

# Local Adaptation of Global Integration - TNCs in Midstream? A Case Study of Environmental Management in Malaysia

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**Local Adaptation or Global  
Integration - TNCs in  
Midstream? A Case Study of  
Environmental Management in  
Malaysia**

*By Rasmus Juhl Pedersen*

*Occasional paper no.13*

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**Cross Border Environmental Management  
in Transnational Corporations**

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## **Background to 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 Intercultural Communication and Management, Copenhagen Business School (DICM/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 occasional paper presents results of a case study of the environmental management of TNC-affiliate companies in Malaysia. Based on a comprehensive survey and interviews with selected companies, the paper addresses the environmental governance structure between parent company/headquarters and the affiliate and the relationship of the affiliate to local Malaysian suppliers/subcontractors and environmental authorities. The main drivers of affiliate environmental performance are identified and analyzed in conjunction with a discussion of the main constraints of environmental improvements in the nexus between localizing and globalizing forces. The author concludes that the main driver of affiliate environmental performance is the position in a group of internationally oriented companies in a TNC group in the form of headquarters policies, standards and procedures rather than the influence from market forces in the shape of pressure from consumers and industrial buyers. The primary constraints on affiliate environmental performance are found to be economic/financial constraints and weak/non-existing local environmental regulations and enforcement. Contrary to what was expected, there is only little evidence that export orientation plays a major role for TNC's environmental practices. However, pressures from especially industrial buyers appear to influence environmental management practice.

***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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# **Local Adaptation or Global Integration - TNCs in Midstream? A Case Study of Environmental Management in Malaysia**

By Rasmus Juhl Pedersen<sup>1</sup>

## **1. Introduction**

### **1.1 Research questions**

This is a study of TNC and environmental management at the level and perspective of TNC affiliate companies in Malaysia. The research on TNCs and environmental management is flawed by an apparent lack of detailed studies of the environmental behavior of TNC affiliated units in developing countries, and this is the case for Malaysia as well. This study therefore aims at filling some of these blanks by drawing on two main sources of data.

A survey aims at identifying the environmental practices of TNC affiliates in Malaysia, to characterize these practices, and to determine the forces which drive or constrain behavior, improvements and changes in environmental management.

Case studies of selected companies are used to explore in depth the causal relationships between the different factors identified in the survey and to generate an understanding of the surrounding contextual factors. The wish is to broaden the understanding of the individual company in its industry and market setting.

The title of the study is 'Local Adaptation or Global integration - TNCs in Midstream?' This title may be seen as a characterization of the special situation of the TNC affiliate as part of a local set of circumstances and at the same time, part of a strongly international and global set of circumstances. The title also reflects the status of past and ongoing research on FDI and environment, in that part of the literature argues that the environmental practices of TNCs are foremost the result of local pressures and government regulation whereas a different strand of literature argues that the

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environmental behavior is more shaped by pressures from the international market, international regulation, consumers and industrial buyers.

With this study, the hope is to come a step further in the identification of the factors in the domestic and international markets that determine TNC environmental practices at the affiliate level and to point to reasons why and why not TNCs undertake investments in an improved environment.

## 1.2 The Choice of Malaysia

Malaysia was chosen for this study because the country hosts a large number of foreign manufacturing companies. Malaysia has a higher ratio of FDI to gross fixed capital formation than any other ASEAN member country except Singapore (OECD, 1998). In fact Malaysia has enjoyed a history of being a key site for labor-intensive locations. The impact of TNC activity on production, employment and exports is sizeable. This makes it interesting to study the environmental impact of TNCs on Malaysia.

TNCs have contributed significantly to the growth of manufacturing industry in Malaysia. During the past twenty years, the country has moved steadily from having an economy based on agriculture and commodities to one based on manufacturing. Today manufacturing makes up about 50 per cent of total output and 80% of total export revenue.

The early industrialization was strongly resource-based - tin mining, palm oil, rubber – and was centering around import substitution. This was followed by a long period of export-oriented growth, based on processing of commodities. Since the mid 80s, the export-oriented industrialization has been further emphasized, and Malaysia has become the host of low technology electrical and electronic industry. The 'new industries' are dominated by foreign companies whereas the foreign content in the traditional industries has decreased and the local ownership and control expanded. The foreign influence however remains strong in the wood, brewery, textile and electronics industries.

The tremendous growth record and the growth of industry have put a large stress on the environment. While it is recognized that foreign firms have contributed significantly to the economic development of Malaysia, it is also acknowledged that foreign firms remain an important cause of resource depletion and pollution.

## 1.3 The research set up and methodology

The project aims at highlighting the environmental behavior and conduct of foreign based TNCs and especially Danish TNCs. However the relatively small number of Danish TNCs involved in manufacturing in Malaysia and the distribution between different industrial sectors is insufficient to provide a comprehensive picture of TNC environmental management in Malaysia. Additionally some Danish TNCs either at corporate or subsidiary management level did not wish to be included in the study.

In order to achieve the target of a population of 50 foreign subsidiaries and affiliates, the sample was constructed to contain 250 companies from three industries: Electrical and electronics, textiles and chemical industry<sup>2</sup>. The sampling was done to include OECD-based and non-OECD based TNCs from a list of foreign based manufacturing concerns from the Malaysian International Chamber of Commerce and Industry (MICCI) as well as from the Malaysian Industrial Development Authority (MIDA). A list of Danish firms was compiled based on information from the Royal Danish Embassy. The list consists of manufacturing companies with Danish equity ownership<sup>3</sup>. The Danish companies were sampled regardless of industrial sector in order for the representation of Danish companies to be as large as possible.

The widening of the scope of the study to include OECD as well as non-OECD based manufacturing activity in Malaysia is considered to hold several advantages. The sample reflects the composition and the relative importance of different OECD and non-OECD based FDI. Additionally, it allows for comparison between the environmental practices of OECD and non-OECD companies. The inclusion of both OECD and non-OECD based FDI has the further advantage that the study gains in value and is more representative of the current state of the environmental implications of foreign direct investment in Malaysia.

### **1.3.1 Data sources**

The study draws on two main sources of information: A survey of 59 companies and as part of the 59 companies interviews with 8 of these, 6 of which are Danish companies. Additionally, information from centrally placed persons with years of intimate knowledge of the state of the environment and private industry in Malaysia are included to exemplify data from the survey and the company interviews and to establish the Malaysian context. These interview persons represent Malaysian state, semi-state, private institutions, including NGOs (see list of interviews).

The interviews with centrally placed resource persons were largely unstructured interviews conducted by the author. The interviews generally lasted from 1 to 2 hours depending on the availability of the interviewee. These interviews were for the most part conducted in May 1998. The interviews with company managers were based on a semi-structured interview guide designed to cover the questions in the questionnaire, but flexible enough to allow for discussion of the questions found to be most relevant to the company. The interviews lasted from 1.5 to 2 hours, took place in December 1998 and were all taped. Moreover, the author was taken on a tour of all the companies

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<sup>2</sup> A return rate of 25-30% was judged by our Malaysian contacts to be a success and representative of similar studies in a Malaysian context.

<sup>3</sup> There are some 82 subsidiaries and associated companies with Danish equity participation. The majority of companies are either import, sales, service and distribution affiliates/companies, regional representative offices. Less than 20 Danish companies are in manufacturing and the range of activities are very diverse and broad based. Some are affiliates of well known Danish TNCs like Carlsberg, Danisco, Niro., Codan A/S. Others are SMEs that tend to be smaller in operation and in number of employees. Some do not have a Danish parent company but involve Danish individuals. (Royal Danish Embassy, April 1998).

interviewed in order to allow own on-site observations of the factory floor, waste disposal and storage facilities and when applicable waste water treatment plants. Furthermore the tour enabled exemplification of the arguments made by company management. The data from the interviews are used as examples in the text or is presented in boxes that give more detailed company cases.

Based on the experience of similar studies of environmental management, the 25 per cent response rate makes it likely that there is an overrepresentation of environmental leaders among the respondents. This implies that the reader should interpret absolute numbers regarding environmental management practices with caution. For some questions, the number of respondents in each category is so low that they warrant little generalization. This is especially the case when comparing practices across industrial sectors and countries of origin. This may in particular be the case with the low response rate among non-OECD based companies. Only 9 of 97 non-OECD companies in the total sample have responded to the questionnaire compared to 50 of the 153 OECD based companies approached in the survey.

A second source of potential bias is the fact that this study relies mainly on the responses from TNC managers. It has not been possible to check the validity of individual company responses with the environmental authorities and other stakeholders. Interviews with external stakeholders, centrally placed individuals and institutions however do provide checks on the validity of some of the conclusions.

### **1.3.2 Questionnaire design**

A questionnaire was used for collecting data from companies, and structured in 5 main parts covering the following main topics<sup>4</sup>:

- GENERAL DESCRIPTION OF FACILITY, containing data on basic company facts and figures including questions on location of corporate headquarters, ownership, nature of facility, investment motivation
- ENVIRONMENT, HEALTH AND SAFETY (EH&S) MANAGEMENT AT COMPANY, containing questions on EH&S organization and policy, use of national and international environmental guidelines, use of certification, use of specific EH&S management activities
- ENVIRONMENT, HEALTH AND SAFETY COOPERATION WITH THE PARENT COMPANY, containing questions on use of environmental assessments, auditing, reporting, standards, targets
- ENVIRONMENTAL RELATIONS TO LOCAL AUTHORITIES, SUPPLIERS AND NGOs, evaluating the relationship and cooperation of the firm with external (institutional) actors

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<sup>4</sup> Please refer to Hansen, 1999 for a print of the questionnaire.

- FACTORS AFFECTING COMPANY'S ENVIRONMENTAL, HEALTH AND SAFETY PERFORMANCE, containing questions on motivational factors for improved environmental performance and questions on major barriers.

The questions put to the MNC affiliates are mainly of the finite type "yes/no". In case the question is not applicable, companies are asked to mark the "no answer/not applicable" (n/a) field. In several of the question categories, the respondents are additionally asked to rank by importance the factors listed in the questionnaire. Companies are further asked to substantiate information and/or provide examples in the comment field. Only about 1/4 of the respondents have made use of the latter.

The explicit agreement between the author and the participating companies is that the questionnaire will be used for statistical purposes only and that all respondents and all information will be treated anonymously in the reporting on the project. The same agreement goes for interviews conducted with company representatives. The questionnaire targets environmental managers and officers in charge of EH&S matters (see appendix for further information on company respondents), but in several cases the respondent filling out the questionnaire is the Managing Director/General Manager, the Factory/Plant Manager, the Production Manager, and the Human Resource/Personnel Manager.

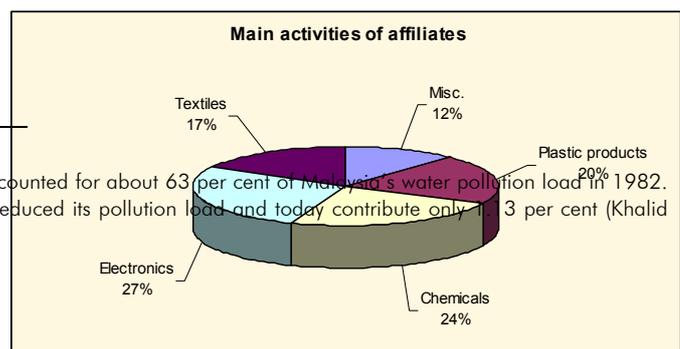
### 1.3.4 The choice of industrial sectors

In a report on the state of the environment and all the sources of environmental degradation in Malaysia, the Government of Malaysia has estimated the following break down of industrial polluters: food processing (40 per cent), rubber and palm oil industries (35 per cent), industrial chemicals and electronics (12 per cent) and textiles 9 per cent. (US-AEP, 1995:).<sup>5</sup>

For the purposes of this study the data input has been targeted from the electrical and electronics, textiles and chemical industry. These 3 industries are not according to the Government of Malaysia the biggest sources of industrial pollution, but with the continued ongrowth of the textile and electrical/electronics sectors they represent growing and relatively new industrial sources of pollution. The environmental problems in these industries concern: water pollution from discharges (organic and heavy metals) to rivers and water basins; emissions to the air and toxic and hazardous wastes. Many of the environmental problems are in connection with the post-consumption phase of the products. E.g. the scrapping and recycling of computers and other electronic equipment.

At the same time these 3 industries represent industrial sectors where the foreign influence is big. This is particularly the case with the

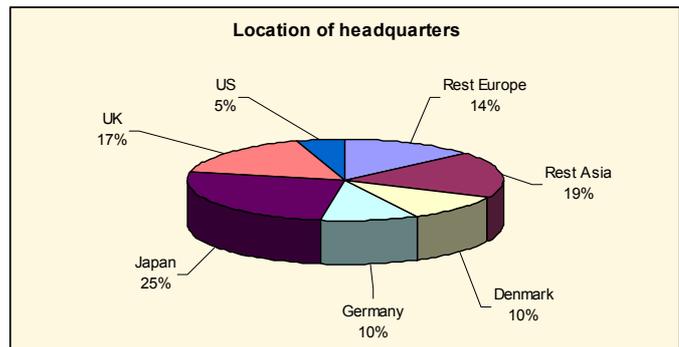
<sup>5</sup> Pollution from palm oil mills alone accounted for about 63 per cent of Malaysia's water pollution load in 1982. However the industry has substantially reduced its pollution load and today contribute only 13 per cent (Khalid Abdul Rahim, 1997)



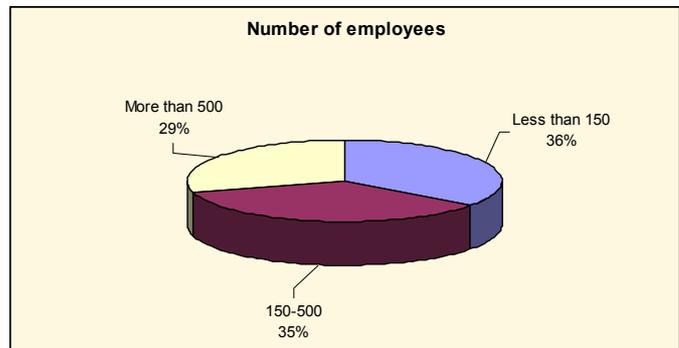
electrical/electronics and the textile industry where the ratio of foreign to total capital is 88 per cent and 61 per cent respectively. Whereas the chemical and chemical products sector has a ratio of foreign to total capital of 34 per cent. In this respect, the chemical industry differs from the other 2 industries with a clear domination by local companies (OECD, 1998:6. See also Rasiah, 1999:9).

### 1.4 Presentation of respondent companies

In terms of country of origin, the majority of respondents are OECD-based FDI. This corresponds well with the fact that OECD countries represent around 60 percent of total FDI in Malaysia (OECD, 1998:8). Taiwan, Singapore and Japan have been the major foreign investors since 1986 in terms of number of projects. In terms of capital, Japan ranks first ahead of Taiwan, the United States and Singapore. The distribution of

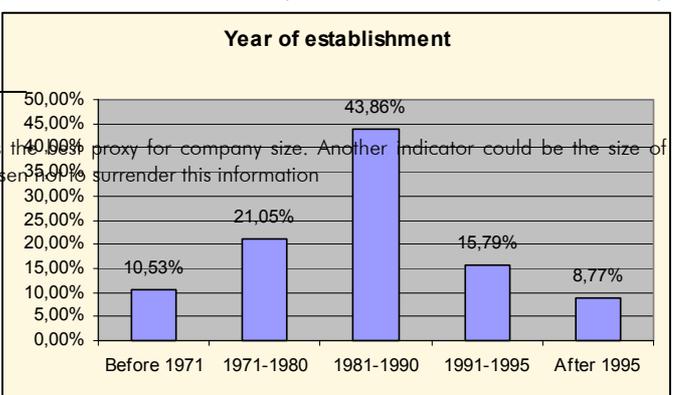


companies to a large extent reflects the relative importance of the major sources of FDI in Malaysia. There is however an underrepresentation of US-firms and non-OECD based firms, that have not wanted to be a part of the study and a purposely overrepresentation of Danish firms. Out of the 59 companies, 14 are Japanese, 10 are from the UK, and 7 and 6 companies respectively are Danish and German. Rest Asia consists of primarily Taiwanese (5 companies) and Singaporean(3) companies, and one Australian company.



The study includes companies of various sizes<sup>6</sup>. About 70 per cent of the companies have less than 500 employees and app. 30 per cent are large companies with more than 500 employees.

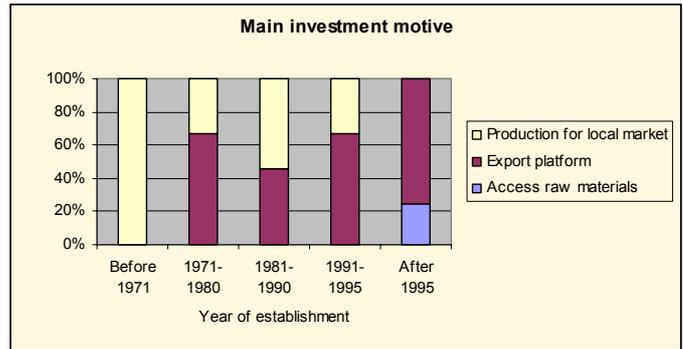
Moreover, it can be seen that the overwhelming majority of the 59 companies in the sample were established prior to 1991. This corresponds well with the historically recorded inflow of FDI in



<sup>6</sup> Number of employees is preferred as the proxy for company size. Another indicator could be the size of turnover, but many companies have chosen to surrender this information

Malaysia. Where favorable investment conditions for TNCs was accompanied by a dramatic increase in inward-going FDI, (OECD 1999, JOMO 1993, Rasiah 1995). The first wave of export oriented FDI into Malaysia began production in Free Trade Zones and Licensed Manufacturing Warehouses from 1972. The concurrent shift in foreign invest flows made electric and electronics and textile and garments the leading manufacturing industries in the 1970s (Rasiah, 1999:5).

The second wave of export oriented FDI followed the mid-1980s recession, when Malaysia became a major recipient of Northeast Asian (Japanese, Taiwanese) and Singaporean investment. This inflow was encouraged by generous incentives provided by government subsidy schemes. After 1995 the inflow has stagnated along with the economic slow-down and recession facing Malaysia, especially with the onset of the financial crisis in 1997.

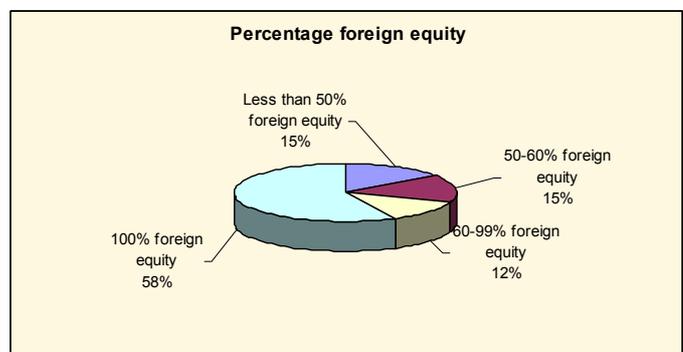


There are two dominating motives for ingoing FDI among the companies in the sample: Production for export and production for the local market. It is interesting to note that a relatively large proportion (54 per cent) of the companies state Malaysia's attractiveness as an export platform as the primary investment motive.

Most of the respondent companies (89 per cent) have engaged in greenfield investments, whereas acquisitions of existing facilities only account for 10.5 per cent. However, in the late 90s, the importance of acquisitions as a preferred entry strategy by TNCs appears to have increased. This is also the case in Malaysia. The rise of acquisitions is not unique to Malaysia. It is a pattern that may be observed in the aggregate data of FDI within the developed countries as well as within FDI between industrialized countries and the developing countries. In Malaysia, the increase in acquisitions may reflect the wish for a more rapid market penetration and the availability in Malaysia of already established companies, local as well as foreign.



There is a large proportion of affiliates with 100 per cent foreign ownership. 53



per cent of the sample has 100 per cent foreign ownership. This is characteristic of the relatively liberal Malaysian investment regime. The policies open up for up to 100 per cent foreign ownership for productions characterized by high export orientation (projects that export 80 per cent or more of their production enjoy the privilege of 100 percent foreign ownership), projects producing high technology or that are priority products for the domestic market (MIDA 1997).

In sum, the sample of 59 companies represent FDI in Malaysia fairly well. For the most part the sample consists of majority foreign owned companies. Most of the companies have a fairly long production history in Malaysia and have been producing there for more than 10 years. Very few of the companies only have a short Malaysian production history. The sample is also fairly representative of the pattern of FDI in that 50 companies are OECD-based investment projects and 31 of these are European and 10 Japanese. Production for exports and production for the local market are equally represented as the dominating investment motives among the 59 companies.

## 2. Cross-Border Environmental practices

Before we engage in identifying and characterizing the environmental management practices of the foreign affiliates as they are perceived and presented by the company management, it is worthwhile to put the newly acquired data produced by this study into a historical context by looking at the past evidence of TNC environmental conduct in Malaysia.

### 2.1 The evolution of Malaysian environmental regulation

The environmental agenda has experienced dramatic shifts in Malaysia from 1970 to the present day. In the 1970s there was very little mentioning of environment. The prime concern of the Malaysian government was to attract labor intensive foreign companies and a prime objective not to discourage the inflow in a situation when Malaysia was competing hard for foreign investment with neighboring countries (SERI, 1998 interview). The structure and agenda of environmental legislation and regulation in Malaysia has undergone significant change since the inception of the EQA in 1974. According to the DOE, there have been 3 stages:

1. stage. Pollution control with a bias towards industrial effluents, waste, so-called end-of pipe problems. Malaysia introduced legislation directly targeting major pollution problems in the oil palm and rubber industries using the "polluters pay principle"<sup>7</sup>.

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<sup>7</sup> In the 1970s and 1980s, government targeted its efforts on the rubber and palm oil industries that were identified as the main industrial sources of pollution. This policy was very effective in reducing the emission/effluent load to rivers and water basins (Vincent, 1993).

2. stage. Pollution prevention and planning. Rather than try to control pollution through costly and less efficient monitoring and enforcement, regulation was aimed at setting environmental standards and limiting the use and depletion of resources through planning of investment and the requirement of manufacturing licenses and Environmental Impact Assessment (EIA).
3. stage. Self-regulation. Is a further realization that government has difficulties enforcing environmental standards. Rather government wants to see industries taking the lead through self-regulation and voluntary action. Maybe as a reflection of this, industry representatives take part in various committee work where environmental standards and certification is discussed.

The Malaysian government as part of its self-regulation strategy has encouraged the privatization of household waste management, hazardous waste management and the monitoring of water and air pollution. Privatization efforts offers opportunities for domestic and foreign companies alike to push cleaner technology and the Government hopes to ensure a higher quality of environmental management by introducing new, advanced technologies and management systems in the most economically efficient manner (DANCED, 1997:11). As the market for cleaner technology expands, so does the market for environmental consultancy. Malaysia has a growing industry that offers services in relation to environmental, screening, auditing, certification etc.

The shifting emphasis of government regulation is a reflection that the sources of pollution within industry are changing from clearly discernible pollution problems in the traditional sectors of production to less clearly researched and understood environmental problems in the new growth sectors: chemicals, food processing, textiles, and especially electronics. The Government as a result is seeking the cooperation of companies in order to identify environmental problems and in order to induce the private sector to adopt voluntary measures. The strategy to encourage voluntary measures should also be viewed in the light of a combination of limited resources available for developing and enforcing quantitative standards and an expanding private sector capacity for developing and adopting cleaner technologies and improved environmental organization and management practices.

The introduction of incentives are supposed to promote the use of more environmental friendly technology. The incentives include rebates on import duties of environmental technologies, tax exemption and special loan- and financing arrangements for environmental investment (Sham Sani, 1998). According to Rasiah 1999:18), it is unclear if incentives play a useful role in stimulating the use of environment-friendly technologies.

## **2.2 Past Evidence of TNC Environmental conduct in Malaysia**

The subject of TNCs and environment in Malaysia is an underresearched topic and only few studies have made TNCs environmental practices the subject of particular study. Several reports and papers refer to the manufacturing industry as a source of

actual and potential EH&S problems in Malaysia, and some point to the role played by TNCs (see Sani 1998; Tan 1998; Vincent and Ali ed., 1997; Rahim 1997; DANCED, 1997; USAEP). But the references to TNCs are sketchy and general in nature and do not provide additional knowledge of foreign firms' environmental management practices.

In a recent paper, Rasiah (1999) considers the past evidence from the more comprehensive and detailed studies made in Malaysia. The two questions addressed in his review of environmental policy and TNCs and environment in Malaysia are; 1) whether environmental considerations play a role in the relocation of TNCs to Malaysia? and 2) what is the environmental performance of TNCs once they are located in Malaysia?

Rasiah finds that relocation of production based on environmental cost and regulative considerations in home and host countries appear secondary. However, there are reported incidences where foreign TNCs have adopted inferior environmental practices in Malaysia. These are cases of dumping and storing of radioactive waste, industrial location and infrastructure projects' impact on pollution of rivers in the 1970s and 1980s, damaging fumes released to the air and poor occupational safety and health practices (see Rasiah, 1999 for more detailed information on three reported and often quoted cases of environmental malpractice in Malaysia).

Evidence from the electronics and textiles industry further supports the hypothesis that TNCs have in the past transferred older and inferior machinery because of lax environmental conditions in Malaysia. With regard to the pulp industry, Sonnenfeld (1997) reports that with the relatively recent introduction of new technology in the pulp industry in Malaysia and South East Asia in the late 1980s and early 1990s, the environmental performance of pulp plants has improved considerably. According to Sonnenfeld the environmental friendly technology was developed in response to European social movements' efforts to tighten environmental regulations and increase demand for "green" products. More restrictive Malaysian technology import licensing requirements together with the increasing availability of modern and environment friendly technology in the market place has encouraged better environmental performance. The same may be said for the rubber and palm oil industries, but here industry has relied on a combination of foreign technology inputs and locally developed solutions (Vincent, 1993). The major improvements recorded are generally attributed to concerted government and industry action after the huge environmental problems had been realized by the DOE (PORIM, 1998; Vincent, 1993).

A recent study by Jenkins (1999), quoted in Rasiah (1999), suggests that foreign and majority foreign-owned firms make greater efforts to utilize environment-friendly technologies and demonstrate better environmental practices than local and majority local-owned firms. In Jenkin's cross-sectional analysis the superior environmental practices of foreign firms is attributed to foreign-owned firms' larger size and resourcefulness, market orientation and use of more recent technologies. However, Jenkins does not find a positive correlation between foreign ownership and environmental standard when controlled for technology, market-orientation and size.

Rasiah concludes that based on past data, firm size and market orientation of TNCs seem to be the most important variables explaining environmental practices in Malaysia. And because TNCs tend to be large and use more recent machinery, they tend to demonstrate better environmental practices.

Interviews with central environment agencies, organizations and resource persons in Malaysia confirm that TNCs are not the major cause of environmental problems in Malaysia. According to CETEC (an important environmental NGO) "TNCs generally enjoy a good reputation". Rather it is the large number of domestic SMEs that are the prime concern, many of which are backyard industries that operate in the so-called informal sector and try to avoid government regulation. Other interview sources confirm this picture of an environmentally backward SME sector (ISIS, PE Research, SERI). It appears that local SMEs are better able to stay out of the scrutiny of the authorities. Further, ISIS finds that environmental practices of SMEs are condoned by the government since the investment in EH&S would throw many small producers out of business. The scrutiny of TNCs by the DOE is thus believed to be more strict than with domestic companies. The reason being that foreign companies are more visible and obvious to both the government and the public, and therefore it is easier to enforce legislation (PE Research).

The concepts and methodologies used in this study complement the work done by Jenkins and Rasiah, because it presents a much more comprehensive and detailed experience of the individual company experience that's builds both on an elaborate survey and of individual company case studies.

## 2.3 Cross-Border Environmental Practices in Malaysia

This section deals with three dimensions: 1. The environment, health and safety management at company; 2. The environment, health and safety cooperation with the parent company; 3. The environmental relations to local authorities, suppliers and NGOs. Dimensions 1-2 deal with the *intra-firm* relationship, in particular the environmental governance structure between parent company and the affiliate company. Here the objective is to analyze the extent and direction of cross-border transfers of environmental technology and management practices. Dimension 3 deal with the *inter-firm* relationship between the affiliate and companies with the objective of exploring the extent and direction of transfers and spill-over effects to local companies and institutions that come into contact with foreign based TNCs.

### 2.3.1 Environment, health and safety (EH&S) management at company

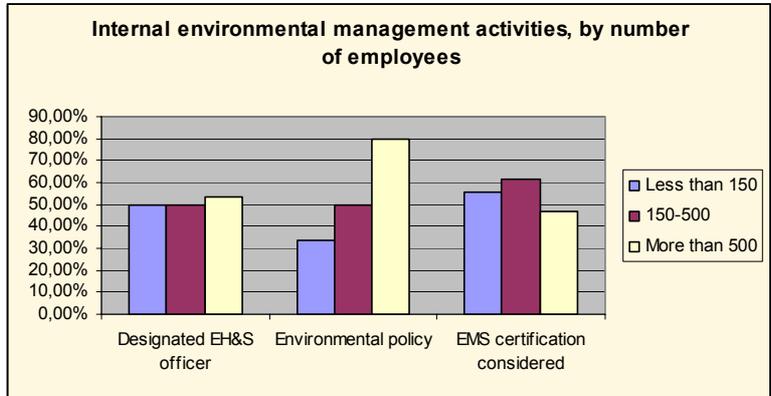
#### **Environmental policy**

Increasingly, TNCs develop policies that relate to their objectives and plans in the environmental field indicating, how they aim to live up to environmental legal requirements at home and abroad and how they aim at meeting the increasingly

complex demands from various stakeholders with a view to incorporating the environment into corporate strategy.

56 per cent of the affiliates has formulated an environmental policy. In 24 out of the 59 companies this environmental policy was formulated by headquarters.

Despite the centralization of overall policy making, the environmental policy is adapted to live up to Malaysian legal



requirements and to the plant and site specific needs. One company thus states that “The organization formulates its own policy but in line with the parent company”. This variance in headquarters influence on the policy formulation reflects a degree of affiliate autonomy.

Even though many companies do not have a specific environmental policy, some companies indicate that the environment is an area that is stated generally in company policy and motto, e.g. by providing a broad declaration of company intentions of good working environment (see text box for examples of environmental policy statements).

The size of the affiliate is a determining factor whether the affiliate has a written and formalized environmental policy or not. The table illustrates that 80 per cent of companies with more than 500 employees do have an environmental

policy, whereas 1/3 of the companies with less than 150 employees do not have an environmental policy.

**Examples of environmental policy formulation at the affiliate level**

... commits to continually seek the improvement on environmental performance in regard to its operations, its products and its packaging. ... has established an Environmental Management System as a means of ensuring that the effects of its activities comply with its environmental policy and associated objectives (Electronics company)

Pursue the goal of no harm to people, protect the environment, use material and energy efficiently to provide our products and services, publicly report on our performance, play a leading role in promoting best practice in our industries, manage HS&E matters as any other critical business activity, promote a culture in which all ... employees share this commitment. (Chemical company)

Promote harmony with society and environment to become a trusted member of the community. Minimize waste and conserve energy and resources in the manufacturing activity. Prevent air, water and noise pollution and minimize the use of hazardous material to ensure sustainable development and friendly environment. (Chemical company)

***EH&S Organization***

All Malaysian companies with more than 40 employees are required by law to have a “safety and health committee” as part of a firm level safety and health policy, and in this the environment and particularly the work environment is included as a general

issue. About 90 percent of the companies in the study have a safety and health committee.

Because of the requirement to have a safety and health committee, 53 per cent of the respondents have a designated EH&S officer. However, caution has to be employed, because the employment category often used in Malaysian companies is "Occupational Safety & Health Officer", and the managerial responsibility for environmental matters frequently rests with a widely different group of personnel. The role and importance assigned to the environment and especially the external environment is difficult to judge based on this. The comments by the companies to the questions whether they have a designated EH&S officer and whether they have a safety committee illustrate the division between managerial and operational responsibility and the variance between companies as to which part of the organization handles the environmental matters. The projects reporting not to have a designated EH&S officer, specified that responsibilities for the environment was with various functions, e.g. the 'industrial engineer', the 'utility manager', the 'general manager', the 'managing director', the 'planning and utility manager', or the 'general affairs officer'.

**Specific EH&S management activities**

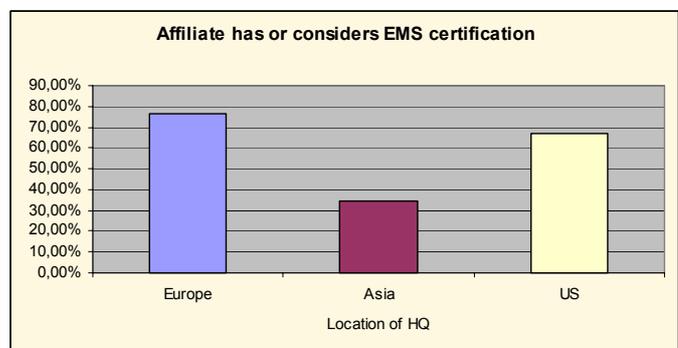
71 per cent of the companies claim that they have specific policies and programs for improving EH&S performance. Unfortunately few companies have substantiated in detail what these policies and programs consist of. One exception however is a chemical company that prepares environmental policy & action plans/objectives annually and monitors progress on a monthly basis.

Asked about specific EH&S training programs for employees, 68 per cent of the companies say that such programs exist. For the most part these activities consist in teaching of workers health and safety procedures and in awareness training and initial training under the certification for ISO 14001. Only 20 per cent of the companies prepare separate environmental accounts.

**Use of environmental certification**

Five companies (9%) have an environmental management certification, and in all cases it was an ISO 14001 certification. 50% per cent are further considering certification according to an environmental management standard.

70 per cent of the companies subscribe to a quality standard. ISO 9001 and ISO 9002 series has gained a large popularity in Malaysia. Exporters and suppliers to MNCs consider it a necessity in order to be assessed as a quality conscious and quality minded producer. According to figures from SIRIM (The standard board of Malaysia) there are 17,000 Malaysian companies that have this quality certification, and it seems that it is within the same group of companies that we shall find companies that either have or plan for an environmental certification. Thus, app. 2/3 of those



companies considering or having certification according to an environmental management standard, were certified according to a quality standard. According to the general manager of a rubber manufacturing company, “quality and environment is very closely linked. Parts produced to high quality has less defects, and less defects are equal to less waste”. SIRIM is the main Malaysian body issuing ISO 9000 and 14001 certification. The ISO 14001 has only been available in Malaysia since 1996, and SIRIM expects it to gain substantial popularity with Malaysian companies, however not to the same extent as is the case with ISO 9001/9002. SIRIM provides courses and seminars for companies that plan to or already implement ISO 14001.

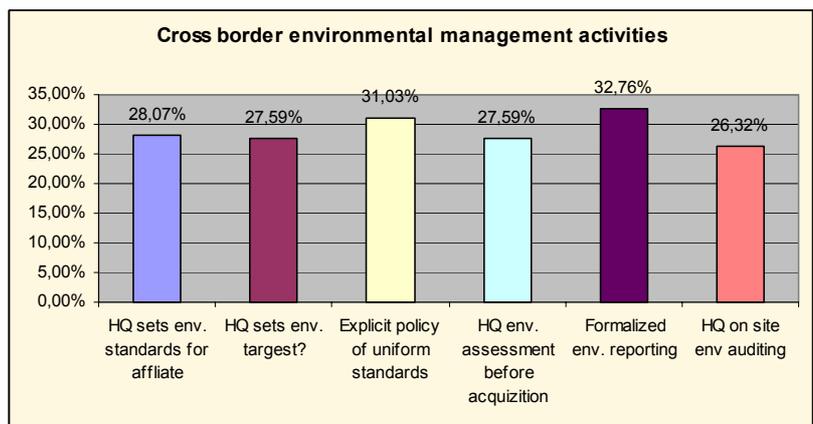
With the growing awareness of the environment in Malaysia, companies’ interest has turned towards EMS and particularly the ISO 14001. The ISO 14001 was introduced relatively late in Malaysia, 1996. 1997-1998 is the 1<sup>st</sup> year of operation. By December 1998, 54 companies had been certified through SIRIM and additional 10 certified through other bodies outside Malaysia (SIRIM, 1998). According to sources at SIRIM, this is a high number of companies in comparison with other developing countries. According to SIRIM, and consistent with the findings of our survey, the ISO 14001 certification is concentrated in the electronics and articles industry and in the palm-oil industry, and the interest is particularly strong among foreign TNCs and large local companies. The major driving force is according to SIRIM the pressure from the market, in particular end consumers and industrial buyers.

It is interesting to see that Malaysia is quite active internationally in the discussion of ISO 14001 unlike some of its neighboring countries, Indonesia, Singapore etc. (ISIS 1998). ISO-14001 is part of the Government’s and industry’s self-regulation agenda. The former Director General of the DOE, Mr. Abu Bakar phrased the present federal state environmental agenda like this: “The 1<sup>st</sup> step for companies is for them to believe in EMS. As a 2<sup>nd</sup> step they have to live up to it. ISO 14001 is still to some degree rhetoric, and there is some times difference between what companies say they do and what they do”. It follows that work takes place in Malaysia to discuss environmental standards. There are activities, especially with the inclusion of SIRIM, aimed at spreading environmental certification to a larger segment of Malaysian industry. This work takes place in the form of workshops/seminars, the dissemination of brochures, etc. There are also a growing number of consultancy companies and institutions that obtain the right to issue certification and to monitor individual company progress.

**2.3.2 Environment, health and safety cooperation with the parent company**

The concept of ‘cross-border environmental management’ captures the international aspects of environmental management (Hansen/Ruud, 1996; Hansen, 1998). It consists of those elements of an environmental management system directed at managing environmental

activities of foreign operations. A



cross border environmental management system entails the standards, procedures and practices, procedures for control and enforcement, and the formal allocation of responsibilities among employees and functions and among parent and subsidiary or affiliate company (See Hansen, 1999b).

The data strongly suggests that the relationship to HQ plays an important role in the adoption of environmental management in the affiliate companies. This section of the paper examines this relationship. What kinds of management tools are used in the relationship between parent and affiliated companies?

### **Standards and targets**

35 per cent of the respondent companies state that their company group follow an explicit policy of adopting same standards regardless of location, that is uniform environmental standards. Hadlock (1994) and Brown et al (1993) have suggested that

companies may adopt uniform standards that are independent of and often go beyond local regulatory standards because this may contribute to furthering economic and organizational efficiency for the TNC group of companies as a whole. Still, TNCs stating to follow uniform standards globally seek to adapt and localize the standards so that they meet the specific requirements of the affiliate and suit the

#### **Using the same environmental criteria globally**

Firm D is a producer of food ingredients and additives and is represented with manufacturing subsidiaries in 7 countries. In Malaysia the prime investment motive is access to raw materials. Firm D has signed the ICC's Business Charter for Sustainable Development in 1992 and uses it as part of the company's environmental policy. D has signed on behalf of its subsidiaries outside its home country. In a memo, headquarters interprets the charter's requirement to "apply the same environmental criteria internationally". Using the same standards globally, it is argued leads to advantages of cost, competitiveness and consumer image, especially with industrial users. It is argued that "the same criteria" means that once overall policies/guidelines have been established they should be observed throughout the group (e.g. the use of safety helmets). Specific policies and guidelines at the affiliate level are based on: attention to specific national conditions (national legislation), particular practices, and particular focus of individual companies. In this way individual business units and companies can draw up their own environmental strategies and plans of action. For each individual company the "principle of local responsibility" applies.

The company employs environmental screening of new sites and facilities. This has been relevant in connection with the acquisition of a neighbouring domestic competitor in Malaysia. An acquisition report including an environmental screening is prepared that makes an account of the present state of affairs and development plans for reaching company D's objectives. D is cautious not to invest in outdated technology that may necessitate future costly improvements and reinvestments. Environmental data based on annual audits, visits and (standard) questionnaires is collected from all production facilities and are spread throughout D's organization all the way up to the Board of Directors. Exchange of ideas take place between technical managers and are used in education programmes. D is conscious that the environment may take on a bigger role in the future when it comes to shareholder value.

prevailing local conditions. The food company presented in the text box is one such example of a company that depending on local legislation, special requirements and conditions at the site leaves room for individual tailoring of a site specific environmental strategy and action plan within the umbrella of overarching world-wide standards.

In many ways the term uniform standard is left open for interpretation. And the most commonly used benchmark standard is for the affiliate as a minimum to comply with the environmental policy of the host country. Other companies state that headquarters provide general guidelines and leave it to the affiliate to localize, i.e. make changes that suit the local conditions. If local legislative requirements are found to be inadequate, some companies state that they are asked to adopt best possible practices.

#### Applying state-of-the-art technology

As part of a recent acquisition of a US-based company in Malaysia by the Danish company M, the acquired company EM manufactures latex (PVC, silicon) catheters and tubes for the local and regional market and is thus complementary to M's own production of high quality catheters. It is a low cost, highly labour intensive operation based on semi-automated processes. The Malaysian affiliate has been through a turbulent history since it was set up in 1976. Before M, the company has had 3 foreign owners (UK, German, US), and the previous US-owner had according to the affiliate company reached the conclusion that it could not continue with the same exhaust technology which was found to produce serious environmental problems. Had it not been sold to M, the company would have been closed down. In this particular case, the parent company M found the local legislative requirements inadequate for regulating the exhaust of ammonia/cyclo hexanol. And Malaysia does not have rules for emission of ethylene oxide. As part of a pre-acquisition environmental assessment, the parent company M made plans for technology upgrading of existing sterilization equipment. It is a 0.5 million USD investment. The equipment will meet the same standard as in the company's 2<sup>nd</sup> Malaysian affiliate, which is based on state-of-the-art technology.

This is a case of a parent company where the environmental policy is not a specific written document and where the group has no environmental certification. The parent company claims that its environmental management practices are guided by its consciousness and by the prevailing environmental regulation and EH&S culture in the home country.

#### Use of double standards

It has been suggested by (Castleman, 1985) that TNCs apply a double set of standards taking advantage of differences in regulatory intensity between countries. Adopting double standards implies that the TNCs develop a higher environmental standard for the home country compared to the inferior standard applied to facilities and activities at the affiliate plants in developing countries.

There is some evidence of double standards by TNCs in Malaysia. SIRIM has concurrent with Rasiah's findings from the 1970s and 1980s, experience of imports of outdated technology; of treatment facilities that are imported and

reconditioned, of installation of treatment facilities that do not take into account future production expansions. Companies interviewed about this agree that not all technology and facilities used in Malaysia and other developing countries are state-of-the-art. The

#### Applying double standards

This example of a printing/chemical company illustrates the use of double standards, meaning that the technologies, standards and practices applied in the Malaysian affiliate are inferior to those applied in the parent production facility. The Malaysian affiliate uses technology and practices that are no longer allowed in the home country. These practices are admittedly potentially harmful to the workers and involve insufficient exhaust and ventilation from machinery, and the use of very strong chemicals (solvents and enamel paints). These practices were widespread in the home country in the 1970s, but were abandoned as the knowledge of the hazardous impacts on humans were gradually disclosed and became known to the management and the employees. However backward the technology may seem in the home country context, it lives up to Malaysian regulations and exceeds the environmental performance of similar local companies in the same industry.

study provides examples of present day use of double standards in relation to the technology and machinery used at Malaysian affiliate. In some of these cases, the adoption of double standards does not owe to a corporate wish to lower environmental standards and performance in developing countries but rather to companies' wish for localization of know-how and technology and the wish to extend the life-cycle of the technology. The technology has to fit the knowledge level of subsidiary workers and the cost of labor. Moreover the inferior environmental performance may owe to problems of implementation related to the poor standard and non-availability of central storage, treatment and recycling infrastructure for waste and hazardous materials.

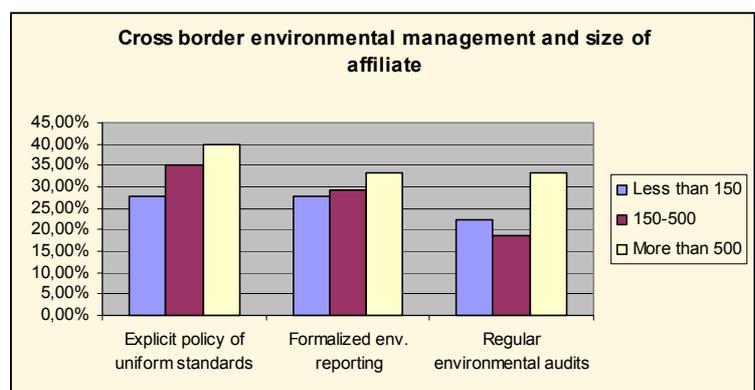
That there may be room for the affiliated companies to maneuver locally is further evidenced in the company feed-back on the question whether headquarters sets specific environmental standards at the affiliate level. 49 per cent of the respondent companies state that they do not receive directives as to what standards to use.

Provided HQ does set environmental standards for the affiliate, it is usually as in the case of a large Japanese electronics manufacturer in the way of prescribing the ISO 14001 as the relevant management tool with which to achieve local objectives. 27 per cent of the affiliates state that HQ does set targets for environmental improvement including cases where HQ requires very specific targets for improvement. One textile company thus has to meet a certain level of efficiency as for energy consumption per 100 m. of fabric and one prescribed way of doing this is to use better machinery. The majority of companies are left to themselves when deciding which targets for environmental improvements to set. Companies that are given targets for improvements say that they have to meet certain targets for solid waste reduction, energy consumption, effluents, air emissions. Some targets specifically relate to occupational safety, that is reduction in the occurrence of industrial accidents, lost time because of injuries and fire.

**Formalized reporting and regular audits**

32 per cent have some kind of formalized reporting back to HQ. The reporting ranges from an informal exchange of ideas to detailed monthly, quarterly and annual reporting. For the majority of companies, EH&S is not a formalized part of reporting back to the parent company. This may be explained by the absence of a specific environmental

management function and responsible EH&S officer. Furthermore, for many companies the environment pose a relatively new agenda and for this reason the EH&S organization is not in place yet.



26% reported that the parent conducted environmental audits at the affiliate with regular intervals.

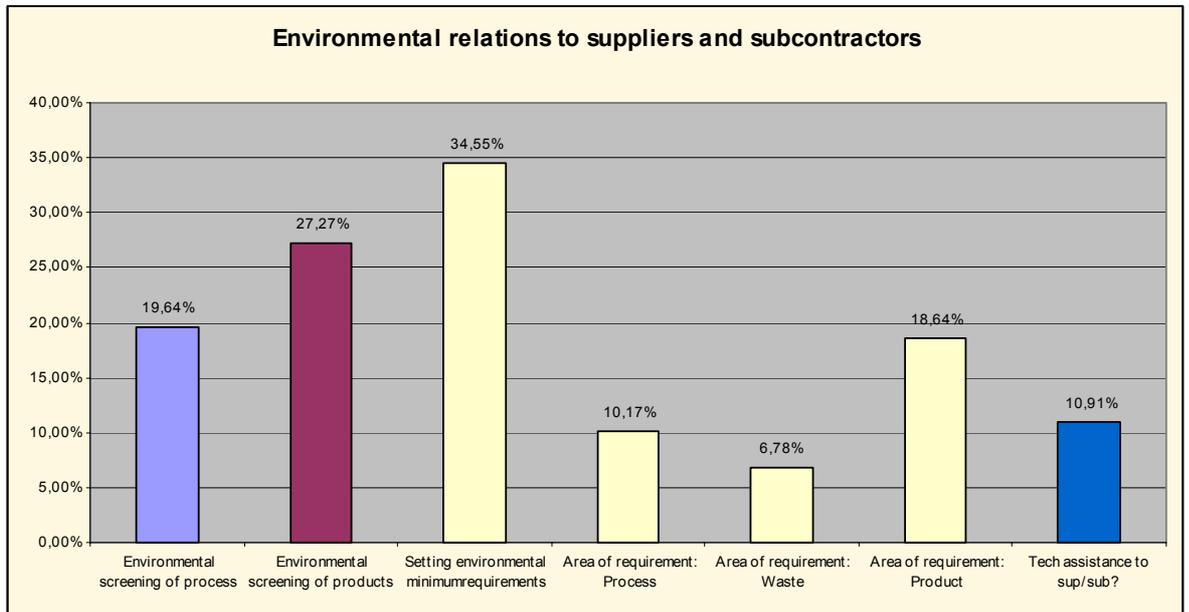
In general, cross border environmental management measures were strongly correlated with the size of the affiliate.

**2.3.3 Environmental relations to suppliers and subcontractors**

This section sets out to evaluate the inter-organizational relationship and cooperation of the TNC subsidiaries with external (institutional) stakeholders in the public as well as the private sector in Malaysia. The objective is first to identify and characterize areas of cooperation that contribute to either an improvement or deterioration of the environmental performance of local companies that are associated with TNC affiliates through transfer or spill over effects. Secondly, the relationship between the TNCs and the Malaysian environmental authorities is explored with a view to determining to what extent TNCs and local authorities collaborate and share efforts to solve environmental problems.

**Practices towards suppliers and subcontractors**

Attention here is directed to the questions of how TNCs organize environmental work within the entire network of production and service facilities, controlled as well as non-



controlled. One dimension is the extent to which TNCs control the environmental performance of suppliers and subcontractors. The figure illustrates that working with suppliers and subcontractors on environmental matters is not a common feature of companies’s environmental strategies. In the following, each of the areas of environmental cooperation and control will be identified and discussed.

**Product and process screening**

From the figure it is clear that the practice of screening subcontractors and suppliers' products is more common (27 per cent) than the practice of screening their processes (20 per cent). And when screening manufacturing processes the motivation is mostly connected to securing the quality of a supplier's products. A company in the rubber manufacturing industry reports that they had an employee spend time with a local supplier overseeing the implementation of incremental improvements at the plant, because poor lighting and dirtiness was adversely affecting its own product quality. The objective however was not an environmental one, even though it may have had a positive impact on the supplier's work environment.

**Technical assistance/requirements vis-a-vis suppliers**

There are only few reported attempts to strengthen linkages with suppliers and customers in the form of imposing minimum requirements and providing technical assistance to suppliers, vendors and subcontractors to bring about environmental friendly solutions. About 35 per cent of the affiliates require minimum standards of its suppliers, and these requirements are predominantly related to securing product quality rather than controlling for specific environmental demands on products and processes. However there are notable exceptions. Sony Electronics (M), a large Japanese audio electronics manufacturer has developed a pilot program for ISO 14001 certification of SME suppliers and subcontractors (for more details see text box). The pilot program is the first step towards having more of its suppliers and subcontractors become involved in

**Pilot project for ISO 14001 certification of SME subcontractors/suppliers at Sony Electronics Malaysia (SEM)**

Sony has decided to make the international EMS ISO 14000 standard the organizing principle for all its companies. The BS 7750 standard was the first formal attempt at EMS within SONY. Since July 1994 however ISO 14001 has become the global platform upon which Sony environmental activities are built. This development follows the trend in Japan which has the largest number of companies in the world certified with ISO 14001 (by May 1998, 973 Japanese companies out of a world total of about 4000 companies (Focus Japan, October 1998). SEM was the 1<sup>st</sup> Malaysian company to be ISO 14001 certified.

As part of a Sony Electronics (M) pilot programme for ISO 14001 certification of SMEs, SEM has assisted two of its suppliers and subcontractors in becoming ISO 14001 certified. One is a waste management contractor and the other is a supplier of card board packaging.

Sony has assisted in the training of the SME employees, and has helped overcome implementation barriers associated with the new ideas/thinking behind an environment management system. According to the general manager of the waste management company: "The new ideas has to be fed to the management and employees, absorbed and the theoretical ideas have to be put into practical terms". Sony also works as an advisor to the subcontractors' environment committee.

For Sony this is a first step to have more of their contractors and vendors become ISO 14001 certified. And there is an ongoing discussion in SONY corporation whether to make ISO 14001 certified suppliers/vendors the "preferred suppliers". SEM considers this a powerful incentive for its suppliers, but there has been a general trend of reluctance. "They can't see how they can make money, the incentive from ISO 14001 is low despite the small capital outlay. There is also a vacuum of expertise in SMEs in terms of environment management resources. Sofar SEM concentrates on its own suppliers. "When the time comes, the 1<sup>st</sup> layer suppliers will encourage the 2<sup>nd</sup> layer suppliers".

One of the driving forces behind Sony Corporation and its sister companies choice to proactively work on environmental management is because they expect new environment related tariff barriers based on product and organizational performance. "While it is not a problem right now, it will be in the foreseeable future", says the senior environment manager of Sony Electronics (M).

environmental management. Other driving forces apart from the directions of

Headquarters include the cost effectiveness of improved waste management, materials handling, reduced energy use and better transport management. The potential role that may be played by big foreign TNCs as big brother, in a mentor - mentee relationship is far from being exhausted in Malaysia.

### ***Subcontracting of waste handling***

TNCs handling of their waste management presents a special case of the TNC-subcontractor relationship. 54 per cent of the respondent companies report that they subcontract their waste handling. For TNC subsidiaries and affiliates, outsourcing of waste management activities is to some degree, a question of letting others outside your own organizational boundaries handle your environmental problems. Companies have gotten used to having specialized waste handling companies taking care of its waste, but this is not a division of work which should be taken for granted<sup>8</sup>. The interviews reveal that the TNCs don't know how their waste is handled and that it is not a case for serious concern. The foreign subsidiaries are primarily interested that the waste management companies are certified to handle industrial waste. The waste management sector is improving its practices, but there are still examples of companies dumping the waste outside the designated landfill areas (ISIS 1999).

In a local Kuala Lumpur branch of the FMM (Federation of Malaysia Manufacturers), a collective attempt was made for the largest foreign paint manufacturers to collect paint waste and used drums (for recycling). This was turned down by the paint companies, a reason given was that the waste amounts from individual companies were small and that it would be too costly for the paint manufacturers. The FMM branch has not abandoned the idea as yet.

Especially hazardous and toxic waste continues to pose a problem in the Malaysian context. This finds support in our results, the large TNC affiliates point to lack of environmental infrastructures as a significant problem to them. There has until 1998/1999 not been a public nor a private facility for handling, storing and disposal of toxic and hazardous waste material. In this situation, foreign and domestic companies alike have been forced to either store the waste on their own premises, export it or to dispose of it illegally. The foreign companies seem to have applied the two first options. The idea to have a central deposit for hazardous waste was first introduced in 1992. Since then a joint Danish/German integrated hazardous waste management project "Quality Alam" has been underway as part of a Danish environment cooperation (DANCED) program for sustainable industrial partnerships. The delay in completion of the facility has exacerbated the storage problems for especially the SMEs. Given the circumstances, factories continue to apply for contravention licenses to discharge wastes (Rahim, 1997).

Waste handling is by most companies in the survey not considered a core business of the firm although some companies use recycling as an income generating activity.

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<sup>8</sup> In Germany e.g., the producers are required by law to take back the packaging material.

Often the special machinery for recycling of materials are only available at specialized waste handling companies. There are however examples of companies where the waste management is considered critical to the public image. In a large electronics manufacturer they report in an interview that they have reserved a special place within the plant for initial recycling of waste. Companies are subcontracted to work within these premises. E.g. the company does not allow its contractors to bring the plastic covers with the company brand name on outside company premises before they have been crushed and the parts are no longer identifiable. For the contractor this means that he has employees working in the TNC's factory doing initial sorting and handling of waste.

The industry of waste handling in Malaysia is growing, and it is possible to be certified/authorized by government to handle industrial waste, and the DOE encourages companies only to use certified waste handling companies. There still is a lack of environmental infrastructure for certain kinds (toxic and hazardous) of waste. The solution chosen by interviewed companies is to keep them in stock until a solution is available.

These findings on TNCs handling of waste management suggest that even though it is a common practice to subcontract waste management, the affiliates exercise limited control over the handling of their waste, and what is more show little interest in the outcome and effects on the external environment.

### ***Outsourcing of other environmentally sensitive operations and processes***

The reach of TNCs concerning their opportunities for influencing the environmental practices of suppliers and subcontractors may go beyond the positive transfer and spill-over of environmentally friendly management practices. In addition to waste management we can think of other boundary crossing production processes where outsourcing of environmentally sensitive operations and processes take place. With the exception of one company the respondent companies have not volunteered information about this. We are therefore not in a position to say how widespread the practice is in Malaysia and to what extent outsourcing activities are impairing the environment.

In one of the companies interviewed, the process of mixing carbon blacks was left to a small local subcontractor. The production capacity is available in-house and is still used when the demand exceeds the capacity of the supplier. But the management has difficulties persuading its employees to do the particular task, because it is a very dirty and dusty process. Asked about the potential health hazard involved the general manager replied that he did not think that there was a health hazard involved.

In another case reported by a Malaysian government official, Taiwanese companies in Malaysia are known to subcontract the strongly polluting dyeing of yarn to local SMEs. According to the official, the practice of outsourcing environmental sensitive processes used to be quite common in the Malaysian industry. Large companies would squeeze and exploit small suppliers, and in the local SMEs' efforts to cut costs, pollution control was the first cost item that they let go of. With the gradual introduction of ISO 14001 in

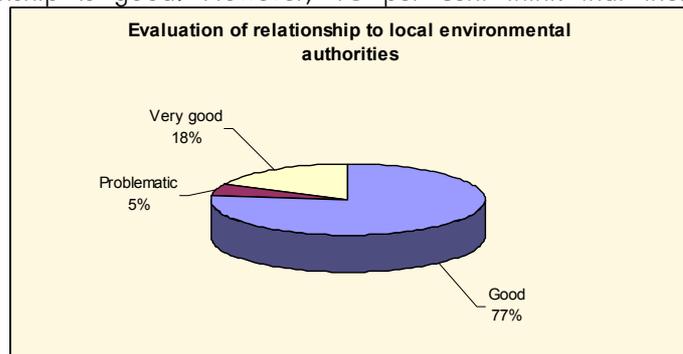
Malaysian industry since 1997, the DOE has observed that foreign companies to a larger degree engage themselves in dirty processes in an attempt to obtain control of additional areas of production that affects organizational and environmental performance. If this is indeed an emerging tendency, it could be hypothesized that the growing awareness of different market actors are contributing to improved environmental performance in the nexus between TNC affiliates and their suppliers and subcontractors.

But so far, the absence of more formalized technical and managerial cooperation within environmental management reflects a more general phenomenon: the underdevelopment of linkages and cooperation practices among TNCs and local firms in the Malaysian industrial sector. An observation that is also made in other developing countries (see Chudnovsky et al, 1999).

### 2.3.4 Environmental relations to local authorities

The respondent TNCs generally report to have 'good' working relationships with the environmental authorities: DOE and Department of Health and Safety (DOSH). About 18 per cent find that their relationship to primarily the DOE is very good and 77 per cent say that their relationship is good. However, 18 per cent think that their

relationship is 'problematic'. Based on the company feed back, problems may owe to the experience of insufficient government knowledge of specific processes and the sometimes arbitrary governing of

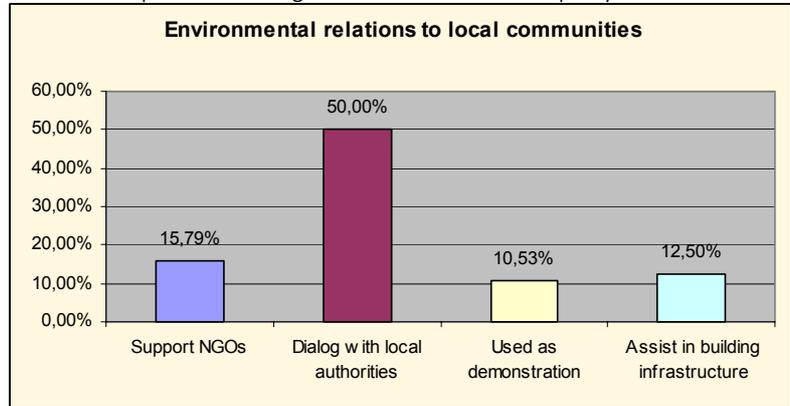


environmental regulation, e.g. in the granting of more lenient practices for some companies, especially large local owned companies.

Whereas companies indicate that the outline and extent of environmental regulation is not very different to what they are used to at home, there are some areas of specialized company activity which are not covered by Malaysian regulation. The dialogue between companies and the environmental authorities is quite extensive. Ranging from annual inspections of machinery and effluent quantity and quality to consultations on ISO 14001 certification and discussions of issues of waste management. One company reports that they were asked by the DOE to use a DOE designated consultant to do an assessment of the need for an effluent treatment plant. Another company likewise reports that the DOE has required them to design a treatment facility for latex water effluents. However, a larger likewise foreign owned latex factory had not been required to invest in a treatment facility. This could be seen as an illustration of inconsistencies in the enforcement practices.

The cooperation with the environmental authorities rarely involves the use of companies as examples on how to solve specific environmental problems. This owes to the environmental authorities' lack of detailed knowledge of company products and processes and to some degree to the reluctance of the companies to be involved with the authorities on this. An example illustrating this is a Danish company's use of state-of-the-art

technology for sterilization and reduction of the exhaust of ammonia and cyclohexanol. The technical manager at headquarters in



Denmark is worried that Malaysia has no regulations on emissions of ethylene oxide as is the case in Denmark. The DOE inspected the equipment before it was taken into use, but so far it has had no spin-off effect on Malaysian legislation. And the Danish company does not want to push for such a legislation. "We don't want to be persona non grata in the Malaysian industry. We have no desire to be a pioneer, and revolutionize the world, we are content with living up to what we perceive to be sound environmental behavior". For the Danish company it is a question of proper business ethics and anticipating future legislative requirements in its investment strategy.

The data also reveals that it is rare to assist in setting up environmental infrastructure (common effluent treatment plants, waste management facilities, incinerators etc.) which is used by other companies.

### ***Industry as a partner for Government***

The respondent companies also work through their industry representatives, notably MICCI (Malaysia International Chamber of Commerce & Industries) & FMM (Federation of Malaysia Manufacturers) which are two of the main spokes persons of Malaysian industry<sup>9</sup>. MICCI in particular promotes the interests of the international investment community and has a standing committee, the environment committee that has the objective of "considering matters affecting the relationship between industry and the environment, and to create a bridge between industry's views and Government". Also, the committee aims at increasing environmental awareness among industry.

Private business is involved in cooperation with the DOE on matters of discussing and setting environmental standards. All major industries are represented in the Environment Quality Council, and in the National Committee on Environmental

<sup>9</sup> Very few of Malaysia's estimated 25,000 SMEs are members of these large professional organizations. Some SMEs are organized into smaller branch organizations.

Standards (NACES), where industry and government work on drafts for ISO standards, locally and internationally. It is illustrative of this working relationship that the senior environment manager of Sony Electronics (M) is an official representative of Malaysia in the international negotiations of the ISO 14000 series.

Working through the Business Council for Sustainable Development Malaysia (BCDSM) is likewise believed to be an effective means of influencing current environmental legislation and to promote voluntary action within Malaysian industry. The BCDSM consists of big corporate business representatives from e.g. Nestle, Shell. The chairman is the former Director General of the DOE, Dr. Abu Bakar.

## 2.4. Summary

As a conclusion to the section on environmental management practices, we can say that there is a strong positive relationship between company size and the extent of their cross border environmental practices.

The evidence further suggests a strong influence from corporate headquarters. This influence is particularly apparent in two respects. Affiliate environmental policy is often formulated by headquarters. And the primary motivating force behind actual or considered EMS certification in half the companies stems from the parent company.

Room is however left for the subsidiaries to maneuver locally, policies are localized and apart from the requirement to comply with the environmental policy of Malaysia, headquarters does not impose local standards and rarely set specific targets for environmental management. Furthermore, for the majority of companies, the environment is not a formalized part of reporting. Again, the large companies stand out as exceptions.

From the survey findings, we saw that the practice of formalizing and imposing environmental requirements on suppliers and subcontractors is relatively rare in Malaysia. The process most often subcontracted is waste management, but there is little or no direct involvement of the TNC affiliate, and the respondents rarely know what happens to their waste once it leaves the factory premises.

## 3. The Determinants of Environmental Management Performance in Malaysia

This section explores a/o. the main drivers providing an impetus to improved environmental performance in Malaysia. The contextual factors inherent in Government policy, market forces at the domestic and international level, and pressure from the parent company are analyzed with a view to identifying the main determinants of TNC environmental behavior in Malaysia. This section also looks at the main constraints on

environmental improvements from factors such as lack of environmental policies/, financial constraints, infrastructural constraints, and low environmental awareness. These questions are considered important when deciding under which circumstances TNC affiliates may be expected to improve their environmental performance. The survey may in this way shed further light on the inherent academic and political discussion whether it is regulative factors, market factors or the influence from the parent that determine the environmental management performance of TNC affiliate companies in developing countries.

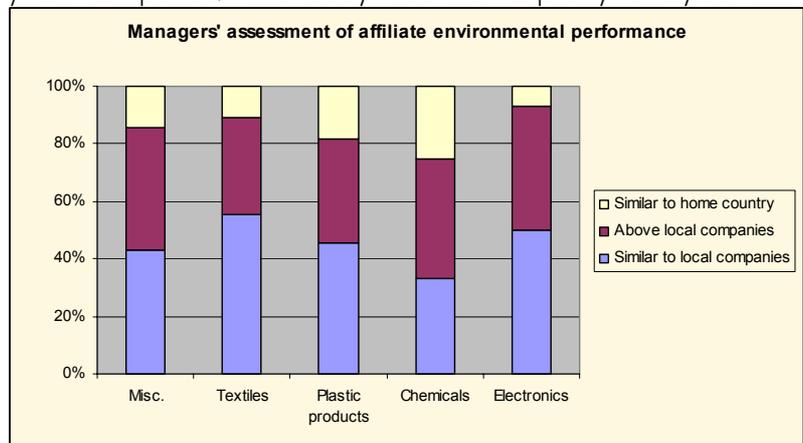
### 3.1 Main drivers of environmental management

TNCs are poised between global integration and local adaptation. Westney (1993) has proposed that TNCs with subsidiaries and affiliates in several host countries are part and parcel of two or more possibly conflicting institutional environments. Seen from the perspective of the TNC subsidiary, the institutional environment comprises the setting in the home country of the parent and the local context in the host country. A main question posed here is thus what is the main point of orientation and comparison of foreign transnationals in Malaysia and what are the factors that predominantly lead companies to change environmental behavior.

#### 3.1.1 Environmental performance of affiliates

As a starting point, we can measure the relative performance of TNCs in comparison to the domestic Malaysian companies. The study has not explicitly analyzed the

environmental management performance of domestic companies. For the comparison we therefore rely on the claims of TNC affiliate management based on their



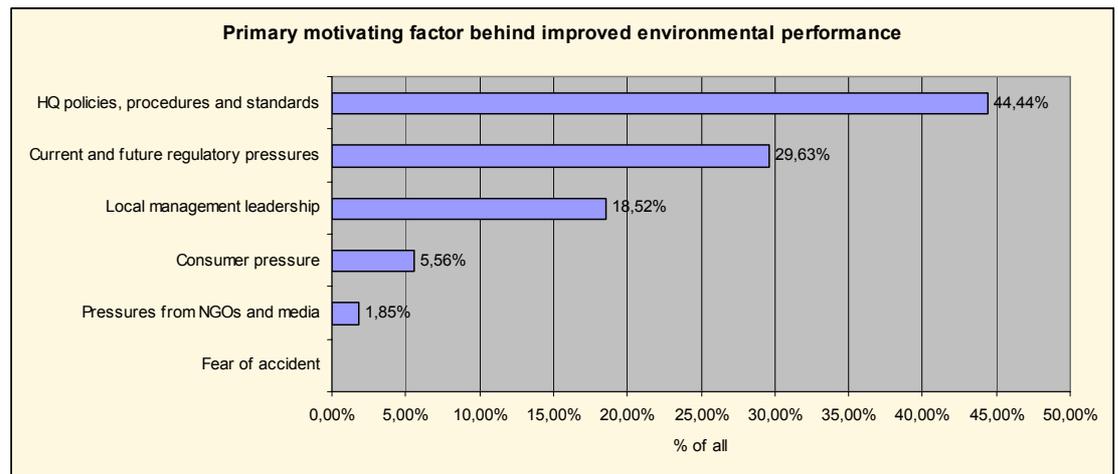
more or less well defined experience. It is found that 45 per cent of foreign TNCs in the sample assess that their performance is equivalent to local companies. 40 per cent think that their performance is above average local standards. And 15 per cent believe that their performance is similar to the parent company. Managers in the chemical industry are significantly more inclined to report performance equal to home country standards than are managers in the textile and electronics industry.

### 3.1.2 Major driving forces behind environmental improvements

Foreign companies in the sample primarily associate improvements in their environmental performance with 3 factors: The affiliation with headquarters, present and future regulation in Malaysia and local management leadership.

#### **The role of headquarters**

Many companies point to their affiliation with a parent company or their position in a TNC-organization as explanatory for their environmental performance. 44 per cent say that HQ policies, procedures and standards is the main motivating factor that have



encouraged the company to improved environmental performance. The affiliates point to the influence from a parent company that is used to a stricter regulation and enforcement in highly developed countries. From this follows the pressure from formal policies and standards. The same conclusion was reached in an UNCTAD study of the environmental management practices of large multinational companies (UNCTAD, 1993).

#### **The role of local management leadership**

It is interesting to note that 1/5<sup>th</sup> of the affiliates cite local management leadership. In the literature on corporate environmental management, the importance of change agents is stressed. The initiative behind environmental improvements in companies can often be found with individuals or small groups of employees that have developed a culture that is inducive of environmental change. In Malaysia likewise, there are examples of companies where the local management in a proactive way has taken on environmental improvements without the close guidance and regulation of a parent company.

#### **Regulatory pressures**

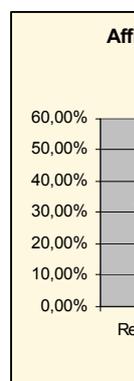
Current and future regulatory pressure is the 2<sup>nd</sup> most important factor, cited as the primary motivating factor behind environmental improvements by 30 per cent. It is apparent from the survey and the interviews that the TNC affiliates think that the extent

and coverage of the Malaysian environmental regulation is quite extensive. However when it comes to the actual implementation and enforcement, this is often found to be unforceful and inefficient. Sham Sani (1998:26) makes a note of stating that “many observers both from within and outside the country feel that while Malaysia has one of the best sets of environmental legislation, comparable even with those of some developed countries, the effective implementation of such legislation is still unimpressive”. The manpower available at the DOE and DOSH are not sufficient and the institutional and legal structures of local governments are generally not equipped for effective environmental management work.

A strengthening of the legislation and the introduction of more punitive action for environmental offences since 1985 may however explain that only 14 per cent point to weak or non-existing regulation and 8 per cent point to lack of effective enforcement when addressing the question of 1st priority barrier to improved environmental performance. Rasiah (1999) argues that there has been a shift in the governments emphasis on proper environmental behavior by industrial firms. This shift has taken place since 1990 but is most strongly felt in the substantive amendments in 1996 to the Environment Quality Act (EQA). As part of the amendments, the EQA introduced higher penalties with respect to fines and imprisonment for non-compliance with the environmental legislation. This change in government policy has certainly been noted by foreign companies and is often referred to in the interviews or in comments in the questionnaire. The Department of Environment, DOE (1997) reports an increase in the number of environmental offences prosecuted under the EQA over the years, with the exception of the period of 1985-90 when economic growth crashed (Rasiah, 1999). The DOE has also addressed the public as part of its enforcement and environmental awareness building. DOE e.g. decided to publicize in national newspapers a list of 50 large companies that were found to be in violation of the EQA or which had not installed effluent treatment facilities (SIRIM, 1998).

With the increase in fines and legal enforcement, government regulation has become an important motivating factor as is evident from the survey data. Rasiah (1999) records a connection between the shift in government policy and the high levels of FDI and falling unemployment levels from the late 1980s. He thus argues that the bargaining relationship between foreign investors and environmental authorities has shifted in the Malaysian government’s favor. This means that the government has become more selective in approving investment projects through the practice of EIA, and in providing targeted support for environmentally safer technologies. The TNC affiliates appear to anticipate further strengthening and this is cause for investment in environment. A SIRIM official put it this way: “The writing is there on the wall, clear and for everybody to see”.

It has been proposed by several authors on TNC and environment in developing countries



**Reasons for EMS certification**

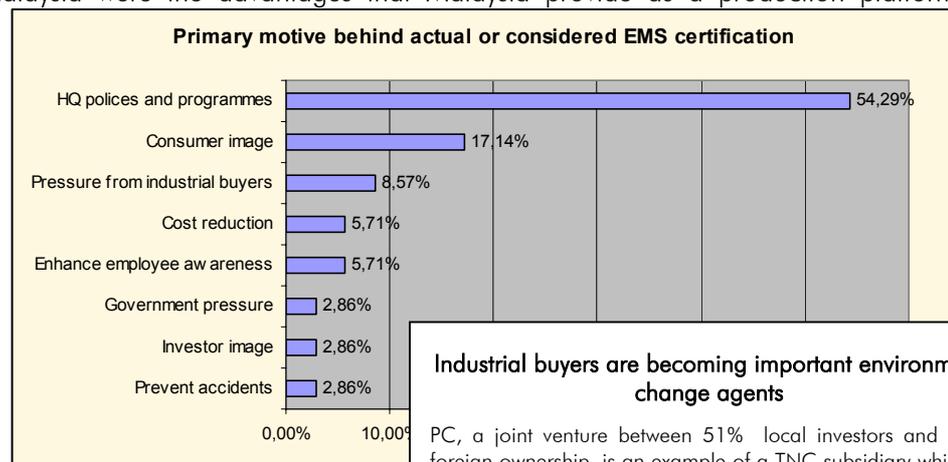
SIRIM expects the pressure for ISO 14001 certification in Malaysia to come from several sources: The electronics market in the EU is already very oriented toward third party registration to EMAS/EMAR. It is likely that there will be strong commercial and potential governmental pressure to export oriented organizations in Malaysia to conform to ISO 14001. There is strong interest and initiative in Japanese corporate organizations to develop the infrastructure necessary to a third-party certification for ISO 14001. Compliance with the ISO 14001 standard is perceived as being a positive means for business to reduce the pressure exerted by government policy and facilitate compliance with environmental legislation. There is widespread fear in Malaysian government and industry that ISO 14001 may become a market condition and that non-compliance with environmental standards will be imposed as a trade barrier (ISIS, 1998).

that companies with foreign equity are subject to stricter enforcement of environmental rules than the locally owned companies. The reasons that are brought forward are the higher visibility of foreign TNCs, their exposure to the global public eye and the demonstration effect that they may have on local companies. Our survey does lend support to this claim. While 49 per cent do not find that the enforcement level exerted on them is higher, about 33 per cent of the respondents find that they as foreign TNCs are subject to significantly stricter enforcement of environmental rules than Malaysian companies. In this connection it is worth mentioning that the Malaysian environmental legislation offers like treatment of foreign and local companies.

European and in particular UK based affiliates were significantly more inclined to report being subject to stricter enforcement than were affiliates of Asian TNCs. This may have to do with the observation that most of the European and in particular UK and German companies are members of large and globally well known corporations.

### 3.2 Market forces as a driver behind environmental improvements

More than 50 per cent of the affiliates say that the main motive for investing in Malaysia were the advantages that Malaysia provide as a production platform for



#### Industrial buyers are becoming important environment change agents

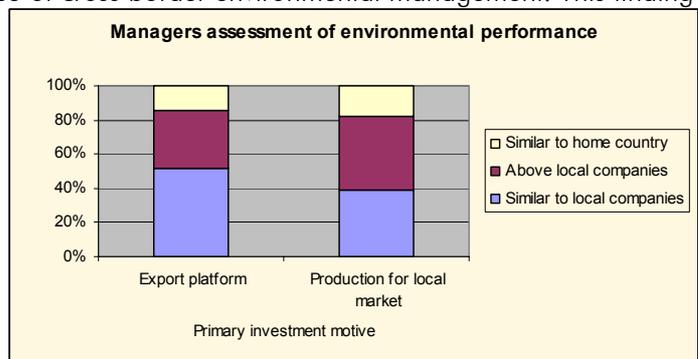
PC, a joint venture between 51% local investors and 49% foreign ownership, is an example of a TNC subsidiary which is increasingly becoming integrated in the global automobile production network and is affected by the large automobile manufacturers' growing inclination to apply environmental product and process specifications to their suppliers. Originally the company was established in 1988 to cater for a protected domestic Malaysian automobile market and to avoid paying import duties on imported finished goods, by producing automobile parts for the OEM (original equipment manufacturing) and replacement market. With the economic downturn and faltering demand from the Malaysian car market has since 1997, PC has embarked on a diversification into general industrial use and OEM production of automobile parts for export. The export strategy is further encouraged by the depreciation of the Malaysian Ringgit. The pressure on automobile manufacturers to become green, has prompted a response through out the supply chain, and suppliers are faced with the challenge to improve their environmental practices. Sofar PC has attended a ISO 14001 training seminar hosted by Toyota Malaysia as part of Toyota Malaysia's plans to become EMS certified. According to the general manager, environmental specifications is not a thing which PC is faced with now, but he feels sure that it will be a future requirement. "The large automobile manufacturers are beginning to formulate environmental specifications. These requirements will entail the substitution of poisonous and slightly poisonous powdered chemicals for less hazardous water solvable chemicals. "We can enable ourselves to produce that with difficulty, but it will mean a competitive edge once we have it in place".

exports. TNCs producing for export markets have additional concerns other than the domestic legal and regulatory framework. They are also concerned with the reception of their products by the consumers, industrial buyers and their overall reputation with its stakeholders. They are integrated in global production and distribution networks and are thus affected by events and conditions that apply to the entire TNC-organization. Based on this,

export oriented companies would be expected to have more advanced environmental practices than companies oriented towards the Malaysian market. This argument is in line with the proposition made by Porter et al, (1995; Clark, 1993) that green markets encourage environmental responsiveness in international operations. In line with this hypothesis, research conducted by Jenkins (1999) suggests that, foreign companies' export market orientation is a major determining factor in the environmental practices of TNC-affiliates in Malaysia.

This finding is not entirely sustained by the present study. While a positive correlation between foreign firms' environmental practices and the degree of their export orientation is evident, additional factors like the influence of headquarters and government regulation seem to be far more important.

For instance, only less than 10 per cent of the affiliates reported that consumer pressures in Malaysia or OECD markets was the primary motivating factor behind environmental improvements at the affiliate. This should be compared with the observation that 44 per cent report HQ policies, programs and standards as the primary motivating factor and app. 30% local regulatory pressure. This conclusion is further supported by the observation that the by far most important reason for actual or considered certification is HQ policies, procedures and standards. In general, when applying investment motive to various dimensions of environmental management, we find that there is no significant variation that suggests that export orientation plays a major role for companies' use of cross border environmental management. This finding applies to dimensions like use of environmental policies, formalized EH&S training, use of environmental accounts and specific policies and programs for improving EH&S performance. We may thus conclude that



there is no significant difference between locally oriented and export oriented companies in the statements they make about their environmental behavior and use of cross-border environmental practices. In fact, contrary to the Porter hypothesis, the environmental performance of export oriented affiliates as reported by managers, is inferior to that of local market seeking affiliates.

The only significant exception to the overall conclusion that market factors are not among the primary motivating factors behind environmental improvements is pressures from industrial customers. Thus, it is found that pressure from industrial buyers in particular is cited as the primary motivation behind actual or considered certification by

**Pressures from industrial buyers in company M**

M is a 100 per cent foreign owned and established in 1995. Manufacturer of medical equipment; sensors and electrodes, based in Penang. The production is mainly based on assembly and semiautomated processes. 95% is imported content. There are 55 employees. The company is required by its headquarters to meet Malaysian regulation requirements, and this is encribed in the managing director's "management responsibility". Apart from an annual inspection of machines, the Malaysian authorities do not impose environmental demands. As the managing director puts it: "Environmental demands are absent in Malaysia". M. used to require a "toxic license" for a chemical gel production at its facility in Penang. This particular production process was abandoned some time ago due to its non-feasibility. M. look to its headquarters for guidance on environmental procedures and standards. This applies e.g. to work environment where similar standards as the headquarters is sought. In connection with a current move to bigger facilities, M. is e.g. looking to employ energy saving measures. 99.5 per cent of turnover is derived from exports, and 70 per cent goes to Europe. Headquarters' quality department is working on a formulation for an environmental policy and as part of this is looking into European standards, CE and ISO 14000. The main pressure for developing an ISO 14000 standard is primarily M's European industrial buyers. Secondly it is the policies of headquarters. The large industrial buyers are OEM (Original Equipment Manufacturing) customers, among others from Germany. They sell M's products together with technical equipment. Sofar M has felt the pressure from its buyers in the way that they require very specific space-reducing, materials and waste saving packaging. M has not been subjected to environmental inspections, and the requirements sofar do not include M's own processes and suppliers which are mostly non-Malaysian. However M expects environmental demands from the customers to be a future factor in determining its environmental management.

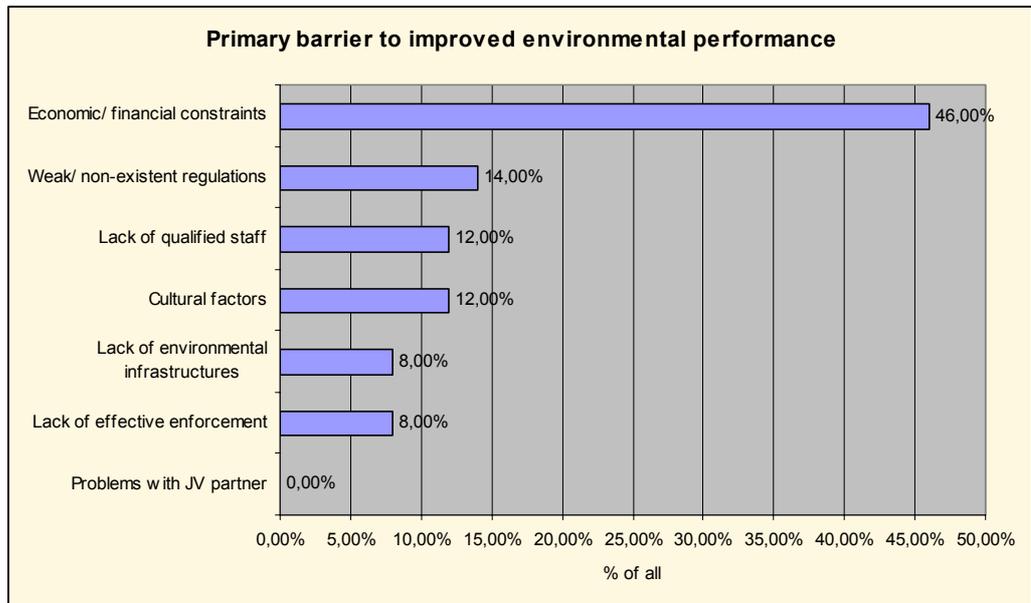
the export oriented subsidiaries; where app. 20% of the export oriented affiliates reported pressure from industrial buyers as the primary motivating factor behind actual or considered certification, none of the local market seeking affiliates did so.

### 3.3 Constraints on environmental improvements

The respondents were asked to report what are the major barriers to improved environmental performance at the affiliate. Almost half reported economic and financial constraints to be the primary barrier.

#### 3.3.1 Economic and financial constraints

The cost considerations will always be a significant factor in companies' decision to invest in environmental improvements. This consideration seems to have been



strengthened by the 1997-1998 economic recession in Malaysia and the rest of the region. Not all foreign companies have been affected to the same extent. For companies relying on foreign exports to the US and Western Europe, the effect has been small if at all detectable on levels of production and exports.

This relationship between environmental investment costs and the economic downturn has been voiced by Malaysian researchers (see Jamaluddin, 1998). Jamaluddin states that the economic downturn leads to the cancellation and slowing down of many development projects causing a situation where environmental degradation will continue to progress not only due to new projects but also due to those already in operation because of the possible cut down on operation costs. "To most companies operating cost that incur environmental concerns will certainly be the first to go at a time of economic inefficiency" (Jamaluddin, 1998:18). For TNCs relying strongly on the domestic and regional market, the added cost of investment in environmental upgrading is a burden when in many cases turnover has been halved and companies are trying to recover from falling income levels as a result of the economic recession in Malaysia. According to SIRIM (1998), many SMEs are reluctant to introduce treatment facilities and cleaner technology, because they are skeptical about the financial returns. Moreover, many local companies have traditional ways of doing things that may be difficult to change. "SMEs hate treatment plants, because it is all cost - establishing the plant, maintenance, harassment by Government officials" (CETEC, 1998).

### **3.3.2 Culture**

12 per cent reported 'culture' to be the primary barrier to improved environmental performance at the affiliate. The importance of culture as a driver or constraint is strongly related to the level of education and awareness of environmental implications of production. According to CETEC, the mixture of different ethnic cultures engaged in trade and business activities in Malaysia and the exposure to western culture has produced a very materialistic society. One characterized by low awareness of environmental implications of production and a corresponding high level of acceptance. In the survey, there are examples of TNCs where safety and health equipment like protective masks are made available to the workers, but used irregularly and not at all. Companies acknowledge that it is a management responsibility to enforce the use, but more often than not, this is not done. At a rubber manufacturing plant the workers simply refrain because of the warm climate and uncomfotability involved. However, one company in the petroleum trading industry, in an interview said that culture may explain, why the health and safety record of the Malaysian branch was among the highest in the company group worldwide. The EH&S manager ascribed this to the Malaysians' trust in authorities and the hierarchical organization of the work. The workers would adhere to company policies and guidelines without questioning them.

It is characteristic that large TNCs tend to be more aware of and focused on the managerial implications of culture. 21 per cent of the companies in the more than 500 employee category thus points to cultural factors as the primary constraining factor.

### 3.3.3 *Other constraining factors*

Other constraining factors were on the one hand the regulation and enforcement framework and on the other hand the skill factor. These factors were discussed individually and at length above. But it is worth noticing here that the small and medium sized TNCs stress lack of qualified staff and lack of effective enforcement as factors constraining their environmental performance. This may be attributed to the tendency for SMEs to rely on local expertise and manpower in order to meet its personnel requirements whereas the larger TNCs may draw on a large pool of corporate expertise and know-how.

## 3.4 Summary

The previous section identified the major driving forces behind foreign TNCs environmental management practices at the affiliate level. The results from the survey show that the companies primarily associate improvements in their environmental performance with 3 factors: The affiliation with headquarters, present and future regulation in Malaysia and local management leadership. The affiliation to the parent company and to a company group stands out as the primary driver. The affiliate companies find that the extent of environmental policy and regulation in Malaysia is extensive and the relations to the environmental authorities is considered to be 'good'. However they also point to low levels and sometimes arbitrary enforcement of policies. Apart from amending and improving the Environmental Quality Act and imposing higher sanctions on environmental offenders, the government has become more selective in approving investment projects through the practice of EIA. Targeted support for environmentally safer technologies a/o. in the form of incentives, does however not show up in the respondents' discussion of motivating forces.

Another important question addressed, was the influence of export market orientation on the environmental management practices of the TNC affiliates. Here we found, contrary to what were to be expected, that there is very little to suggest that the export oriented TNC affiliates make more extensive use of cross-border environmental management practices or have superior practices compared to the companies oriented towards the local market. Pressure from international consumers is not a strong and present factor, but rather a future influencing factor in industries like automotive industry and electronics. The export-oriented companies do however find that pressures from industrial customers matter more in their consideration of environmental certification.

The major constraint to environmental improvements reported by the respondents is economic/financial constraints. This strong orientation towards the potential cost implications of environmental improvement may have to do with the

economic downturn at the time of the data collection. The second most important constraint is weak/non-existent regulations.

#### **Cost reduction can be an important motive behind environmental improvements**

PC is in the dry-process rubber manufacturing industry which in Malaysia is considered to be a dirty industry. "We know we are a very dirty industry, we cannot run away from it, but what we can do is to make the best of what we can. We try to make our place more friendly to the workers, more safe, more clean" (General manager). In their own perception when characterizing their environmental performance, PC is above the average industry standard in Malaysia. The subsidiary is a joint venture between a foreign-based TNC and local investors, and is encouraged by the foreign parent to be environment friendly, but PC enjoys a large degree of autonomy on this and other areas. PC is not subject to strict environmental guidelines and requirements. The GM thinks that one reason that they are left alone in in this matter is that the Malaysian plant has a better environmental performance than its sister plants in China and Thailand.

The primary motivation for its environmental improvements is cost reduction through producing less discarded products, less waste and better energy efficiencies. This reflects the company's corporate policy As part of PC's corporate policy it says in relation to the environment that PC works towards: *"promote harmony with society and environment to become a trusted member of the community. Mimimize waste and conserve energy and resources in the manufacturing activity. Prevent air, water and noise pollution and minimize the use of hazardous material to ensure sustainable development and friendly environment."*

## **4. Conclusion**

The study has tried to identify and characterize the factors that drive the environmental performance of TNC affiliates in Malaysia and furthermore tried to evaluate the nature of affiliate EH&S policies and standards and the nature of the EH&S relationship with the parent company. Contrary to our initial idea we found that exposure to export markets is not a major influencing factor on affiliate environmental performance. The main influencing factor on TNC affiliate environmental management we found to be HQ policies, standards and procedures.

Another main point of orientation remains to be the local legislative requirements and the performance standards of other companies in Malaysia, foreign or domestic. All the companies in the survey practice the minimum of local legislative compliance, whereby 40 per cent find that their environmental performance is above the average local standards, and 15 per cent find that their performance is more similar to parent country standards.

The HQ is a strong influencing factor on formulation of policy and the question of EMS certification, but it seems that the operating responsibility for environmental performance is placed with the affiliate. Similarly, environmental standards, technologies used and other requirements are localized and adapted to suit the local conditions. Local management leadership for several companies is an important factor.

The growing export orientation of Malaysian industry is forcing TNCs to reorient their performance standards towards international and global settings. The pressure from western consumers and industrial buyers however is still not large enough to be reflected in better environmental performance or more widespread application of cross-

border environmental management practices when compared to local market oriented TNCs. Local consumers do not exert any particular pressure on companies to improve performance since there is an apparent lack of environmental concern and consciousness among the large Malaysian public.

Even though market forces does show in the export oriented companies, pressures from especially industrial buyers will become a future factor that may require more of TNC affiliates and their suppliers and subcontractors. The idea proposed in the introduction is relevant, namely that TNCs in Malaysia seem to be in midstream between global integration and local adaptation as to how they orient and direct their environmental management. But the forces pulling TNC affiliates we found to stem from the position in a group of internationally oriented companies in a TNC group rather than the influence from market factors such as industrial buyers and consumers. When this is said, we have to acknowledge that this study does not provide answers to what is driving the environmental policies and performance of TNCs at the global corporate level. This would require studies of a complex of several sets of influencing home country factors as well as political and regulatory factors on the global level.

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# Appendix

## I. List of interviews

CETEC (Centre for Environmental Technologies), Petaling Jaya, May 1998

SIRIM, Environmental & Energy Technology Centre, Shah Alam, May 1998

SIRIM QAS, Environmental Management Certification, Shah Alam, December 1998

PE-Research, Planning & Economics Consultants, December 1998

SERI (Socio-Economic & Environmental Research Institute), Penang, December 1998

DOE (Department of Environment, Malaysia), Kuala Lumpur, May 1998

Dr. Abu Bakar, former Director General of the DOE and presently chairman of the Business Council for Sustainable

Development Malaysia (BCDSM), May 1998.

PORIM (Palm Oil Research Institute Malaysia), May 1998.

ISIS (Institute of Strategic and International Studies), Kuala Lumpur, May 1998.

Business Council for Sustainable Development Malaysia (BCDSM), May 1998

National Committee on Environmental Standards, May 1998

3rd World Network, Penang, May 1998.

## II. TOR for Survey Data Collection

A set of terms of reference (TOR) for survey data collection was agreed with a small private Malaysian consulting company, PE Research. The TOR assigned responsibility for PR Research to do the sampling of companies, mailing of the questionnaire and collection of data from the companies. The sampling, mailing and collection of questionnaires took place from January to April 1999.

The questionnaire targets environmental managers and officers in charge of EH&S matters. As laid out in the TOR, PE-Research was required to ascertain the person(s) in charge of environmental management before mailing the questionnaire accompanied by two cover letters, one from PE-Research and the other from UNCTAD/CBS. Follow-up calls were made by PE-Research directly to the personnel responsible for environmental management to confirm receipt of the questionnaire and to remind them of the survey. In some cases the questionnaire was faxed again to facilitate immediate response. Almost half of the responses were received by facsimile. This according to PE-Research showed that most of the companies misplaced, lost or threw away the questionnaire. Out of the 250 firms, only 19 firms sent back the completed questionnaire by mail after follow up calls and reminders. 8 firms were interviewed over the telephone. All Danish firms except for one plus one Japanese were interviewed on site by the author. In a few cases it was necessary for PE Research to make on-site interviews in order to obtain responses. Also PE-Research has approached companies to have them elaborate on or elucidate outstanding questions and questions of uncertainty. After the initial deadline of end of April 1999, a total of 56 responses were collected. The remainder have been delivered to PE-Research over a period of about 1-2 months afterwards.

Table 1 shows the distribution of responses by mail, facsimile, telephone interview or personal interview.

Responses	#	%
Received by mail	19	32
Received by facsimile	25	42
Interview over telephone	8	14
Interview face to face	7	12
Total	59	100

Source: PE-Research and CBS

The survey deals with a very specific topic and most companies in the sample of 250 companies do not have an appointed EH&S manager. Therefore the person(s) in charge of environmental management have widely different job categories and job titles. Most often PE Research was directed to the Managing director, the General

Manager, the Factory/Plant Manager, the Production Manager, and the Human Resource or Personnel Manager. In 16 cases the company had a specific environmental manager.

Final list of 250 firms selected by Country and Industry

		Industry Sector				
Country		Textiles	Chemicals	Electronics	Others	Total
European firms	Denmark	-	2	2	8	12
	Germany	3	8	4	-	15
	Italy	1	--	1	-	2
	Sweden	-	1	4	-	4
	Netherlands	-	-	2	-	3
	France	1	-	1	-	2
	Switzerland	1	2	2	-	5
	United Kingdom	4	11	8	-	23
	<i>Sub-total European firms</i>		10	24	24	8
OECD countries	USA	1	8	17	-	26
	Australia	2	3	1	-	6
	Canada	1	-	3	-	4
	Japan	10	23	16	-	49
	Korea	-	1	1	-	2
<i>Sub-total Non-European OECD firms</i>		14	35	38	-	87
<i>Non-OECD countries</i>		52	25	20	-	97
<b>Total firms mailed out</b>		<b>76</b>	<b>84</b>	<b>82</b>	<b>8</b>	<b>250</b>

Note: Other industry sectors besides the three chosen sectors were taken only for Danish companies.

Non-OECD countries basically are Taiwanese and Singaporean firms