and minimizing wastes and polluting emissions).

The trade relevance of life-cycle assessment stems from the final phase of a life-cycle approach that addresses developing a plan to reduce environmental impact. For example, there could be a greater environmental benefit in switching to a different raw material in the manufacturing process. Or, possibly, switching to another supplier of a raw material who demonstrates fewer negative environmental impacts. The Scott Paper supplier challenge case study in Annex 2 is a good way to illustrate some of these points.

#### **5.4 ISO 14000 and Policies for Sustainable Production and Consumption**

ISO 14001 is but one element of the broader movement we are seeing around the globe towards sustainable production and consumption and environmental performance improvements more specifically. For this reason, it is likely that ISO 14001 alone will not be enough to address all the environmental performance and export trade challenges that countries and companies will face as environmental requirements in global markets evolve. It is important to keep this point in mind because, as noted above, some countries and companies may believe that ISO 14001 is the total solution to their environmental challenges at home and abroad.

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and Felman (1996) are among the several others who mention this potential impact of ISO 14000.

Most of the prominent international environmental organizations now have programs designed to encourage SP&C patterns that are looking well beyond ISO 14001. For instance, the OECD is helping define and evaluate the range of policy options available to promote greener commercial operations. Similarly, for the last four years, UNEP has collaborated to promote cleaner production on a worldwide basis by raising awareness of technology, exchanging information, strengthening capacity and supporting the establishment of National Cleaner Production Centres. International environmental agreements, such as the Climate Change Convention, are also influencing countries and businesses to move towards better environmental performance.

The Nordic countries, the Netherlands, Germany and Japan are current leaders in policies and activities targeted at improving corporate environmental performance, including integrating environmentally-conscious technology and products into their strategies for future industrial competitiveness.<sup>34</sup> Germany's leadership in this area is also very influential for developments in the rest of the European Union (EU). These leading countries have recognized that international trade, technological advantage, and quality employment prospects will increasingly be influenced by environmental issues.

One of the main lessons that can be drawn from an international scan of policies designed to encourage sustainable production and consumption, is that slow progress in certain countries will not provide any inherent competitiveness advantages to corporations and will likely involve many disadvantages. Slowness in adopting greener operations means that companies will enjoy fewer of the efficiency benefits associated with improved environmental performance. This could translate into lost trade opportunities, lower profits, less employment opportunities, and a dirtier environment.

The leading countries are actively seeking new areas and innovative ways for government to help business move to greener operations. Although appropriate interventions differ according to the particular structure of the economies and the various political and cultural traditions, a number of common themes can be identified.

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<sup>34</sup> Resource Futures International, *Green Design* (1996).

Green operations initiatives in the leading countries typically involve a mix of policy instruments and approaches. Generally, voluntary frameworks are tried first before development of regulations, taxes or charges. For instance, the Netherlands “Policy Document on Products and the Environment” stresses a voluntary framework, but does envisage supportive use of regulations and economic instruments as needed (Netherlands, 1994).

Where governments are intervening, they are focusing on articulating clear objectives by sector and then providing considerable flexibility as to how to achieve the objectives - either by means of voluntary challenge programs, negotiated agreements, or performance based regulations. Some governments are also making selective use of technology forcing and behaviour changing regulations. In Germany, for example, regulations remain a prominent means to advance greener products and services, especially in the area of recycling but with real potential for other regulations to be developed soon to pursue other SP&C goals. The 1994 *Closed Substance Cycle and Waste Management Act* requires radical changes in an attempt to move the economy from heavy reliance on waste disposal to one based on closed loop cycles.

China will need to watch closely these emerging policies to the extent that they bring environmental and economic benefits and challenges. Active participation in the ISO’s work and undertaking ISO 14001 certification will be important steps that will help China face developments such as supplier challenges, but ISO work will not be all that needs to be done. From a trade point of view, China will need to look in an integrated fashion at the entire range of its environmental activities directed at improving the environmental performance of industry (e.g. clean production auditing and ISO 14000) to assess the adequacy of these activities to prepare China’s export industries for emerging challenges and opportunities.

## **6.0 Choosing Industry Priorities for ISO 14001**

This section of the paper identifies elements of an approach for selecting industry priorities for ISO 14001 certification. The ISO 14001 standard will involve significant costs for industry, and governments assisting industry participation will not be able to move on all fronts at once. Therefore, a major challenge for governments is to choose industry priorities based on calculations about where best to make domestic environmental improvements, protect export markets and pursue new export opportunities.

It is worthwhile to note that China will have special difficulties in attempting to implement ISO 14001 in the growing township and village enterprises (TVEs) and the chronically indebted state-run enterprises. Most of the TVEs are located in rural areas, have few employees, use backward technology, and cause serious environmental pollution in rural areas. It is reported that about one-third of the country's more than 100,000 state-owned enterprises are chronic money losers. Excessive workforces and outdated technology and management approaches are the main reasons for their financial problems.

It will be financially difficult to implement ISO 14001 in both the TVEs and state sector. Nevertheless, introducing environmental management systems in these enterprises can help reduce their overall environmental impact and improve cost-efficiency by implementing new systems. However, ISO 14001 will only be a very small step. These enterprises will require other government policy instruments to move them towards better environmental performance, including domestic policy and regulations, economic incentives, exhortation and information, and direct government intervention, such as in the form of subsidies for restructuring.

### **6.1 A Priority Setting Approach**

An approach for selecting priorities for ISO 14001 certification would involve: 1) identifying industries with sensitive environmental issues; 2) disaggregating these industries to identify the companies that are most exposed to the environmental issues;

and 3) disaggregating the companies to identify facilities that are the greatest contributors to this exposure keeping in mind that ISO 14001 certification is done at the facility level.

An assessment of environmental issues enters into ISO 14001 priority setting in two ways. First, it may be that an industry, company or facility is posing significant risks to human health and the environment in China that are a priority to the government and will be reduced through better environmental management systems. Second, it may be that a company is exporting products with greater actual or perceived environmental significance and, therefore, greater exposure to the environmental concerns of purchasers in export markets. The first point reveals the need for an analysis of environmental impacts and needs within China and will not be discussed further here.

Regarding the second point, it was noted in Section 2.5 that the chemical, electronics, pulp and paper, and non woven industries have followed the development of ISO 14000 standards closely. This provides one strong indication of where companies are perceiving export trade exposure to environmental issues. However, there will undoubtedly be other Chinese companies that should be considered for priority action on this basis. One helpful way of identifying what these priorities might be is to look at certification activities in other countries that currently have a lead on ISO 14001 primarily for trade reasons. For instance, Table 2 provides a list of ISO 14001 sites in Japan as of July 1996. Similar lists could be constructed for other countries to make an assessment of current and emerging priorities.

Another helpful way of identifying priorities is an analysis of export profile. As noted in Section 5.4, the Nordic countries, the Netherlands, Germany and Japan are current leaders in policies and activities targeted at sustainable production and consumption and typically look for an environmental management system as a minimum requirement. With some exceptions, it is also these countries that experience the greatest environmental sensitivities of governments, the public and consumers, followed closely by the remainder of Europe and North America. Table 3 provides a brief summary of major Chinese exports to these markets. To make this table more

useful for selecting priorities would require a further disaggregation of these exports to identify the companies that were the major contributors to these exports (this work is better done in China). Facilities owned by these companies would be probable priorities for ISO 14001 certification.



**Table 2: List Of ISO 14001 (Draft Standard) Registered Sites In Japan As Of July 1996**

Plant/Site	Scope/Industry	Registrar	Date	Accredited By
Canon Utsunomiya	Lenz	SGS	Dec. 1995	SAS
Canon Oita	Camera	SGS	Dec. 1995	SAS
Ricoh Gotemba		JQA	Dec. 1995	UKAS
Sony Minokamo	Camera and video deck	JACO	Feb. 1996	UKAS
Fujitsu Nasu	Radio-communication and satellite system	JACO	Mar. 1996	UKAS
Sony Kisarazu	Video deck	JACO	Mar. 1996	UKAS
Nippon Steel Nagoya		JICQA	Mar. 1996	RvA
Tayota Takaoka	Vehicles	JICQA	Mar. 1996	RvA
Nihon Kengyo	Heat exchanger for energy systems	SGS	June 1996	SAS
NEC Shizuoka	PC modem	JQA	Feb. 1996	UKAS
NEC Kansai	Semiconductor	JQA	Mar. 1996	RvA
NEC Kansai Mizuguchi		JQA	Mar. 1996	UKAS
Nippon Precision Circuits	LSI test machine	SGS	Mar. 1996	SAS
Sony Ponson Sakado	Portable cassette deck	JACO	Mar. 1996	UKAS
Yazaki Keiki Tenryu	Gas meter and alarm	KHK	Apr. 1996	JAB
Nippon Sekiyu Negishi	Petroleum refining	SGS	Apr. 1996	SAS
Kansai Sogo Enviro. Center	Survey and analysis	SGS	May 1996	UKAS
Matsushita Denko Kooriyama		JACO	May 1996	UKAS
Kawazumi Chemical	Medical products	JET	June 1996	JAB
NEC Miyagi		JSA-Q	June 1996	JAB
IBM Japan Fujisawa		JSA-Q	June 1996	JAB
Dainippon Ink Chemicals	Pigment and medicine	JQA	July 1996	RvA



**Table 335 : China's 1994 Exports in Million USD**

Commodity	World Exports (total)	Selected Trading Partners						
		Asia			North America		Europe	
		Asia (total)	Hong Kong	Japan	North America (total)	US	Europe (total)	Germany
clothing and accessories (SITC #84)	23 731	15 275	7 534	5 921	3 505	3 202	3 829	942
textile yarn, fabric, etc. (SITC #65)	11 818	8 867	5 109	1 455	855	728	1 182	275
telecomm. sound equipment etc. (SITC #76)	6 744	3 310	1 634	993	1 877	1 820	1 222	413

<sup>35</sup> all data taken from *Commodity Trade and Statistics 1994*. United Nations Statistical Papers Series D Vol.XLIV, No.1-07. China Rev.3.

**Table 2 Continued....**

chemicals (SITC # 5) (includes organic chemicals, inorganic chemicals, medicinal or pharmaceutical products, dyes, colouring materials, essential oils, perfumes, plastics, and all fertilizers except crude or minerals fertilizers)	6 236	3 641	1 200	773	694	641	1 558	433
footwear (SITC #85)	6 042	1 476	510	518	3 272	3 186	980	217
elec. mach. appar., parts, NES (SICT # 77)	5 928	3 784	2 190	663	1 141	1 090	786	268
baby carriage, toys, games SITC # 894)	5 136	1 654	1 050	352	2 275	2 185	1 026	270
metals manufacturing, NES (SICT #69)	3 604	1 799	869	265	746	683	761	262
office machines, ADP mach. (SICT # 75)	2 664	1 295	617	347	740	722	592	280

## 7.0 Conclusions

The analysis in this paper leads to four broad conclusions on the strategic issues for China associated with ISO 14000.

*First*, many important issues are unresolved in the ISO 14000 process. In particular, the product oriented standards for environmental labeling, life-cycle assessment, and environmental characteristics of product policies are still being developed. To this point, the ISO process has been dominated by industry from OECD countries and has under-represented developing countries and public interests groups.

*Second*, ISO 14001 provides an excellent opportunity to improve the environmental performance of companies. There is growing experience internationally that systematic approaches to improve corporate environmental performance (increasing efficiency, reducing resource use and minimizing wastes and polluting emissions) can improve government relations and public image in the market, reduce costs and expand market opportunities. However, because ISO 14001 does not establish performance standards on its own, the amount of environmental performance improvements will depend on the strength of a company's environmental policy and the domestic environmental policy regime. There is also a cost barrier to implementation of the standard, particularly in small and medium size enterprises.

*Third*, the ISO 14001 standard can be an important tool in domestic environmental management regimes. It can improve compliance with domestic environmental policies and regulations and help export industries deal with environmental challenges in foreign markets. Environmental regimes and economic performance are linked because the environment increasingly influences competitiveness in important export markets.

*Fourth*, it is likely that ISO 14000 standards will become increasingly important to international trade arising from:

- the treatment of ISO standards in trade rules;
- the role that ISO 14000 standards will play in government procurement policies and the purchasing practices of large corporations and consumers as the standards become accepted in global markets;
- the impact that these standards will have on the design of eco-labeling programs and other government and corporate initiatives based on the life-cycle assessment decision tool; and
- the role that ISO 14001 can play in preparing countries and companies for current and emerging policies and initiatives directed at SP&C that can have an impact on trade.

These conclusions lead to certain recommendations for China. China has an opportunity to maximize environmental and economic benefits and lesson possible trade barriers of ISO 14000 by:

- adopting the ISO 14001 EMS standard aggressively in priority sectors, including by working with small and medium size companies;
- using the ISO 14001 system to begin preparing companies for the other environmental challenges they will face arising out of current and emerging SP&C policies;
- working with companies to improve their environmental policies so as to improve the environmental performance of the country;
- ensuring that the domestic environmental regime works with ISO 14001 to promote actual environmental performance improvements; and
- actively participating in the ongoing ISO process that is still producing product oriented standards, (e.g. environmental labeling and life-cycle assessment standards), that will be important to trade and environment issues in the coming years.

## **Annex 1: Prominent International Eco-Labels**

### ***Asia and the Pacific***

Australia

Environmental Choice Australia

Year of establishment: 1991

China

China Environmental Labeling Scheme

Year of establishment: 1994

India

Eco-Mark Scheme

Year of establishment: 1991

Indonesia

Ecolabeling Scheme Indonesia

Year of establishment: 1993

Japan

Eco-Mark Scheme

Year of establishment: 1989

Republic of Korea

Eco-Mark Scheme

Year of establishment: 1992

New Zealand

Environmental Choice Scheme

Year of establishment: 1990

Singapore

Singapore's Green Labeling Scheme

Year of establishment: 1992

Taiwan, China

The Green Mark Program

Year of establishment: 1992

Thailand

Thai Green Labeling Scheme

Year of establishment:

### ***Europe***

Austria

Austrian Eco-Label

Year of establishment: 1991

Croatia

Environmentally Friendly Scheme

Year of establishment: 1993

Czechoslovakia

Environmental Friendly Product Labeling

Year of establishment: 1994

Denmark

Joint EU Eco-labeling Scheme

Year of establishment: 1992



Finland

Joint Nordic Environmental Labeling Scheme

Year of establishment: 1991

France

NF-Environment

Year of establishment: 1991

Germany

Blue Angel Scheme

Year of establishment: 1977

Ireland

Joint EU Eco-Label Scheme

Year of establishment:

Luxembourg

Joint EU Eco-Label Scheme

Year of establishment:

The Netherlands

Stichting Milieukeur

Year of establishment: 1992

Norway

Joint Nordic Environmental Labeling Scheme

Year of establishment: 1989

Portugal

Joint EU Eco-Label Scheme

Year of establishment:

Spain

AENOR Medio Ambiente Label Program

Year of establishment: 1993

Sweden

Joint Nordic Environmental Labeling Scheme

Year of establishment:

&

Good Environmental Choice (Bra Miljoval)

Year of establishment: 1992

United Kingdoms

Joint EU Eco-Label Scheme

Year of establishment: 1992

**America**

Canada

Environmental Choice Program

Year of establishment: 1988

Colombia

Sello Ecologico

Year of establishment:

Brazil

Brazilian Green Seal

Year of establishment:

The United States

Green Seal

Year of establishment: 1989

&

Scientific Certification Systems

Year of establishment: 1984

### ***Intergovernmental and International Programs***

European Union

EU Eco-Label Scheme

Year of establishment: 1992

The Nordic Council

Nordic Environmental Label

Year of establishment: 1989

ISO

ISO 14000 Eco-labelling Guidelines

Year of establishment: still in the development process

Forestry Stewardship Council (FSC)

FSC Eco-Label for forest products

Year of establishment: 1995

## **Annex 2: The Scott Paper Supplier Challenge**

From 1990 to the present, Scott Paper, U.K. has undertaken an initiative referred to as the supplier challenge which reveals the use of life-cycle assessment in corporate decision making that can impact suppliers.

Scott produces various forms of tissue paper (bathroom, kitchen towels, facial tissues, etc.). By 1990 the company had become aware of the increasing importance of environmental concerns as a factor in its customers' purchasing decisions (based on questions about recycling, chlorine bleaching and other issues). To address this issue, the company decided it could either launch a line of "green" products or improve the environmental performance of its overall operations. The green product line was not considered to be a serious option as it would raise concerns about the other Scott products that are not "green".

### ***Use of LCA***

In 1990, Scott conducted a life-cycle analysis of its products from the forests through to disposal, and it became clear that when buying raw materials, the company was buying environmental impacts. The greatest improvement in the environmental performance of Scott's products would result from changes in the raw materials.

Scott then collected information from all of its suppliers that related to the raw materials' impacts on climate change, acid rain, and other environmental problems. Each supplier provided Scott with information on emissions, on energy consumption and energy sources, etc. Scott then processed the information and provided individual suppliers with a bar chart on each type of emission, with only that company's name indicated. In this way, Scott obtained information from all of its suppliers, and each supplier could compare its performance with its competitors (although not by name). This information gathering process was carried out in 13 manufacturing locations across Europe and the suppliers were very cooperative (which is not surprising in view of

Scott's substantial purchasing power). The range of emissions for interchangeable materials was much broader than expected - materials from some suppliers resulting in up to seventeen times the emissions of comparable materials from other suppliers.

### ***Development of Environmental Performance Measuring Tools***

With all of the data in hand, Scott confronted the classic LCA problem - how to combine the various types of emissions to determine an overall score. Scott did not consider himself competent to carry out this task and established round table groups that used decision analysis techniques to reach consensus on how to score the various types of emissions. The groups were made up of environmental experts - legislators, academics, environmental journalists and some non-governmental organizations (those which were not single issue pressure groups). This process took about two years.

Once the "measuring stick" for environmental performance had been established, Scott made a policy decision that the raw materials in the bottom 10 percent of environmental performance were not acceptable. Suppliers were informed of this decision and given "a reasonable amount of time" to address their problems. Within the 90 percent group that had acceptable environmental performance, preference was given to those who scored the highest on environmental performance in combination with cost, quality and customer service.

### ***Impact of Supplier Challenge***

Scott's suppliers are located in various countries around the world. A number of suppliers were dropped by Scott as the changes required to improve their environmental performance were too great to be dealt with in the short term. However, these suppliers continued to update Scott on their progress. All current suppliers provide emissions data annually to Scott for review. Companies that barely make the 10 percent hurdle know they have to implement some improvements in order to continue supplying Scott with raw materials.

Scott's initiatives also influence suppliers to the rest of the paper industry - "what the tissue companies are asking for today, the rest of the paper industry will be asking for tomorrow".

It is difficult to measure direct impacts of reduced environmental impacts on consumer choices. Scott found through its market research that customers' perceptions of the environmental characteristics of Scott's products, as opposed to its competitors', rose considerably as a result of the proactive initiatives. An effective communications campaign is crucial for the efforts to result in an enhanced company image and increased sales - the principal reasons that a company undertakes such initiatives.

It should be pointed out that the cost to Scott of improving the environmental performance of its products through the supplier challenge was minimal. An important result of this approach is that environmental considerations are now an integral component of Scott's decision-making processes.

### ***Government Role in Supplier Challenge***

To set the environmental priorities at the outset of the supplier challenge, Scott questioned all member states of the European Union as to the relative importance of the various environmental issues, and experienced difficulty in obtaining guidance in this area. In setting its priorities, Scott wanted to be aware of: the overall importance of the environmental issue, how great a contribution Scott was making to this problem, and Scott's potential opportunity to diminish the problem.

It was concluded that governments could assist such initiatives in two ways: by providing guidance with respect to environmental priorities, and by acting as opinion leaders through communicating these priorities to the public.

### ***Next Steps***

Following the analysis of emissions related to raw materials, Scott took its initiative one step further by studying the forest management practices of its suppliers. Scoring criteria were developed, and forest management practices are now considered as well in supplier selection.

The next step for Scott will likely be to study its product design in greater detail in order to identify further potential areas of environmental improvement.

## **Annex 3: Concepts Applied in Devising Environmental Product Policies and Practices**

### ***Life cycle assessment and management***

Life cycle assessment is a conceptual approach to account for the environmental impacts of a product, process or service throughout its lifecycle - from “cradle to grave.”

Lifecycle management emphasizes minimizing those effects across the full lifecycle.

Life-cycle thinking is an underlying concept and/or an applied tool for each of the other concepts listed below.

### ***Eco-efficiency***

The World Business Council on Sustainable Development describes eco-efficiency as a management direction that enables business to become more productive and environmentally responsible through reducing the use of energy and resources and minimizing waste. The key elements are: 1) reduce the material intensity of goods and services; 2) reduce the energy intensity of goods and services; 3) reduce toxic dispersion; 4) enhance material recyclability; 5) maximize sustainable use of renewable resources; and 6) extend product durability and service intensity.

### ***Industrial Ecology***

The goal of industrial ecology is to link the inputs and outputs within and across industries, forming closed-loop flows of material and energy, thus minimizing the use of virgin resources and producing less waste.

### ***Pollution prevention***



There is an emerging consensus among policy makers and business that “anticipate and prevent” is a more effective and efficient strategy for addressing environmental problems than “react and cure.” As a result, pollution prevention themes underlie many new environmental laws and policies as well as many business strategies.

### ***Environmental management systems***

Businesses are increasingly focusing on developing environmental management systems (EMSs) that are integrated into their ongoing business planning processes. Similarly, policy makers, financial institutions and the courts are starting to emphasize the importance of EMSs as a means to minimize potential environmental liabilities.

### ***Full cost accounting***

Both policy makers and businesses implementing stewardship programs are refining methods for estimating the full costs of an activity, including the “external” environmental costs not paid for by the user or producer.

### ***Extended Producer Responsibility/Product Stewardship***

Product stewardship focuses on making environmental issues a priority for manufactures, across the product life-cycle. For businesses, this is a significant shift in decision-making.

Various governments have recently implemented laws and policies based on “extended producer responsibility,” the principle that manufacturers bear some responsibility for the environmental impacts of their products throughout their life-cycles. End-of-life concerns from the disposal of products have been the initial focus for many governments, but the concept is gaining momentum across the whole life-cycle. Approaches being promoted include concepts where the producer maintains ownership of the product, choosing to sell the service only. Reusable crates and pallets which

remain the property of the shipper of distributor are one already widespread example relevant to the shipping industry.

## ***Green design***

Green design involves systematic consideration of environmental objectives and factors during the design stage of developing new products, services or production processes. Other terms for "Green Design" are "Design for Environment (DfE)", "eco-design" or "green by design". The goal of Green Design is to reduce the environmental impacts of producing and consuming products from the outset, and *over their entire lifecycle*. On this basis green design issues figure prominently in policy frameworks such as the Netherlands "Policy Document on Products and the Environment" (Netherlands, 1994). Once a product or process moves from the drawing board into production, its environmental attributes are largely fixed, subject primarily to how it is used and disposed of. The key, therefore, is to improve capacities to integrate *at the design stage* environmental objectives with other more traditional product and process design objectives.

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