

Environmental management in
transnational corporations in China

By

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Cross Border Environmental Management
in Transnational Corporations

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Background to the paper

The globalization of economic activity in general, and the growing role of transnational corporations (TNCs) in particular, has increasingly directed attention toward the environmental consequences of these developments. Increasingly, TNC activity in developing countries has become an issue for various normative initiatives at the international level, in the OECD and in the WTO. However, there remains a pertinent need to gain a better understanding of the environmental implications of TNC activity in developing countries. On this background, the United Nations Conference on Trade and Development (UNCTAD) and Department of International Communication and Management, Copenhagen Business School (DIM/CBS) in 1997 received a grant from the Danish International Development Agency (DANIDA) to conduct a study of environmental practices in TNCs. The project is called: «Cross border Environmental Management in Transnational Corporations». The project examines environmental aspects of foreign direct investment (FDI) in less developed countries by conducting case studies on environmental practices in Danish and German TNCs with operations in China, India and Malaysia. The project will produce a series of research reports on cross border environmental management seen from home country, host country as well as corporate perspectives. The reports will serve as input to a conference on Cross Border Environmental Management hosted by UNCTAD.

Abstract

This paper examines the environmental practices of European TNC affiliates in China. Based on the information collected from a questionnaire survey and case studies of individual TNC affiliates, the paper provides a comprehensive picture of the state of TNC environmental management systems in China and offers case stories of environmental management initiatives. The authors argue that the nature of environmental management systems is industry and plant specific and that it thus is difficult to generalize regarding environmental management practices. Nevertheless, it is documented that all TNC environmental management systems, regardless of industry and plant specific factors, are poised between localizing and globalizing forces. Thus it is concluded that the two dominant forces affecting TNC environmental practice in China are on the one hand the host country's institutional factor (current regulation or future regulatory prospects) and on the other hand headquarters' environmental policies and practices.

Please note that the views and opinions expressed in this paper reflect those of the author and do not necessarily represent those of UNCTAD and CBS.

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1. Introduction

1.1 Role of FDI in China

Over the past two decades, FDI inflows into China has experienced rapid growth, so that actual FDI inflow increased from 0.916 US\$ Billion in 1983 to 45.582 US\$ Billion in 1998. The surge of FDI inflows has been a crucial factor in China's economic development in the 1990s. Foreign direct investment in poses significant influences in various fields of the Chinese economy. It has contributed to economic growth and development by bringing in financial resources, technology, management know-how, and by generating employment, upgrading workforce skills and promoting exports. It has also facilitated the introduction of market-oriented reforms. On the other hand there are some problems and impediments that closely relates to FDI in China, such as regional imbalances of FDI, abuse of transfer pricing, and environmental damage (Xian, G. et al, 1999). With the rapid expansion of foreign affiliates in China and the continuous inflow of FDI, the concerns regarding the effects of FDI are expected to increase in future. Environmental aspects are prominent among those concerns.

1.2 Issues to be explored

The outstanding economic growth exerts considerable pressure on China's environment. Ensuring economic prosperity while sustaining the environment are the central tasks. With foreign affiliates' increasing share of the economy, their environmental performance may make great positive contributions to improving environmental conditions but they may also seriously impede environmental improvements. The result to a large extent depends on foreign affiliates' environmental practice.

Table 1: The role of FDI in China

	1985	1990	1997
FDI inflow as % of total fixed investment	2.25%	3.69%	14.8%
Employees in foreign affiliates as % of urban employed persons	n.a.	0.4%	2.88%
Share of exports by foreign affiliates in total exports	1.08%	12.6%	47%
Share of industrial output by foreign affiliates in total industrial output	0.3%	1.6%	18.6%
Share of pre-tax profit of foreign affiliate in total industrial pre-tax profits	n.a.	n.a.	17.28%

Source: James X. Zhan (1999); China statistical yearbook 1998; China industry statistical yearbook, various years.

Previous studies give us an ambiguous and incomplete picture of environmental management practices in China. From the scant evidence it appears that affiliates' environmental performance differs from one another, even though they are operating under the same environmental regime. Some have introduced advanced environmental products and production process, taken a lead in adopting international environment standards, and built infrastructures for environmental protection. Other affiliates appear to have transferred environmentally inferior technologies or products thus causing serious pollution in China (Xian et al 1999). Thus it is necessary and important to know, why different environmental practices are adopted by the affiliates respectively, and how TNCs coordinate and conduct their environmental activities across borders.

This paper aims at enhancing the understanding of TNC cross border management systems and their affiliates' environmental behavior in China. The issues studied include: How are TNCs' in China balancing the needs for adaptation to local conditions with the needs to co-ordinate at a global scale? To what extent and why are

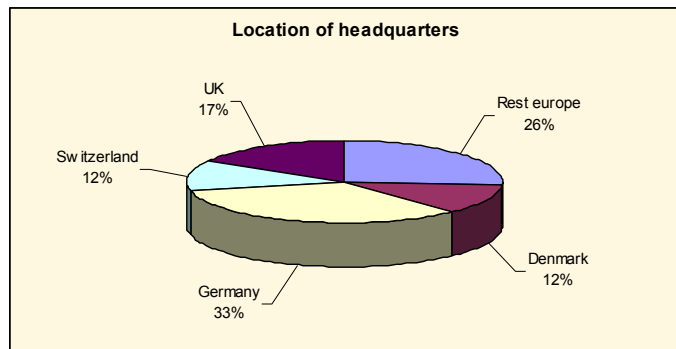
TNCs' environmental management systems in China influenced by the corporations' need for global co-ordination? And what are the potential wider implications for environmental protection in China of TNCs' environmental practices?

1.3 The research setup

In accordance with the overall design of the research program 'The Cross Border Environmental Management Projects', this study focused on TNCs with headquarters in Europe, particularly those from Denmark and Germany. The research concentrated on the affiliates' environmental practice. Data were collected from two sources, questionnaire feedback and case interviews with affiliate managers and related stakeholders. More than 300 questionnaires were sent out to the European owned affiliates in China. With help of telephone follow up and on site meeting, 42 responses were obtained.

Seven firms (4 from Germany, 3 from Denmark) were chosen for detailed case interviews. They are Company A (a producer of paints located in the Jiangsu province), Company B (a producer of ingredients located in the Jiangsu province), Company C (a producer of detergents located in Tianjin), Company D (a cosmetics firm located in Tianjin), Company E (a pharmaceutical firm located in Tianjin), Company F (a producer of fine chemicals located in the Jiangsu province) and Company G (a producer of pesticides located in Tianjin). Company B produces functional ingredients for food products. The

other six firms are chemical companies, with products ranging from enzymes, pesticides, paints detergents, and other chemical products.



The detailed case studies

were conducted to obtain more specific information that is not easily handled through standard benchmarking based on a questionnaire. The information is extensively used throughout this report.

Sample firms for the survey were selected mainly from firms listed in China Foreign Trade and Cooperation Yearbook (various years). Sampling criteria were that the investment of each sample firm is not less than 1 million US\$; all of them are affiliates

of European based firms or their ultimate control is from headquarters in Europe; and that the affiliates have potential pollution impacts.

The sample firms were relatively concentrated in Tianjin, Shandong, and the Yangtze River delta region. The case firms mainly came from Tianjin and Yangtze River delta region. There are two reasons: first, these areas are both major FDI receiving areas and many especially chemical TNCs have established subsidiaries in these regions. Secondly, it was easier for the researchers to get in touch with the managers due to close linkages to the local government and the companies in these regions.

2. Profile of the sample

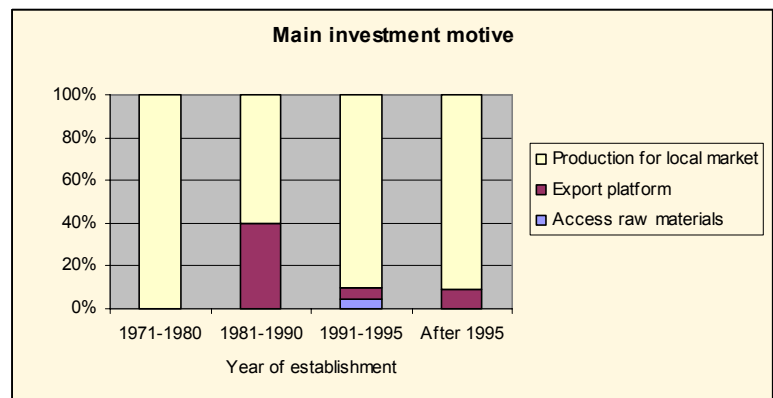
2.1 General description of firms

In this section a general description of the profile of the sample will be provided:

2.1.1 Investment motives

Investment motives differ from firm to firm. Some firms reported that they had invested in China to reduce cost by using the cheaper labor force. Typically such affiliates are using China as an export platform to service regional or global markets. Some firms are resource motivated; they located their affiliates close to natural resource reserves. But most of foreign affiliates in China are market oriented. Market oriented investments are undertaken in order to follow major industrial customers, bypass trade obstacles, or establish a presence in a potentially huge market.

An investment decision usually has more than one motive. Many sample firms (68%) mentioned more than one motive for the investment



decision. With 83%, the most frequently cited primary investment motive is the production for domestic market. 12% reported lower production cost as the primary

investment motive; 52% cited this motive as among their three most important investment motives.

None of the sample firms mentioned differences in environmental controls or standards between China and European countries as an important factor for their investment. Only a paints factory (Company A) indicated that it originally had considered to locate its plant in Shanghai, but due to the stricter environmental controls there, Kunshan was chosen instead. This implies that environmental controls had some influence on the choice of investment location among various places in China.

It is clear that the rapid growth in TNCs' investment in China mainly is based on accessing China's expanded market and the good economic development perspectives of China.

Motives to invest in China

In May 1999, Company B, an ingredients factory in China started operation. The plant located in Kunshan, Jiangsu province. The products are mainly designed to supply the rapidly expanded Chinese market. When talking about why choosing Kunshan, the general manager said that "in Kunshan we have found a location where we are close to important suppliers of vegetable oils, fat and glycerine, where the local infrastructure is well-developed with good roads and transport opportunities by rail and river, and where, with its close proximity to Shanghai, we can attract employees with the right qualifications."

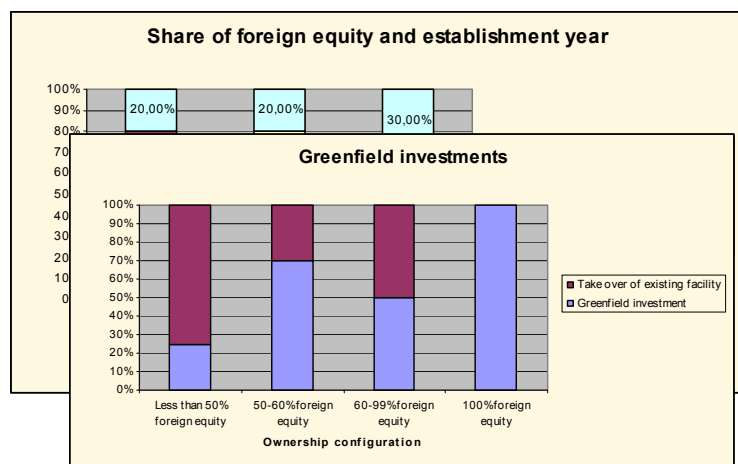
When asked about the relation between location decision and

In earlier 1990s, the world economy experienced a slow or even negative growth while China sustained high growth rate. This consolidated TNCs' confidence in China's economic future, and spurred strategic investment in China in the 1990s.

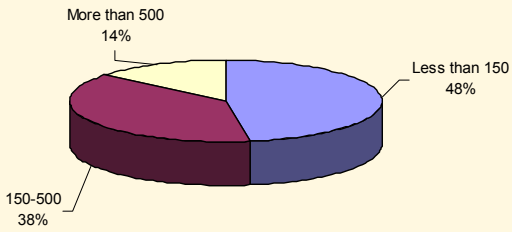
Low environmental control costs thus do not provide a sound explanation for growing FDI inflows in China. If it was an important factor affecting investment decisions, FDI should with similar speeds flow to other developing countries where lenient foreign investment policy and environmental controls also are present.

2.1.2 Foreign equity shares

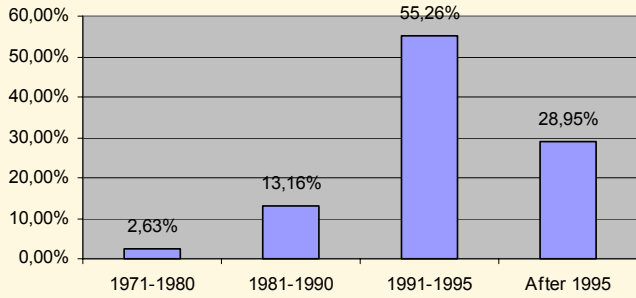
About 90% of the sample firms are majority owned foreign subsidiaries, and 26% are wholly foreign owned firms. TNCs tend to increase their equity shares when the market is promising and there



Number of employees



Year of establishment

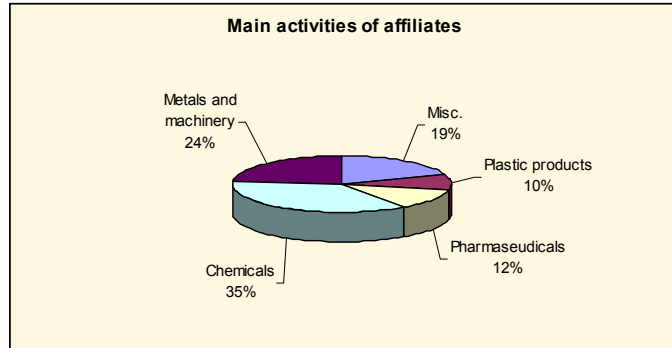


strategy (Castlem an, 1985; G ledw in, 1987). Other scholars

^① Xu Ming (ed) (1997) *Crucial moment: 27 urgent problems to be solved in China*, China Today Publishing Co. Beijing, pp.331-350

3.1.2 Potential pollution problems in sample companies

The potential pollution problems typical for industry include wastewater, air pollution, and solid waste. In the 42 sample companies, 35% are in the chemical industry and 12% in pharmaceutical industry. Such companies frequently are involved in manufacturing or handling of hazardous chemical compounds such as alkali, acids and inorganic pigments representing significant environmental hazards if released untreated. For the other manufacturing firms in the sample, electroplating, incision, heating & washing processes may cause environmentally negative impacts.



Concerning wastewater, firms in chemical and other manufacturing industries use large amounts of water. This is largely applied in processing, cooling and washing process. For the chemical manufacturing firms, water often becomes contaminated with chemicals or byproducts. Pollutants may include toxic pollutants and substances with high biochemical oxygen demand (BOD) and chemical oxygen demand (COD). Some chemical products may increase environmental load on the surface water after use, such as detergents. For other manufacturing firms, the negative effects of the washing procedure are also significant. Contaminated water, if released without proper treatment, will in pose negative influences on surface water resources.

Depending on the process used, air pollutants include particulate matter and a great number of gaseous compounds including sulfur oxides, carbon oxides and nitrogen oxides from boiler fuels and process furnaces, nitrogen compounds and chlorinated compounds. These emissions result from several sources including process equipment, storage facilities, valves, vents and leaking seals, etc.

Solid wastes generated by our sample firms may include residuals from raw materials, waste polymers, tank cleaning or pollution control equipment, as well as ash from coal boiler operations. Waste material may be contaminated with chemical substances from the processes. Consequently, waste disposal procedures must be handled in an environmentally responsible manner to avoid harm and degradation in local communities.

3.2 The environmental protective measures taken at local plants

Environmental protective measures consist of two different categories. One is related to managerial methods. The other is related to technical methods to handle the environmental hazards. Although they are inseparable, a distinction between them is useful in order to understand environmental practices of the affiliates in China.

3.2.1 Technologies to combat pollution

In China major projects must conduct an environmental impact assessment before its construction and projects' approval. In the environmental impact assessment, the investors are required to evaluate the impact and take compatible measures to minimize the negative impacts.

The case firms generally installed proper equipment to avoid environmental hazards. They installed measures to control wastewater effluents. These measures include tanks that are neutralizing potential hazards. Further efforts were made to mitigate the hazards through evaporation, flotation, filtration, oil separation, carbon absorption, ion exchange, reverse osmosis, biological treatment.

Company E, a pharmaceutical company located in Tianjin, established its own waste disposal facilities to handle the wastewater in order to comply not only with China's relevant standards but also with corporate environmental policy. In the environmental protection design, the plant in China followed the same standards as those required in Europe and US. In order to conserve water resources, production process refrigerant water is reused through an insulated circular system. At the same time waste residue was separated from the wastewater and utilized to produce a high quality fertilizer which was providing to adjacent peasants free of charge.

Company F, a German company in the electronics industry located in the Shanghai region reported that it had spent about 250,000 US\$ for a state-of-the-art wastewater treatment facility. The water released is much cleaner than required by national standards. In other subsidiaries of this company, incineration equipment was installed to deal with waste liquid and gases.

In some affiliates (16 firms), certain waste disposal activities, such as wastewater treatment, garbage disposal etc are contracted out. In the large cities there are wastewater treatment plants, mainly state-owned enterprises, that offer this kind of service. But due to capacity shortage and the poor quality of many public facilities,

much of the wastewater is only given preliminary treatment. In some regions there are no treatment facilities at all. Here enterprises are encouraged to establish their own wastewater treatment plants. In some companies, like company G in Tianjin, wastewater treatment activities were contracted out to the Chinese partners. Outsourcing environmental protection activities in this manner in poses more burden on the weak environmental protection capacity in China.

It was expected that TNC affiliates in China cooperate with other companies to establish common effluent treatment plants to gain from economies of scale. But the result differs from the expectation. Only 5 firms indicate that they have common effluent treatment plant in China.

3.2.2 Modifications of processing technologies

Most of the TNCs affiliates opt to adapt China's environmental requirement, implemented the similar process technologies and environmental protective measures as the local companies.

But we also found a few examples of TNCs in importing state-of-art technology particularly for water purification or made some modification to the old process technologies.

Modification of process technologies

Company C has made a lot of efforts to control pollution. In its Tianjin plant it abandoned some products. In 1993, it closed a plant to reduce oil content and overcome PH in waste water. In 1996, it closed liquid detergent plant to reduce LAS in waste water. In the company's Guilin plant, the steam generation has been modernized. Instead of coal, oil is now the preferred fuel. The new boiler emits only 75 metric tons of sulfur dioxide per year instead of the previous 625. Although the old coal-fired boiler was fitted with a

Beyond the elimination of hazardous organic chemical compounds, the new technologies allow recycling the water or other resources. For example, the energy generated in the incinerator is recycled and used in adjacent manufacturing processes. In other cases, we found examples of efforts to recycle and reuse processing water after treatment. Through purification methods pollutants are removed and industrial water is recycled and reused in chemical processing at the local plant.

3.2.3 Environmental management measures

Environmental management is broadly understood as the standards, procedures and practices that a company sets up to manage environmental challenges. Typically, an environmental management system consists of various objectives for environmental performance, procedures for control and enforcement, and a formal allocation of responsibilities among employees and functions (Hansen, 1999).

Most TNCs have adopted formal environmental policy statements indicating a commitment to promote environmental protection and natural resource conservation. Some TNCs mention the applicability of the policy, for example, that it is suitable for all subsidiaries around world, or that it applies to majority owned affiliates only.

In line with this it was found that many affiliates have a written environmental policy in place. According to our benchmark survey, as many as 83 per cent did respond positively to whether an environmental policy was in place. In the 7 case companies, 5 had adopted at least a brief environmental policy commitment - even if it may not be formally stated as an 'environmental policy'.

General speaking, the environmental policy is not that specific. They give a brief statement about companies' attitude toward the environment. Company C states: 'Company C is committed to developing and supplying products and systems yielding optimal benefits to its customers worldwide. Product performance, quality and safety are integrate parts of Company C's policy of product stewardship. Company C is committed to running its plants safely, protecting the health of its employees and neighbors, and preventing or minimizing negative impacts on the environment.'

The environmental policy statements are necessary but if there were no specific objectives or procedures to carry out the policy, all the statements may be in vain. In this regard we found that some companies have formulated specific objectives and management procedures to specify environmental policies. Objectives were mainly set in the following fields: conservation of energy, water or other resources, wastewater disposal minimizing target, air pollution, and compliance with the local regulations. In some cases, a plan to fulfill the objectives is also made.

Operating rules related to worker safety and environment is also important. In some firms, environmental protection is integrated into the operating rules that guide the employees activities in production, distribution and purchasing.

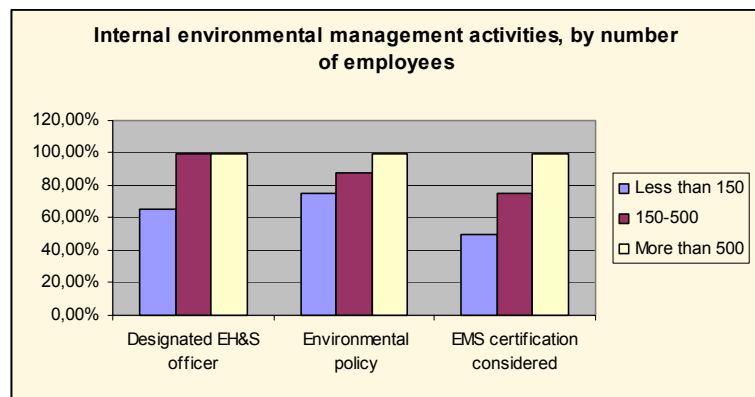
The environmental policy, objectives and the operating rules should be widely understood by employees. Therefore some companies developed their environmental training program. This kind of training is important to enhance the employees' environmental awareness. 60% of the affiliates reported to have such programs in place.

Environmental protection is a long lasting task, it can not be accomplished without

designated managers. The facts that 83% of the TNC affiliates have a designated EH&S officer and that 74% have a health and safety committee indicates that some form of institutional step is taken. However, only 8 affiliates have taken the further step of having their environmental management system certified according to an environmental management standard. ISO 14000 is increasingly functioning as a benchmark for corporate collaboration. Normally ISO 14000 is assumed to be a reflection of environmental consciousness within particular markets. Companies that have achieved certification may have demonstration effects on other firms.

Interestingly, 2/3 of the 42 affiliates in China had been or was considering to become certified according

to an environmental management standard. Quality management and EH&S



management systems have many elements in common. Therefore most case firms integrated both dimensions into plant manuals or documented work instructions.

In general, the scope and content of environmental management systems were strongly correlated with the industry of the affiliate as well as with the size of the affiliate measured in terms of employees.

3.3 The degree of formalized transnational environmental control from HQ

Although affiliates' environmental management practices in some areas vary significantly, it appears that the affiliates' environmental practices, particularly the standards, guidelines and procedures of environmental enforcement, are strongly connected with the parent company's environmental management system.

3.3.1 Cross border environmental management systems in TNCs

Typically TNCs have their own environmental management system to attain environmental commitments. The headquarters outlines the overall principles of the environmental activities for the whole corporation. Targets and objectives are

presented in these principles. In some instances, subsidiaries will be required to comply with a corporate standard. In other instances affiliates are merely asked to comply with regulation of host countries. Apart from the environmental policies and standards outlined by headquarters, TNCs' cross border environmental management systems may contain various procedures for monitoring and controlling subsidiaries' environmental behavior. These procedures include pre-acquisition assessments, environmental reporting and environmental audits. TNCs' environmental management system may also contain training programs and information exchange activities aimed at providing environmental guidance and facilitate awareness at affiliates. TNCs' environmental management systems will be embedded in a formal organization responsibility and functions are designated among various levels.

3.3.2 Environmental policies, environmental standards, environmental guidelines

HQ's environmental management systems appear in our sample to have significant impact on the subsidiaries in China. First, the affiliates' environmental policy is usually duplicated from HQ's environmental policy statement. In the sample firms, 84% have their own environmental policy. Of those, 74% reported that the environmental policy was formulated by headquarters. Second, some TNCs also set specific environmental standards for their affiliates in China. According to one case firm (Company C), 15 corporate EH&S standards were defined. The standards set the basic requirements about the commitment, management & resources, communication, manufacturing, workplace, resource consumption & releases, products, distribution, training, emergency preparedness & response, supplier & contractors, acquisitions & divestments, reporting on performance, regulatory & other external requirements, and verification.

The standards are further reinforced by more specific guidelines formulated by headquarters. These guidelines are mandatory and apply to all subsidiaries. For example, an inventory of hazardous materials must be compiled, emissions must be measured, the results of the measurements must be documented, the emissions must be ecologically and toxicologically analyzed, and if necessary improvement programs must be drafted and applied.

When EH&S officers at the subsidiaries or plants integrate the requirements of the standards and guidelines into the documented procedures, site-specific factors (such as the range of products manufactured there and local regulatory requirements) are

taken into account, responsibilities of specific employees are assigned, and applicable work instructions are defined (Company C environmental report). In this way, the corporate environmental policy and commitment was conveyed to the whole corporation and implemented.

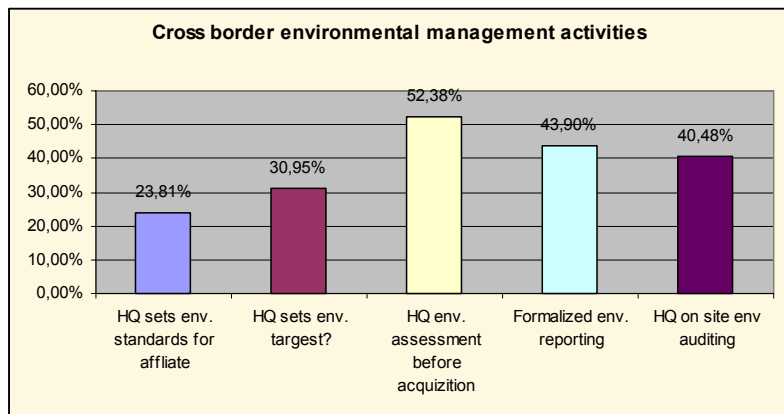
In addition to that, some TNCs also set certain environmental targets for their affiliates, mainly in the area of wastewater reduction and resources conservation. For example, Company C is required to reduce its wastewater by 8% (relative to 1998) in 1999. 30 percent of the local affiliated units report that they are following environmental targets set by corporate headquarters.

In one case firm (Company E), HQ has established an environmental network, which sets out overall principles and environmental objectives for their affiliates in China. The targets are the same for every affiliate and are used as indicators to evaluate affiliates' environmental performance. The function of the evaluation is to encourage managers to improve environmental performance, rather than to act as a policeman. The evaluation system and the environmental network is not made to force employees to attain objectives, but rather to encourage employees to improve their performance.

3.3.3 Environmental enforcement

The formulation of environmental principles and environmental standards are only one of the important steps to manage the environment across borders; it is necessary

to develop some tools to put the policy or commitment into effect. The TNCs studied developed reporting procedures,



environmental audits and environmental training measures to enforce the objectives. Among the TNCs studied environmental enforcement on environment vary significantly. Some of the benchmarked firms have institutional procedures, such as auditing and reporting to enforce the environmental objectives and standards while others have no such procedures.

In addition to the environmental impact assessments required by the Chinese government, some companies conduct their own environmental assessments prior to acquisition. The purposes are to ensure the potential negative effects being recognized, assessed and minimized in accordance with corporate policy. In such assessments it is essential that the results of the assessments are documented, including the action items, completion dates, and responsible departments. More than 50% of the affiliates reported that environmental assessments had been made prior to acquisition.

Around 40% of the sample firms have formal reporting and audit procedures in place. Typically, HQ will audit affiliate environmental performance yearly and/or require environmental reports quarterly. According to the case of Company C, HQ audited their production sites occasionally. Among the 9 Company C affiliates in China, only the Shanghai plant was audited in 1998.

Environmental auditing at Company F

Audits are an important part of Company F's environmental management system. The HQ conducts regular environmental audits. The audit encompassed the following contents: occupational safety and health; process safety; environmental protection; waste management and remediation.

Individual plants are audited in order to ascertain whether the

The EH&S audit covers safety analysis and risk assessment, employees' personal protection equipment, fire prevention, stock keeping, and emergency plans. The audit focused on the safety of production lines, storage facility, and protection of employee and neighbors' health. The compliance with other standards will be audited more intensively in the follow-up audits. After the audits, the auditing team discusses the results and puts forward proposals and plans of action for necessary and desirable improvements. In some TNCs, specific guidelines for the audit of the management system have been developed. The deficiency observed in the auditing process are formally recorded and exposed in the audit report.

Table 2 : Cross border environmental management at 7 TNC affiliates

	Envir. Policy	Auditing	Reporting	Objectives & goals
Company A	No	No	No	No
Company B	Yes	Yes, yearly	Yes, yearly	Yes
Company C	Yes	Yes	Yes, yearly	Yes, accident, waste water
Company D	No	Yes, combined with quality audit	Yes, yearly	No
Company E	Yes	No, but quality audit	Yes, twice a year	Yes, conservation target
Company F	Yes	Yes, irregular	No	Yes
Company G	Yes	No*	No	no

* But according to Company G's EH&S report, the environmental audit was carried out in its plant in China.

As can be seen in table 2, two of 7 case firms do not conduct environmental auditing, no environmental reporting procedures exist, and the HQ doesn't set up any environmental targets for the subsidiary. Thus, their environmental practices completely depend on the subsidiaries' environmental awareness and the local regulation. In the other 5 case firms, there are environmental auditing activities in place, but in two of them the auditing is not particularly for environment. 4 of these five firms have formal environmental reporting procedures, typically once a year. According to our interviews, EHS officers at affiliates in China report directly to HQ rather than to regional HQ. In one case firm, the EH&S officers are also required to report on production efficiency, water and power used, COD & BOD, training programs, and environmental problems monthly. In another case firm, corporate and site management also conducts management reviews at regular intervals in order to monitor the effectiveness of management systems governing safety and environmental protection.

Among the benchmark firms, approx. 1/4 reported that they follow particular corporate standards besides local standards. This means that environmental audit for a majority of firms refer to local regulatory requirements rather than corporate standards. That also implies that most of the sample firms observe Chinese standards only in their operation. In such cases, the environmental auditing only ensures that local units are complying with local regulatory requirements.

3.3.4 Information exchange, training programs and incentive programs

Information exchange and training programs sometimes are useful measures for motivating continuous environmental improvements. Our study indicated that, on the basis of reporting procedure, some TNCs developed environmental communication procedures aimed at making environmental information available to the corporation and public.

Environmental performance and the progress in accomplishing environmental goals by their affiliates depend to a large extent on employees' participation. Therefore it is important to have some ways of making managers and employees understand corporate policy and objectives. An environmental manager at Company B told us that it is employees' environmental awareness that contributes to foreign affiliates' better environmental performance. Approx. 60% of the TNCs studied have environmental

training programs, which aimed at improving cooperation and strengthening safety and environmental awareness. Environmental protection is a new and long-lasting challenge to employees, especially to employees in developing countries. Consequently, some case firms (Company E and F) reported that EH&S officers in China are required to take part in environmental training and education abroad. After their return to China, they are not only expected to act as environmental managers and supervisors, but also as trainers to spread their acquired knowledge.

3.4 Environmental relations with NGOs, suppliers and communities

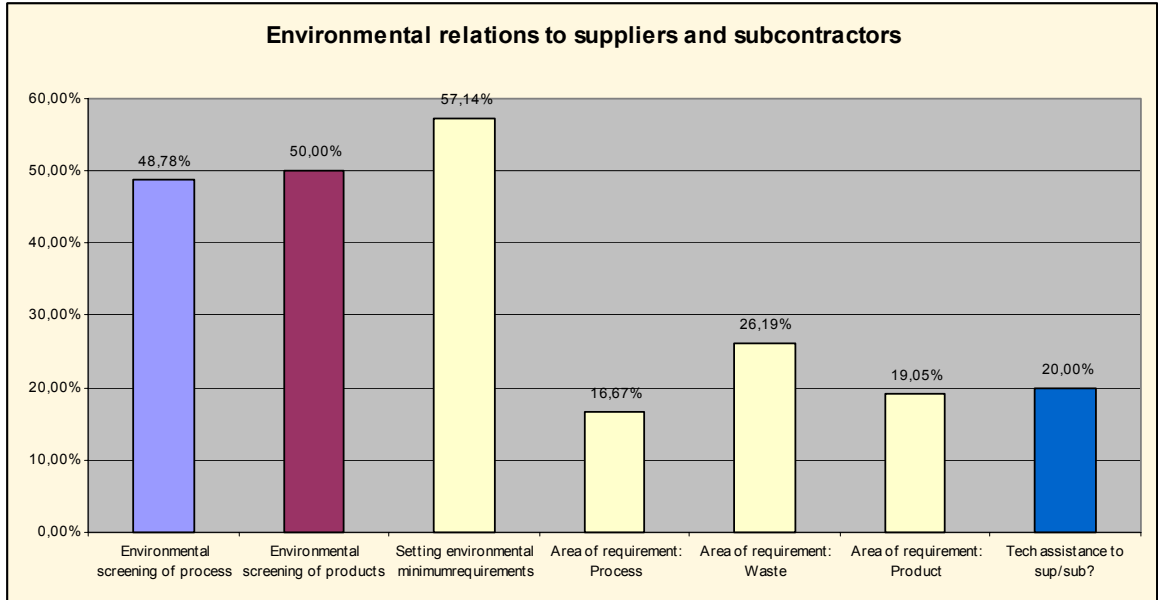
Although many TNCs state that they promote an extensive dialogue with external stakeholders, not much evidence is found in this research. There are some examples showing that TNCs made some contributions but more long-lasting relations with external stakeholders are not documented on an extensive scale.

3.4.1 Environmental relations with NGOs

While Chinese newspapers and TV stations increasingly are disclosing environmental pollution incidents in order to inspire the administration and the public to pay more attention on the issues, the influence of NGOs and communities is not as strong as in OECD countries. For the majority sample firms, they rarely have any relation with NGOs, let alone supporting their activities. Thus, only 24% reported that they providing support for or cooperate with local NGOs. Only very little information substantiated the nature of this relationship. Some affiliates mentioned that they made donations for victims of the Chinese flood in 1998, that they planted trees around the plant, that they made financial contributions to the local community or that they took part in seminars about environmental protection. Among the firms reporting that they did not offer support for NGOs, two stated that there were no NGOs around them.

3.4.2 Environmental cooperation with local suppliers and subcontractors

When it comes to suppliers, long-lasting relationship appears to have been established through various forms of supply chain quality management. We even document that this gradually is extended into environmental management issues.



Concerning external conditions, around 50% report that they conduct screening of suppliers products or processes. 57% further report that they set minimum requirements for their suppliers and contractors. 1/5th of the affiliates in place reported that they are providing environmental technical assistance to the suppliers/subcontractors.

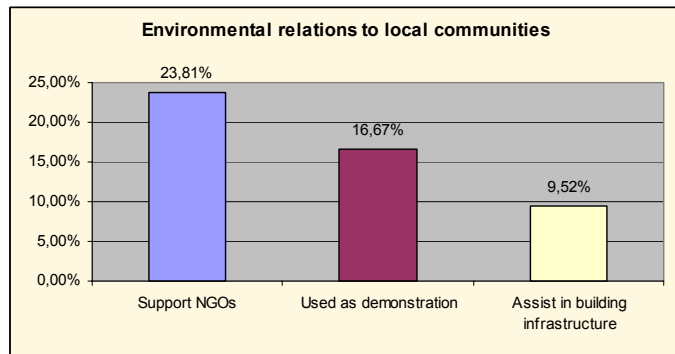
According to specified guidelines by HQ in some of the case firms, the externally oriented activities must be monitored to ensure that environmental requirements are met. However, only in very few cases did we document that the affiliates actually did monitor suppliers' environmental performance, typically only quality considerations were included in such monitoring. When we asked for the reason why suppliers' environmental performance is not monitored, a manager in Company G said that: 'we need not do that, that is the responsibility of the local government'.

Three case firms (Company F, Company B and Company D) review their suppliers both in quality and in environment. In the Tianjin based Company D, the suppliers are classified into three categories according to their significance in the total purchase. About 80% of raw materials are purchased from foreign suppliers designated by HQ and for those environmental and quality screenings are conducted by HQ. The rest of raw materials are from local suppliers, and the affiliate in China conducts quality and environmental reviews before selection. The other two case firms also conduct environmental screening of suppliers' processes, products and waste management. If

an affiliate is not satisfied with revealed environmental standards at a supplier, it may according to management be rejected. One of these three case firms also provides technical assistance in handling the pollution. In Company F, the waste residue is treated by external firms; the service provider is selected according to Local Environmental Protection Bureau's advice.

3.4.3 Relation with local environmental regulators

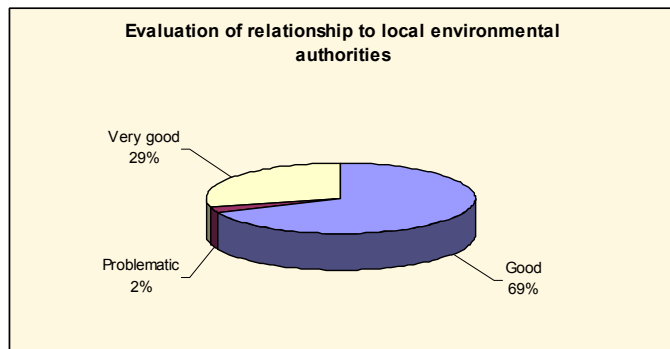
Among the benchmarked TNCs, 10% reported that they were assisting in building local environmental infrastructures and 17% that their affiliate had been used as an environmental demonstration project by local authorities.



The vast majority of respondents reported that the relationship to local authorities was 'good' or 'very good'. The cooperation with the local authorities were mainly in regard to setting standards of waste disposal for the affiliates, environmental impact reviews, etc. Only one of the TNCs benchmarked reported that it had a 'problematic' relationship to environmental authorities. However, this affiliate did not specify the nature of the problems with local regulators.

3.5 A general evaluation of the state of cross border environmental controls

It is difficult to generalize the foreign affiliates'

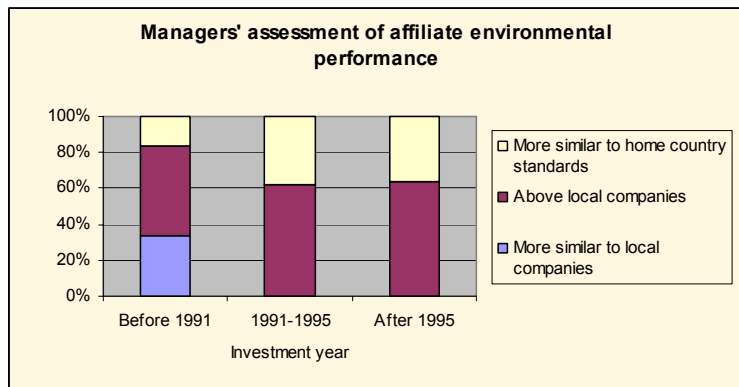


environmental performance compared to that of local Chinese enterprises. Nevertheless, it is our impression that European investors are more conscious about environment protection than are the local firms and firms from developing countries. When we talk with officials from the environmental protection authorities in Tianjin, they report that European firms are better aware of the importance of environmental protection than are the firms from other developing countries. This impression conforms to the affiliates' self-evaluation. According to our sample research, only two

of the 42 sample firms stated that their environmental performance were equivalent to other comparable Chinese firms, both firms established before 1991. All others claimed to be better than the average industry standards in China. In fact, 31% reported their affiliate performance to be more similar to parent country/OECD standards.

We have no solid evidence confirming that TNCs actually are performing above industrial average in China. But the general impression from the case studies is that the machinery is more advanced, better maintained and plants are better organized in the affiliates owned by European investors than it is among Chinese counterparts.

One important reason why European companies appear to perform better than local companies could be related to HQ



environmental policies and programs. The corporate statements and the measures to control the affiliates' environmental performance indicate quite clearly that additional pressures are created from transnational environmental management control. In the following section we will examine this question in more detail.

Apart from the influence of HQ, technology gaps are also important to explain the differences in performance. Because of the connection to the TNCs network, foreign affiliates can access product and process technology that is not easily available through arms-length transactions. Year of establishment may be other factor. Most of European affiliates are setup after 1990, and the regulation for environment is stricter for the new enterprises than the old ones.

Despite the fact that some affiliates report that they strive for uniform standards, very few of the Chinese cases did explicitly refer to home country standards. The point of reference appears mainly to be the local institutional context. Therefore, these affiliates' environment management and environmental performance are most probably above the local average, but below the permitted levels at operations in home country or other OECD countries where the TNC has similar manufacturing processes.

4. Determinants of TNC environmental conduct in China: between localizing and integrating incentives and pressures

It is impossible to explain TNC environmental conduct with any single factor. TNC units in China are constantly adjusting their environmental practices according to local and international incentives and pressures; they also respond to industry factors as well as corporate factors. In this part we will explore the determinants of the affiliates' environmental conduct to see how the TNC affiliates in China balance localizing and integrating factors affecting environmental management.

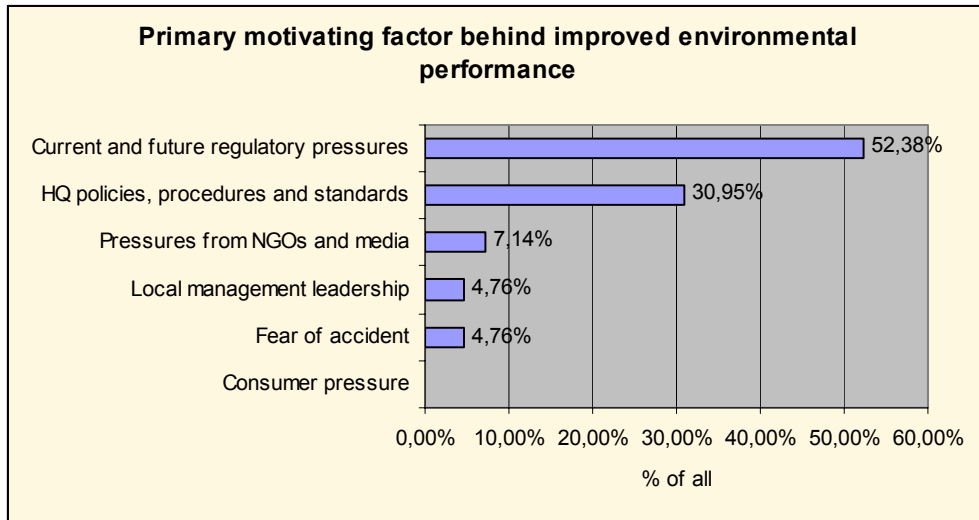
4.1 Pressures and incentives of the Chinese context

As we have demonstrated in the previous parts, most of the TNCs setup their affiliates in China in order to penetrate China's market. Most foreign affiliates in China can thus primarily be expected to comply with China's environmental pressures and incentives.

4.1.1 Environmental regulations

China has developed its own environmental legislation system since the early 1970s. But comparing with the OECD countries, China's environmental standards are lenient and pollution abatement cost is smaller. In addition, there are still problems in regard to enforcing the environmental law and regulatory rules due to lack of resources and infrastructures and insufficient awareness of environmental protection in certain regions. This leaves chances for some companies to avoid environmental controls thus reducing environmental cost. TNCs may even be better positioned to exploit weak regulation than are Chinese firms because of their greater bargaining power. To introduce more FDI, some local government officials sometimes provide various preferences, in certain cases at the expense of the environment (Xian et al, 1999, pp19-20).

Various researchers find that environmental management systems typically are driven by regulatory pressures (UNCTAD, 1993). In the case of China, local regulatory requirements set the minimum standard. All foreign investors should abide by China laws, including environmental legislation. It is obvious that the local regulatory factor is not limited to the current regulatory forces and incentives; it also includes the future prospects of regulation. In the past few years, China has strengthened the



enforcement of environmental legislation. In regard to wastewater, many small polluting plants (especially in the regions along the Huaihe and Fenhe rivers) have been closed down due to their high pollution. Although these actions were not particularly oriented towards foreign owned firms, they point toward a future more stringent environmental regulation. Other signs of the future strengthened enforcement of environmental legislation are the recent changes in FDI policy; projects resulting in environmental damage are rejected while environmental friendly projects are encouraged (Xian et al, 1999).

Some companies said, current or future more stringent regulatory pressure was the main motivating factor for strengthened environmental management in China, and seek to avoid the related higher costs of retrofitting by implementing state of the art technologies in the beginning.

Obviously, the above mentioned problems with enforcement of environmental rules and regulation, do not mean that local environmental regulation is insignificant in China. In fact, this factor is the most frequently cited factor motivating the affiliates' environmental practices. Thus, 33% cited current environmental regulation as the primary motivating factor behind environmental improvements and 19% cited anticipated future regulation. In one sample firm, the company was forced to upgrade

its environmental performance to follow European standards. The story is that an European standard in the near future will be adopted in some Chinese cities to measure the automobile tail disposal. To maintain market access, the company plan to adjust its production process and inputs to conform to those new standards.

In particular, environmental impact assessments required by local government appear among our case firms to have a strong influence. This measure has forced investors to improve their plant design and incorporate pollution prevention measures already in the project design phase.

4.1.2 Traditional industrial policies

Traditional industrial policies is another factor influencing affiliates' environmental management. Some managers mentioned that industrial policies, such as requirements to increase local content, have forced them to use locally sourced materials or technologies that may inhibit the efforts to follow corporate environmental standards. However it is also evident that the effects of industrial policies are becoming quite weak, especially after 1990. Restrictions on machinery, materials and intermediate inputs imported by foreign affiliates in China have been abolished gradually so that they today do not provide any significant influence on foreign affiliates' operation.

4.2 Pressures and incentives of the market

4.2.1 Local market pressures

Green markets are rather embryonic in China. Most consumers in China are reluctant to pay the price premium for green products. In line with this, no affiliate cited consumer pressure as among the primary motivating factors behind environmental improvements.

Customers' purchasing habit sometimes influence firms' environmental protection efforts. Managers in Company C complained that, they try to reduce package material through replacing small bags of detergent with larger. But the product did not succeed in attracting the local consumers.

Sometimes the environmentally sounder products are more competitive. For example, one European affiliate, a pesticide producer, told us that it is the product's nature of being more effective and less toxic that place them in an advantageous position in the

local market.

When green products can not sell at premium prices, the firm will not make the investment to develop the green products. They will follow the local market rule to win the market share even though they have the technology for environmentally sound products. Realizing the local market situation, TNCs will tend to accept the local business rules and environmental standards. This is especially the case for firms whose targeted market is local. Such firms confront the stiff competition from local firms. But how about affiliates producing for exports:

4.2.2 Global market pressures

For the export-oriented foreign affiliates, or the firm with intensive intra-firm trade, the picture could be different. TNCs have stronger incentives to integrate its environmental standards, since a green profile may be rewarded by green markets in the OECD countries, and since a good environmental profile in certain areas is prerequisite to access the market. Therefore it may be economical to follow international environmental standards and maintain tight control of the affiliates' environmental performance.

Previous research illustrated that to access the European market, where environmental consciousness is relatively strong, the enterprises have to comply with European standards regardless of local requirements. A few respondents reported that they had adopted higher environmental standards to meet the environmental requirements in the export market. But when we compare the local market and export-oriented affiliates in this benchmark survey and case studies, we do not find evidence indicating that global market pressures is a major factor in influencing the affiliates' environmental management practices in China.

4.3 Industry specific factors

Different industries face different environmental challenges and are thus to various degrees inclined to establish environmental management systems. The chemical industry has the most advanced environmental practices. This because previous disasters in this industry imposed significant impacts on the whole industry. In our case studies, some firms follow principles of responsible Care programs. Although the policy is one thing and the implementation is certainly another, this kind of program may increase the awareness about environmental issues at a plant. In the case firms

visited, some managers (Company F and C1) refer to the Responsible Care program, and in their environmental profile we also see the influence from this program. This program seems to contribute to the explanation why some affiliates are following standards beyond local requirements and why headquarters have established more formal environmental control systems.

4.4 Pressures and incentives of the corporate network

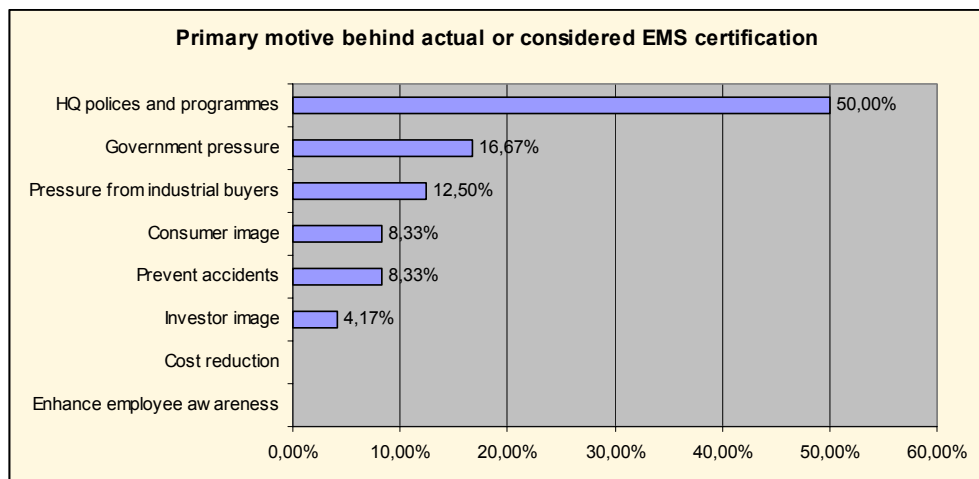
Responding to our question on what is the major motivating factor encouraging them to improve environmental performance, as many as 30% responded policies of corporate headquarters as the most important factor. This means that HQ policies are triggering local procedures, but these procedures are not necessarily following standards developed by corporate headquarters. This is particularly the case at the older plants designed and constructed prior to 1991.

Making the risks calculable

A company must identify, assess and minimize the risks associated with its activities. If an operational incident should endanger the neighbourhood or harm the environment, for example, the associated high and unanticipated costs are only part of the consequences. The company's reputation might be damaged, generally resulting in a drop in the price of its stock. In the case of Company C, which is dependent on the sale of branded

4.4.1 Pressures and incentives of environmental function at HQ

TNCs cross border environmental management system thus is a major driver for affiliates' environmental practices. To comply with environmental requirement in the OECD countries and the initiatives of the various international organizations, TNCs establish their own environmental policies and measures to carry out the commitments.



This is for instance done by outlining environmental principles, specifying objectives, requiring affiliates to report on the environmental situation, or by conducting environmental audits. Such measures encourage affiliates to improve their environmental performance.

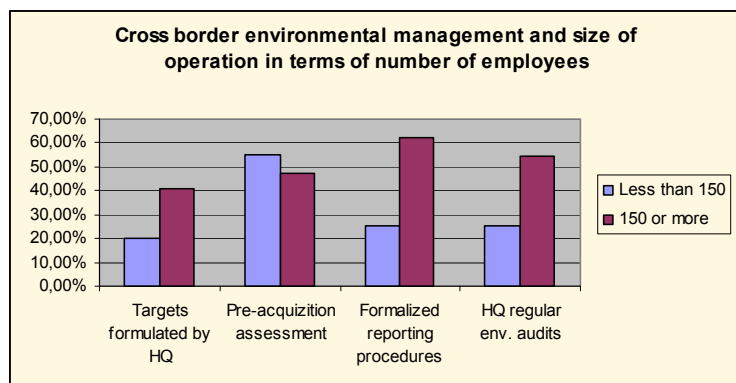
For some firms, HQ asks their affiliates in China to follow European standards and encourages them to get the external certificate, such as ISO 14001. This can partially explain why many affiliates consider certification. Of course, we should not exaggerate the influence of the HQ incentives and pressures. For instance, the cross border environmental management systems are typically rather flexible and holding a 'continuous improvement' nature. The corporate standards often include a reference to statements like "if appropriate". For local market oriented affiliates, local standards become the most important point of reference and they are typically allowed to adapt their processing standards in accordance with local conditions. Therefore the outcome can easily become a significant deviation from corporate standards.

HQ's environmental technological level and its financial position are also important factors influencing environmental performance in China. TNCs from Europe have more technological capacity to adopt environmental effective production processes and products than have local firms or firms from developing countries. When the firms are losing money or are in financial difficulties, they can not afford to invest in environment, as were the case with Company D.

4.4.2 Pressures and incentives not specifically related to the environment

Almost all those TNCs with formalized environmental management systems, had already made equivalent efforts in terms of quality management. This could be rather formalized as inspired by ISO 9000. The quality control procedure did in certain cases trickle down into environmental awareness. Unfortunately, there are still several examples of companies with a relatively high level of quality consciousness, which did not show any equivalent responsibility when it comes to environmental issues. Obviously, if the customers do not express concerns about environmental aspects of products or production processes, affiliates will pay less attention to the environment than the products' quality.

There is a close



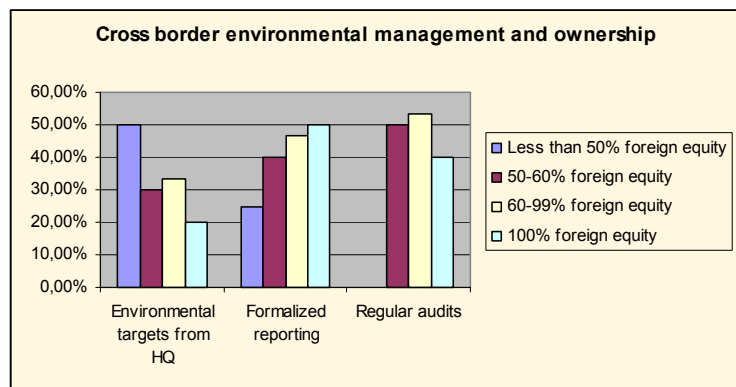
correlation between the nature of cross border environmental management practices and the size of the company in question. For the large TNCs it is easier to develop cross border environmental management systems than it is for the smaller ones. According to Hansen (1998) a company with presence in many different locations can obtain scale advantages by devising a uniform management system and adopting standards worldwide that meet the highest requirements internationally. Small TNCs typically have fewer subsidiaries in other countries. Consequently, their environmental management systems tend to be 'decentralized'. Moreover, for the small establishment, it is not economical to build its own environmental facility to address pollution problems. In one case firm, its wastewater and waste treatment are contracted out due to the smaller size of the plant and due to cost reduction goals.

The TNCs' environmental strategies are also affected by their international management strategy. Some corporations prefer to have their subsidiaries in different countries perform like domestic firms. Other corporations make great efforts to establish a global strategy and ask their subsidiaries to integrate with each other. It is easily understandable that the latter may have a closely integrated environmental management system across border. But the subsidiaries of TNCs of the former type tend to function independently and adopt similar environmental practices as their local counterparts.

4.4.3 Ownership control and environmental management

Another factor influencing environmental management practices is the degree of ownership control.

In the responding firms most are majority controlled foreign entities but among those with minority control there appears to be a significantly



weaker propensity to integrate environmental procedures. The minority owned affiliates usually do not have any environmental auditing and reporting procedures, and cross border environmental management procedures are very weak. Maybe there is a slight tendency that minority owned affiliates are more inclined to report that the

foreign owner sets environmental standards and targets than are in majority owned affiliates. If this is the case, it could reflect that setting standards and targets is the only way that a foreign owner in a minority arrangement can exert influence on affiliate performance.

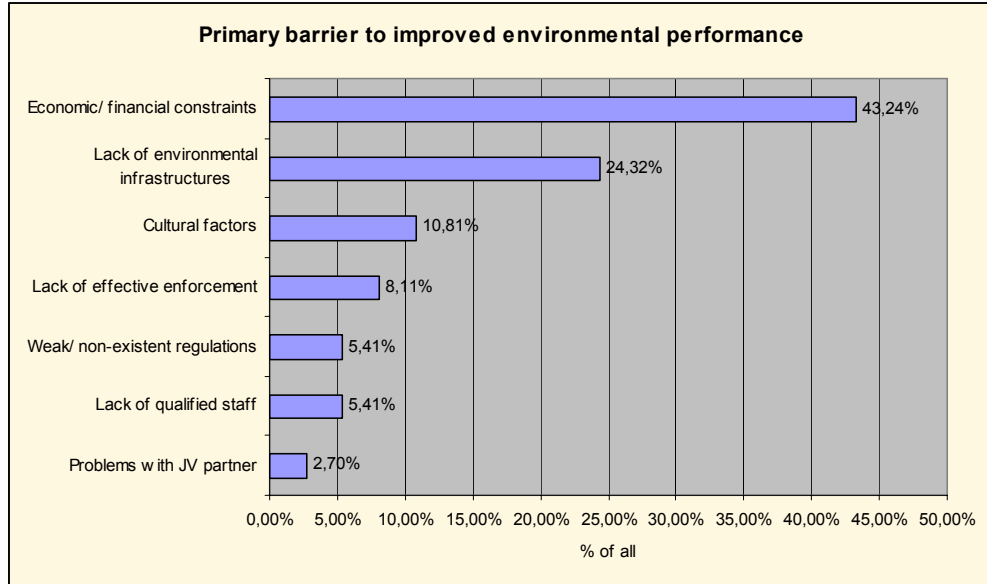
One of the problems related to joint ventures is that the foreign owner, even when holding a majority of ownership, cannot determine the environmental investments and priorities. Frequently, minority partners may not be willing to increase share capital to accommodate environmental investments. We found that in some joint venture firms, the local minority owner did not want to pay for improved environmental equipment and inputs to obtain better environmental performance. Often the local partners have less interest in pursuing the environmental targets beyond local standards.

We also see some affiliates increase the degree of control in the process of cooperation with local partners. After obtaining majority control they increase the environmental investments, reduce consumption of water and energy, and reduce wastewater.

However, affiliates' environmental performance depends on many factors, the degree of control is only one of among them, and probably not among the most important. In one case firm, the foreign investor increased its equity share up to 100%, but environmental problems (mainly wastewater disposal problems) caused by the production process is still there, if not worse. When asked about their environmental facility and the environmental practices, the manager said 'due to tough competition in the local market, the company is in very difficult period, therefore the production is not in full operation and sometimes the environmental facility is closed temporarily. We know wastewater is not complying with local regulation and we also pay a fine every year. We want to improve our environmental performance, but we don't have the money for the investment.' It is obvious that if an affiliate is in good financial condition, making money in its Chinese business, it is easier to increase its environmental investments and improve its environmental performance. But for the affiliates losing money in China and possibly thinking of withdrawing from China, it is impossible to improve environmental performance or conduct sound environmental management practices even though HQ environmental policies, standards and procedures requires this.

4.4.4 Barriers to improved environmental performance

In regard to barriers inhibiting improvements of environmental performance, financial consideration and lack of environmental infrastructure seem to be major factors. 43% of the firms answering this question considered economic constraints as the most important barrier. 25% reported lack of environmental infrastructures to be



the primary barrier. Cultural factors in the staff, lack of enforcement of environmental rules, weak or nonexistent of environmental regulations and lack of qualified staff are also mentioned by the respondents as primary barriers to improved environmental performance. Only one pharmaceutical firm thought the relation to joint venture partner as the most important barrier to achieving environmental performance improvements.

5. Conclusions and perspectives

5.1 Major findings

Foreign affiliates from Europe operating in China apparently show better environmental performance than other firms. They adopt measures to control pollution and implement formal environmental management systems. However, significant deviations from this overall impression were detected.

5.1.1 Double standards and cross border environmental management strategies of European TNCs

As previously discussed, most of the foreign affiliates in China are local market

oriented. In the process of making an investment decision, export conditions, labor cost and pollution abatement cost may be among the factors influencing the choice. However, gaps in environmental regulation between China and OECD countries do not appear to affect the investment decision. This is because pollution abatement cost represents a small share in total cost, and because lower environmental cost is to a large extent not long lasting.

In some TNCs a uniform standard, (corporate standard, international standard or home country standard) is applied in all its subsidiaries regardless of the location and the local environmental regulation. Thus, a centralized environmental management strategy or global integrated strategy is adopted. Most of the surveyed TNCs however, adopted a different strategy. Foreign affiliates in China appeared to focus more on local standards, and environmental controls for the affiliates in China are less stringent than similar firms in OECD countries[□].

5.1.2 Major forces affecting the affiliates' environmental management practice in China

Our research found that there are two factors, which have significant influence on the subsidiaries' environmental practices. First, HQ influences performance by formulating worldwide environmental policies and asking their subsidiaries to subscribe to certain environmental standards. HQ also sets specific objectives for the affiliates in China, requires formal reporting procedures and conducts environmental audits at regular intervals. The enforcement of HQ's environmental policies depends on many elements, such as ownership, features of the products, and local environmental infrastructure. The corporate networks not only impose pressures or incentives to control the affiliates' environmental practices, but also convey clear signals that it is important for the affiliates to take seriously the commitment to the environment.

Secondly, local environmental regulations, current and anticipated, is another major motivating force. As enforcement of the environmental regulation in China is strengthened, it is expected that improved environmental management practices will

[□] For example, fewer Company C affiliates in China than in other OECD countries were audited by the HQ. Moreover, environmental management of Company A's affiliates in Kunshan is less elaborate than the similar firm in its home country.

follow.

Although the sample results indicate that the environmental control with suppliers and subcontractors takes place, the relationship to suppliers and subcontractors is mainly focusing on quality dimensions rather than environmental dimensions.

TNCs' environmental policy statements should be understood as the long-term goal that they will move toward gradually and continuously. As for the affiliates in China, they often interpret those policies differently from affiliates located in OECD countries. Thus, the same environmental policy is subject to different interpretations depending on location. Thus, environmental management appears to be plant specific. Environmental practices do not only differ among different TNCs or different affiliates of the same TNC in different countries, but also among the same TNC's affiliates in China. Large European TNCs usually have several subsidiaries in China. In the fields of environmental reporting, auditing, and environmental target setting, the interpretation and implementation never followed the same model. The variety may come from variations in product portfolio, linkages to internal markets, ownership configurations of the affiliates, or scale of the affiliates. The quality of enforcement and infrastructure in various locations may also be a factor explaining why similar affiliates may have different environmental performances.

5.2 Policy implications

In this research, we found that the TNCs' cross border environmental management systems imposed significant impacts on affiliates' environmental practices. Nevertheless, according to our study of the affiliates in China, the double standard and decentralized environmental strategies appear more widespread than the single standard and centralized environmental strategies. This implies that a strengthened enforcement of environmental laws and a gradual enhancement of environmental standards is pivotal to ensure improvements in TNCs' environmental practices and environmental performance. In other words, although the efforts for creating cross border environmental management systems may be beneficial, the action of host countries is more effective. China should continuously improve its enforcement of environmental regulations.

NGOs and consumers in China are relatively weak and have only limited influence on enterprises' environmental practices. Besides, green markets are highly infant at this moment. This lack of pressures provides an disincentive to the adoption of more

integrated environmental management approaches by TNCs in China. This situation may change in the long run. In the short term, environmental protection authorities can play some of the roles played by NGOs or the green markets thus encouraging TNCs to adopt more integrated environmental management approaches.

6 . References

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7. Appendix 1. Methodological concerns

The reliability of results in this study depends on the quality of information collected. There are several factors that influence the quality of the data.

First, environmental issues are sensitive for some companies, especially for the ones with serious environmental problems. They are reluctant to respond to the questionnaire received, or accept the requests for interviews. It may reduce the representiveness of the database.

Second, although the suitable person for filling the questionnaire is the EH & S manager, the actual respondents came from various positions.

Third, of the 300 questionnaires sent out, only about 20 were mailed back. The rest were collected through on-site interviews or by the help of contacts in companies. This may introduce a bias in the sample too.

Fourth, informants perceptions are always biased not only in regard to the actual performance of their own organizations, but also with respect to the general situation within the sector/industrial area or among competitors locally and even globally.