Corporate Environmental Responsibility in Singapore and Malaysia

The Potential and Limits of Voluntary Initiatives

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Acronyms

ASEAN	Association of Southeast Asian Nations
BOD	biochemical oxygen demand
CAP	Consumers Association of Penang
DBS	Development Bank of Singapore
EDB	Economic Development Board
EIA	environmental impact assessment
EMAS	European Environmental Management and Audit Scheme
ENSEARCH	Environmental Management and Research Association of Malaysia
ESCAP	Economic and Social Commission for Asia and the Pacific
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
IBM	International Business Machines Corporation
ISO	International Organization for Standardization
MICC	Malaysian International Chamber of Commerce and Industry
MIDA	Malaysia Industrial Development Authority
NGO	non-governmental organization
NITC	National Information Technology Council
OECD	Organisation for Economic Co-operation and Development
PAP	People's Action Party
PROKASIH	"Clean River" Programme of the Indonesian Ministry for Population and Environment
SAM	Sahabat Alam Malaysia
SCIC	Singapore Chemical Industry Council
TNC	transnational corporation
UNCTAD	United Nations Conference on Trade and Development
UNCTC	United Nations Centre on Transnational Corporations
UNRISD	United Nations Research Institute for Social Development

Summary/Résumé/Resumen

Summary

The neighbouring Southeast Asian countries of Singapore and Malaysia have contrasting environmental reputations. The small city-state of Singapore, with a population of 4 million and a population density of around 6,150 per square kilometre, is often seen as a model green city. That reputation rests partly on its efforts to control urban congestion and pollution, as well as the retention of green landscapes within the built environment. Malaysia, on the other hand, with a total population of around 20 million distributed between the comparatively urbanized peninsula and the less developed states of Sabah and Sarawak, has a poor environmental image. Deforestation, loss of biodiversity and the marginalization of indigenous populations in resource management decisions account for much of that negative image.

The real comparative environmental performance is a good deal harder to judge than immediate impressions suggest, not least because Malaysia's GDP per capita is a third of Singapore's. On current income, Singapore ranks among the world's top 10 richest countries. Its elevation to this group has been rapid, but Singapore has yet officially to accept the status of a developed country. That mantle would bring economic implications and international obligations, potentially including responsibilities under the United Nations Framework Convention on Climate Change. Government reticence aside, Singapore's affluence arguably makes Western expectations of environmental responsibility a relevant performance benchmark, particularly as its economy is built on the investment of foreign transnational corporations. Malaysia, on the other hand, is still managing the transition to an industrial society. Around a quarter of the workforce is employed in agriculture, and nearly half the population lives outside urban areas. Malaysian lawmakers have demonstrated a willingness to strengthen environmental protection, and high-income status may yet be achieved with a greater proportion of the country's land area designated as protected natural environment than in many older industrial nations. This may be a reasonable expectation, given the ecological significance of tropical forests.

Advocacy of corporate voluntary environmental initiatives—understood as actions taken to reduce environmental impacts, and promote awareness thereof, that have not been required by government regulation—to strengthen environmental management can be justified in Singapore and Malaysia, although for different reasons.

Singapore is the regional headquarters of many transnational corporations with branch establishments across Southeast Asia. Demands to demonstrate a strong environmental commitment in Singapore, especially where this extends to the ecological footprint of business organizations, may accelerate the potential environmental leadership role that transnational corporations can play. As a "developmental state", the priority in Singapore has been to maximize immediate economic opportunities while protecting business organizations from scrutiny by NGOs or the wider community. Consequently, although per capita incomes now

exceed those of many older industrial countries, interest in environmental responsibility lags behind that which might be expected on the basis of Western experience.

Malaysia has experienced a greater growth of environmental concern than Singapore, judging by the activity of environmental NGOs that seek to apply informal pressure on corporate and regulator behaviour. Surveillance by international pressure groups is also significant for resource-based industry, and this adds to pressure for voluntary environmental initiatives. Rising incomes, a significant presence of transnational corporations and official acceptance of local environmental pressure groups provide indications that voluntary initiatives are poised to play an increasing role in Malaysia. The likelihood is further increased by the World Bank's efforts to promote "informal" regulation, involving community pressure on business to improve environmental performance, and other new ways of making environmental policy.

The influences that encourage voluntary environmental initiatives, the types of action taken and the extent to which these may substitute for other forms of environmental regulation form the basis for the discussion in this paper. It begins with a review of the motivations thought to encourage voluntary initiatives over other ways of promoting environmental improvement. The extent to which voluntary action should be seen as an alternative to governmental regulation is then discussed, noting, among other issues, that such action is often closely related to regulatory enforcement. The discussion then turns to a review of corporate voluntary environmental initiatives in Singapore and Malaysia, which is based on original survey results from a sample of foreign-owned transnational corporations in both countries. The concluding section comments on the significance of voluntary action observed in Singapore and Malaysia.

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Résumé

Singapour et la Malaisie, pays voisins d'Asie du Sud-Est, ont des réputations diamétralement opposées pour ce qui est de l'environnement. Le petit Etat-cité de Singapour, avec ses quatre millions d'habitants et une densité d'environ 6.150 habitants au kilomètre carré, apparaît souvent comme un modèle de cité verte. Cette réputation tient en partie à ses efforts pour limiter l'engorgement et la pollution en ville, ainsi qu'aux efforts réalisés pour que des paysages de verdure subsistent au milieu des constructions. La Malaisie, en revanche, avec une population totale d'environ 20 millions, répartis entre la péninsule relativement urbanisée et les Etats moins développés de Sabah et de Sarawak, offre une piètre image environnementale. Le déboisement, l'appauvrissement de la biodiversité et le fait que les populations autochtones sont tenues à l'écart des décisions relatives à la gestion des ressources en sont en grande partie responsables.

Au-delà de ces impressions immédiates, il est très difficile de juger de ce qu'il en est vraiment de l'environnement dans les deux pays, ne serait-ce que parce que le PIB de la Malaisie par habitant est le tiers de celui de Singapour. Les recettes ordinaires de Singapour la classent parmi les dix pays les plus riches du monde. Elle s'est rapidement hissée à ce rang mais n'a pas encore officiellement le statut de pays développé. Celui-ci entraînerait des répercussions économiques et des obligations internationales, dont éventuellement des responsabilités en vertu de la Convention-cadre des Nations Unies sur les changements climatiques. Les réticences gouvernementales mises à part, la richesse de Singapour fait sans doute des attentes occidentales en matière de responsabilité environnementale un critère de performance parfaitement applicable, d'autant plus que son économie repose sur les investissements de sociétés transnationales étrangères. La Malaisie, de son côté, négocie encore son passage à la société industrielle. Environ un quart de la main-d'œuvre est employée dans l'agriculture et près de la moitié de la population vit hors des agglomérations urbaines. Le législateur malaisien a montré sa volonté de renforcer la protection de l'environnement et la Malaisie pourrait se hisser au rang des pays à haut revenu en ayant proportionnellement une superficie plus vaste de parc naturel protégé que beaucoup de pays industrialisés de longue date. On peut raisonnablement le penser, vu l'importance écologique des forêts tropicales.

Les initiatives environnementales volontaires—définies comme des actes destinés à atténuer les effets sur l'environnement et à les faire mieux connaître sans qu'il y ait obligation légale d'agir dans ce sens—que peuvent prendre des entreprises pour renforcer la gestion de l'environnement se défendent à Singapour et en Malaisie, mais pour des raisons différentes.

Singapour est le siège régional de nombreuses sociétés transnationales implantées, au travers de filiales, dans toute l'Asie du Sud-Est. Si elles se sentent obligées de se montrer écologistes convaincues à Singapour, surtout si leur image est en jeu, il y a de bonnes chances que les sociétés transnationales jouent plus vite que prévu un rôle moteur dans la protection de l'environnement. La priorité de Singapour en tant qu'"Etat développemental" a été de maximiser les débouchés économiques tout en protégeant les établissements à but lucratif du contrôle des ONG ou de la collectivité dans son ensemble. En conséquence, bien que les revenus par habitant dépassent maintenant ceux de bon nombre de pays industrialisés depuis longtemps, la responsabilité environnementale n'éveille pas l'intérêt que l'on pourrait attendre si l'on s'en tient à des critères occidentaux.

L'écologie s'est plus développée en Malaisie qu'à Singapour, si l'on en juge par l'activité des ONG écologiques qui cherchent à faire officieusement pression sur les entreprises et les organismes de régulation pour obtenir qu'ils modifient leur comportement. Des groupes de pression internationaux, de leur côté, exercent une surveillance importante sur les industries à base de ressources naturelles, ce qui pousse encore les entreprises à prendre des initiatives volontaires en matière d'environnement. Des revenus en hausse, une présence importante de sociétés transnationales et la reconnaissance officielle dont jouissent des groupes écologistes locaux sont autant d'indices portant à croire que les initiatives volontaires vont jouer un rôle de

plus en plus important en Malaisie. Les efforts déployés par la Banque mondiale pour encourager une régulation "sans caractère officiel" en comptant sur la collectivité pour faire pression sur les entreprises pour qu'elles améliorent leurs résultats environnementaux, ainsi que d'autres modes nouveaux d'élaboration de la politique environnementale, augmentent encore les chances qu'il en soit ainsi.

Les influences favorables aux initiatives volontaires, la nature de ces initiatives et la mesure dans laquelle elles peuvent se substituer à d'autres formes de régulation environnementale sont les principales questions traitées ici. Le document commence par un examen des motivations susceptibles de faire préférer les initiatives volontaires à d'autres façons d'encourager un plus grand respect de l'environnement. Les auteurs, qui font observer notamment que l'action volontaire est souvent étroitement liée à l'application de la loi, se demandent ensuite dans quelle mesure on peut voir dans cette action une solution de rechange à la réglementation publique. Ils étudient aussi les initiatives écologiques volontaires prises à Singapour et en Malaisie en se fondant sur les résultats d'une étude originale effectuée auprès d'un échantillon de sociétés transnationales étrangères implantées dans les deux pays. Le document se conclut par des commentaires sur l'importance de l'action volontaire observée à Singapour et en Malaisie.

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Resumen

Singapur y Malasia, países vecinos de Asia sudoriental, tienen una reputación ambiental contrastante. La pequeña ciudad-Estado de Singapur, con una población de cuatro millones y una densidad de población de aproximadamente 6.150 personas por kilómetro cuadrado, a menudo se considera una ciudad ecológica modelo. La reputación reside parcialmente en sus esfuerzos por controlar la congestión y polución urbanas, así como el mantenimiento de las zonas verdes en las zonas edificadas. Malasia, por otra parte, con una población de aproximadamente 20 millones de personas distribuidas entre la península comparativamente urbanizada y los Estados menos desarrollados de Sabah y Sarawak, ofrece una imagen ambiental muy pobre. La deforestación, la pérdida de biodiversidad y la marginación de las poblaciones indígenas en las decisiones relativas a la gestión de recursos, contribuyen considerablemente a esta imagen negativa.

El comportamiento ambiental comparativo real es mucho más difícil de juzgar de lo que pueda parecer a primera vista, y menos aún porque el PIB *per cápita* de Malasia es un tercio del de Singapur. En cuanto a los ingresos actuales, Singapur se encuentra entre los diez países más ricos del mundo, pero aún debe aceptar oficialmente la condición de país desarrollado, lo que

traería consecuencias económicas y obligaciones internacionales, incluyendo posiblemente responsabilidades con arreglo a la Convención Marco de las Naciones Unidas sobre el Cambio Climático. Dejando a un lado las reservas del gobierno, la prosperidad de Singapur posiblemente convierte las expectativas de Occidente con respecto a la responsabilidad ambiental, en un indicador importante de resultados, en particular porque su economía se basa en la inversión de empresas transnacionales extranjeras. Por otra parte, Malasia lucha aún por llegar a ser una sociedad industrial. Aproximadamente una cuarta parte de la fuerza de trabajo labora en el sector de la agricultura, y casi la mitad de la población vive alejada de las zonas urbanas. Los legisladores de Malasia han demostrado voluntad para reforzar la protección ambiental, y aún puede llegar a ser un país de altos ingresos, al tener zonas rurales en el país reconocidas como áreas protegidas, en mayor proporción que en muchos países industriales más viejos. Esta expectativa puede ser razonable, dada la importancia ecológica de los bosques tropicales.

En Singapur y Malasia puede estar justificada, aunque por razones diferentes, la defensa de iniciativas ambientales voluntarias empresariales—entendidas como medidas adoptadas para minimizar los efectos ambientales y fomentar la conciencia sobre los mismos, que no hayan sido exigidas por reglamentación gubernamental.

Singapur es la sede regional de muchas empresas transnacionales con filiales en toda Asia sudoriental. Las exigencias de demostrar un firme compromiso ambiental en Singapur, en particular cuando éste se extiende a la huella ecológica de las organizaciones empresariales, pueden acelerar el papel de liderazgo ambiental que pueden desempeñar las empresas transnacionales. Como "estado de desarrollo", la prioridad de Singapur ha sido potenciar al máximo las oportunidades económicas, al tiempo que proteger a las organizaciones empresariales del examen de las ONG o de la comunidad más extensa. En consecuencia, aunque los ingresos *per cápita* superan actualmente los de muchos países industriales más antiguos, el interés en la responsabilidad ambiental está a la zaga de lo que puede esperarse sobre la base de la experiencia de Occidente.

La preocupación ambiental en Malasia ha experimentado un mayor crecimiento que en Singapur, a juzgar por la actividad de las ONG, que procuran aplicar una presión informal en el comportamiento empresarial y regulador. La vigilancia de grupos de presión internacionales también es importante para la industria basada en la explotación de recursos naturales, lo que supone una presión adicional para las iniciativas ambientales voluntarias. Los ingresos cada vez mayores, una presencia importante de las empresas transnacionales y la aceptación oficial de grupos locales de presión ambiental indican que las iniciativas voluntarias están preparadas para desempeñar un papel cada vez más importante en Malasia. Esta probabilidad es aún mayor debido a los esfuerzos desplegados por el Banco Mundial para fomentar la reglamentación "informal", previendo la presión comunitaria en las empresas para que mejoren sus resultados ambientales, y otras formas nuevas de formular la política ambiental.

Las influencias que fomentan las iniciativas ambientales voluntarias, los tipos de medidas adoptadas y la medida en que éstas pueden reemplazar otras formas de reglamentación ambiental constituyen la base del debate en este documento. Comienza con un estudio de las motivaciones que se considera fomentan las iniciativas voluntarias por encima de otras formas de fomentar la mejora ambiental. A continuación se discute la medida en que la acción voluntaria debería considerarse una alternativa a la reglamentación gubernamental, observando, entre otras cuestiones, que dicha acción a menudo está estrechamente relacionada con la aplicación reglamentaria. La discusión se centra entonces en un estudio de las iniciativas ambientales voluntarias empresariales en Singapur y Malasia, basado en los resultados originales de una encuesta obtenidos de algunos ejemplos de empresas transnacionales de propiedad extranjera en ambos países. En la última sección se comenta la importancia de la acción voluntaria observada en Singapur y Malasia.

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Corporate Greening

TNCs have recently turned their attention to environmental issues in a more coherent and active manner than was previously the case—although it remains doubtful that this indicates a permanent and substantial shift in management practice. Corporate environmentalism in older industrial countries is being encouraged by economic, political and industrial organization factors. Economic conditions support acceptance of increased environmental responsibilities, if there are opportunities to obtain market benefits and production cost savings. The existence of a "win-win" situation has been widely speculated upon but, as discussed further below, the ability to profit from investment in environmental improvement may be less than initial optimism suggested.

Political advantage is to be gained if organizations, perceiving the opportunity to accommodate the environmental challenge, portray their response as evidence of progressive responsibility (Levy, 1997). In terms of industrial organization, individual firms seeking to upgrade their environmental performance must ensure that suppliers and contractors support its investment; otherwise the risk of "contamination by association" can be a major disincentive to action. Globalization and the growth of "buyer-driven commodity chains" (Gereffi, 1994) in many labour-intensive consumer goods industries have accentuated this constraint. Such commodity chains rely on tightly specified contracting relations between independent companies, although the enforcement of contracting conditions among organizations of varying capacities and experiences is often difficult (Utting, 2000).

The form that corporate environmentalism takes can be linked to different motives for taking action. Three broad motives may be defined, each associated with characteristic actions (table 1): to gain strategic advantage; to avoid strategic disadvantage and to act responsibly (Eden, 1996; Bansal, 1997). When these motives and strategies are considered, the long-term commitment of TNCs to voluntary environmental initiatives is questioned.

Strategic advantage

Many organizations have come to believe that there is profit to be made from "green business". At the most immediate level, it is often claimed that being environmentally cleaner can bring cost savings. Pollution prevention can pay through saving resources, recycling materials at a lower cost than using new materials, and reducing clean up costs. Beyond cost savings, there is a potential market for new "environmentally friendly" products. In addition, the reputation of an organization may be enhanced by an environmentally sensitive image, which may generate good publicity and encourage customer loyalty. Longer-term benefits of "green business" may include the enhanced ability to recruit young staff, perceived to be particularly attracted to companies with progressive environmental reputations, in a competitive employment market.

Early optimism about the profitability of green marketing, however, has not been completely justified. Consumer survey evidence frequently indicates that there is an increased willingness

to pay for environmental improvements but, in practice, this tends to be limited to household products such as detergents, paper and certain food items. Even where governments have contributed to the promotion of "green" products, sales have often been low (Eden, 1996:9). Although, in market research surveys, people express preferences for "clean" products, it cannot be concluded that they will act on those preferences, nor will they necessarily believe that a "green label" is a reliable indicator of a product's qualities (Esty et al., 2000:83). Similarly, just how far the corporate world can go with "eco-efficiency" is a matter of increasing contention. Some claim big opportunities exist (Porter and Van der Linde, 1995; Flavin and Tunali, 1996) while others are sceptical about the extent of the win-win scenario (Jaffe et al., 1995). In the case of newly industrializing economies, the growth of capital-intensive manufacturing may be at the expense of local producers with methods adapted to local resource conditions. In the case of the pulp industry in Southeast Asia, for example, industrial modernization results in fewer and more capital-intensive producers that make less use of locally recycled inputs than the producers they displace (Sonnenfeld, 1999). The sustainability of green corporatism motivated by strategic advantage, therefore, will be influenced by the extent to which competitive advantage is realized.

Avoiding disadvantage

Companies may voluntarily raise their environmental standards because of the perceived danger of not doing so. They may, for example, attempt to match the behaviour of competitors, in order to avoid placing themselves at a strategic disadvantage. This disadvantage may be a loss of market share—if the strategies of competitors prove effective—or it may be a loss of reputation or standing. The impact of poor publicity can be seen in the reaction of individual company share prices to good and bad environmental news (see World Bank 2000:61). Bad publicity, in particular, has a marked effect on share values. Indeed, environmental transgressions can be more damaging indirectly, through their impact on equity values and reputation, than through the financial penalties directly imposed by regulators (Piesse, 1992). Eden (1996) points out that, according to survey evidence, over two thirds of companies see environmental issues as threats, "requiring defensive or corrective actions", rather than opportunities to open up new markets.

Corporations often view environmentalism as a means of deflecting or pre-empting new legislation, which is seen as detrimental to market advantage. To deter demands for legislation, TNC self-regulation needs to attain a high degree of credibility. This is far from straightforward as, in many countries, businesses sustain lower levels of public trust than many other institutions (Simmons and Wynne, 1993; Eden, 1996). Previous efforts to pre-empt regulation by industry self-regulation have failed, frequently because compliance with voluntary codes has been weak (Roht-Arriaza, 1995:534).

Acting responsibly

The above motivations lead to voluntary environmental actions that are, to varying degrees, the incidental by-product of profit-driven actions. Other pressures on business, which have less immediate linkage to profit or returns on investment, are adding to the acceptance of larger environmental responsibilities than in the past (Patten, 1991). This is frequently discussed in

terms of the need for business to establish legitimacy in the eyes of consumers, the public at large and government—legitimacy being defined as a "generalised perception or assumption that the actions of an entity are desirable, proper or appropriate" (Suchman, 1995:574).

Beyond the need to keep pace with changes in what society perceives to be acceptable, environmentally sensitive business organizations are facing new demands to demonstrate their legitimacy as their global reach increases (Grolin, 1998; Rodgers, 2000). This is because, it is argued, the legitimacy conferred by national governments through regulation, law and representation of public opinion has lessened due to the political emphasis on deregulation and the internationalization of business activity. In this vacuum, corporate business has been under pressure to find new sources of legitimacy. Environmental performance is especially affected by this because of the high profile and scientific uncertainty of environmental issues, as well as public scepticism about the effectiveness of government regulations (Jacobs, 1997:56). To bolster their reputations, businesses are being encouraged to seek the acceptance and endorsement of major stakeholder groups, giving rise to so-called "extended stakeholder management". To keep this dialogue within manageable proportions, partnerships between corporations and environmental NGOs have become one method of implementing extended stakeholder management (Lober, 1997).

The extent to which engagement with stakeholders will continue to be viewed as worthwhile is uncertain. Corporate engagement with environmental NGOs is partly predicated on the belief that this will contain adversarial relations with NGOs and that partnerships can be confined to specific issues rather than the overall environmental performance of the business (Murphy and Bendell, 1997). Both outlooks run into conflict with the expectations of environmental NGOs, particularly those with the greatest capacity to confer legitimacy based on their wide networks and accountability to constituencies in society (Rodgers, 2000:47). More generally, it has been argued that self-regulation does not have the capacity to increase the legitimization of business environmental practices (Eden, 1996:122). The chemical industry's code of practice, "Responsible Care", illustrates this—in the case of a sector that has particular need to retain public confidence in view of its pollution-intensity. Responsible Care requires that adherents seek to match best practice environmental management and to assist other chemical companies do likewise. Part of this involves increased information transparency. Even so, it has been argued that this has not reduced the legitimacy gap faced by the chemical industry (Simmons and Wynne, 1993). Responsible Care has left unaltered the public perception that chemical companies selectively release information about their environmental impacts and have greater influence over government than does the public at large.

Voluntary Environmental Initiatives and Self-Regulation

Across many areas of social concern there has long been a debate about the desirability of voluntary compliance as an alternative to government regulation (Hawkins, 1990; Petts, 2000). This discussion can exaggerate the independence of separate approaches and overlook the variability of command and control regulation. Enforcement mechanisms, for example, may

stress prevention and consultation or they may stress enforcement, including severe penalties for transgressing regulation. Advocates of voluntary environmental management have now joined this debate, adding their criticism of command and control regulation.

In environmental matters, advocates of voluntary approaches suggest that there are efficiency gains in giving industries a choice over their investment in environmental improvement, and less need for monitoring and enforcement agencies than where mandatory standards are imposed. In addition, the flexibility to determine their own standards and priorities is said to make businesses more positive about improvement than where regulation enforces specific actions. As well, to the extent that voluntary regulation does not depend on legislation and political agreement, it can be enacted quickly and maintain responsiveness to current problems. In practice, voluntary action can be closely dependent on regulatory enforcement for three reasons: (i) participation in so-called voluntary initiatives is frequently determined by the efforts of third parties, including government regulators; (ii) government regulation may form a benchmark against which voluntary efforts are designed; and (iii) conversion of voluntary measures into legislation is possible and not necessarily opposed by "first movers".

Third-party involvement

Voluntary environmental initiatives have grown partly because governments are influencing their design and implementation. In other words, a good deal of the activity classed as voluntary environmental improvement is not purely self-motivated. Public agencies encourage the willingness to participate by establishing frameworks or institutions that help to develop, administer or verify voluntary initiatives. Voluntary action has also been a reaction to government efforts to publicize voluntary initiatives and threats to strengthen regulation in the absence of voluntary improvement (Gouldson and Murphy, 1998). A Canadian study, for example, identified four reasons for "voluntary" action: (i) the threat of regulation; (ii) public concern and industry perception that public image affects business; (iii) financial advantage, through the direct returns from environmental improvement and improved standing with financial agencies; and (iv) peer pressure, especially that transmitted through industry associations (Labatt and Maclaren, 1998).

A potentially diverse and incoherent range of voluntary environmental initiatives tends, in practice, to be highly ordered because of the influence of external agencies in encouraging action. A threefold distinction summarizes much voluntary activity: (i) self-regulation; (ii) voluntary agreements; and (iii) voluntary challenge (Labatt and Maclaren, 1998). Self-regulation comprises action initiated by individual businesses or industry associations, as in the form of voluntary codes of practice (UNCTAD, 1996). Voluntary agreements involve some form of partnership between business, either individually or through their industry association, and government agencies or environmental campaign groups (Murphy and Bendell, 1997). Under the voluntary challenge, most of the initiative for developing, disseminating and monitoring lies with government rather than industry. Governments present the scheme as a challenge to a target community, possibly including a specified time and standard to be complied with. For example, challenges for specified reductions in toxic chemical releases or reductions in packaging may be given to groups of companies. An East Asian example is the PROKASIH

(Clean Rivers) programme introduced in Indonesia in 1989 that is credited with eliciting substantial pollution reduction from industrial plants in 11 provinces and 23 river basins (Afsah et al., 1996). PROKASIH covered about 5 per cent of Indonesian manufacturing facilities but was conceived as a prelude to formal comprehensive regulation (Pargal et al., 1997).

Regulation as a benchmark

Mandatory targets and regulatory controls are often an important reference point for voluntary action (Gouldson and Murphy, 1998). For example, one of the concerns expressed by business in complying with certified environmental management standards is the uncertainty as to appropriate improvement targets (Netherwood, 1996). Progressive businesses may be prepared to exceed regulatory minimum standards, but a framework of regulatory standards and systems may be looked to as a performance benchmark. A statutory benchmark is needed, for example, to capture reputation advantages from behaviour that exceeds the compliance standard. In addition, government agencies may devise and monitor voluntary programmes. As noted above, the threat of regulation is frequently cited as a prime motive for participation in voluntary initiatives. It is important, therefore, that voluntary initiatives are recognized by government regulators if they are to forestall mandatory controls.

Relationship to mandatory regulation

One effect of business participation in voluntary action is frequently to curtail mandatory regulation, but it is doubtful that this ultimately persuades governments not to act, or that businesses necessarily have this as their intention (Roht-Arriaza, 1995; Eden, 1996). In industrial countries, the pressure to initiate, integrate and strengthen environmental regulation is strong. This pressure reaches newly industrializing economies through concern to maintain access to industrial markets and through obligations under international environmental agreements (Deans, 1998; Esty et al., 2000). In this context, voluntary action is more likely to delay new regulation rather than entirely displace it. Nonetheless there is still an incentive to be a "first mover", as this can provide an opportunity to influence the form that regulation takes, as well as minimizing the risk of being non-compliant when mandatory controls are introduced. Furthermore, statutory enforcement may not be opposed as it reduces the opportunity for competitors to free-ride on the environmental initiatives of progressive organizations.

Corporate Voluntary Initiatives in Singapore and Malaysia

Singapore and Malaysia responded to deteriorating environmental conditions in the 1970s primarily through command and control regulation. Some positive results have been obtained from these measures. In Singapore, comprehensive regulatory standards and investment in environmental infrastructure have enabled the city-state to maintain economic growth and promote itself as a "clean, green city" (Ministry of Environment, 1992). Statutory requirements for environmental impact assessment (EIA) in respect of significant development projects are a key aspect of Malaysian regulation (Markandya and Shibli, 1995). These measures mean that the prior investigation of potentially serious environmental impacts has increased. In addition (and perhaps more importantly) EIAs provide opportunities for third parties to challenge proposals

initiated or endorsed by government agencies (see case study of Penang Hill in Harding, 1996). This is important in Malaysia because the government is often closely involved in development projects that have serious environmental impacts, such as the Bakun Dam (Rasiah, 1999:33). As well as impact assessment, a much-cited Malaysian success has been the clean-up of the palm oil industry. Although sometimes presented as evidence of the effectiveness of market-based incentives (Markandya and Shibli, 1995), the reduction in organic pollution was ultimately achieved through strict enforcement of mandatory standards (World Bank, 2000:44).

In both countries, the tightening of standards and extension of regulatory controls has been a more important response to new concerns and gaps in original environmental controls than investment in alternative environmental management strategies, either in the form of economic instruments or voluntary initiatives. Environmental policy in Malaysia and Singapore is influenced by their dependence on international trade and foreign direct investment (Bankoff and Elston, 1994). This has introduced Western environmental expectations to both countries, and standards above those demanded by domestic regulation. There is concern that standards in Western markets will be converted into *de facto* non-tariff barriers. Governments have encouraged voluntary responses, recognizing that higher standards across the board would disadvantage those businesses not exposed to international pressure. This is seen in the help given to obtain ISO14001 certification of environmental management systems, with assistance targeted toward exporters and suppliers to TNCs (Zarsky and Tay, 2000:150). Comparatively high levels of certification have thus been achieved in Southeast Asia, although not to the levels predicted by the earlier diffusion of ISO9000 certification for quality management systems (table 2). Before assessing the significance of this and other voluntary actions, we briefly review environmental issues in Singapore and Malaysia.

Environmental issues in Singapore

The Singapore government's environmental management has been driven by economic considerations (Bankoff and Elston, 1994). This has resulted in the enforcement of comprehensive land use and emissions standards, as well as investment in environmental infrastructure. The primary purpose of these interventions has been to maximize economic activity and increase population within the small city-state. A tendency to equate a clean environment with a green environment is an indicator of this, as in the Ministry of Environment-sponsored annual "Clean and Green Week" that tends to emphasize activities such as waste removal from beaches and anti-littering campaigns. Substantial gaps can be identified in Singapore's environmental performance, however, as indicated by the following issues.

First, environmental legislation omits a commitment to a formal EIA process, in contrast to other Southeast Asian countries (Briffett, 1996). Government unwillingness to introduce EIA reflects concerns about its potential to delay or inhibit economic development, increase costs and introduce "extraneous issues" into the development process. Rather than a transparent and contestable decision-making process, development decisions are made through internalized decision making under the control of state development agencies and senior government ministers (Bankoff and Elston, 1994). Advocates of EIA suggest that its absence has stifled

public debate about the environment and has resulted in inadequate attention being given to environmental considerations (Hesp, 1995; Hilton and Manning, 1995).

Second, the "green initiatives" fostered by the government's environmental agencies have not incorporated ecological principles. For example, the Nature Society has criticized the areas selected as nature reserves, noting that most are of no ecological significance, while locations important to migratory wildlife and endemic species have been taken for development (Hesp, 1995:139). Similarly, parks and roadside planting of trees give a green appearance but the vegetation is generally exotic and unhelpful to native fauna (Corlett, 1992).

Third, public environmental consciousness over issues such as product recycling, green consumerism and ecological awareness is low. Surveys of environmental behaviour among Singaporean students and women have shown that Singaporeans are generally ignorant of and resistant to incorporating environmental protection in everyday life, by minimizing domestic waste, using recycling bins and buying environmentally friendly products (Lau, 1993; Ng, 1994; Savage, 1995).

Fourth, there has been little development of an environmental leadership role by Singaporean public or private agencies in the region, despite the city-state's economic wealth and trade and investment linkages to neighbouring countries. The widespread destruction of tropical rainforest in Indonesia through illegal land clearance was seen as one such opportunity, particularly as Singaporean investors are involved in many of the illegal operations (Harwell, 2000:316). Singapore has supported ASEAN declarations and provided remote imaging technology to help monitor the outbreak of fires, but these actions have done little to stem the unfolding environmental disaster (Shepherd, 1997). Similarly, although Singapore has a major stake in the shipping and petroleum industries, it has been less important than Japan in promoting marine environment initiatives in the region (Chia, 1995).

Fifth, business in Singapore has tended to view regulatory compliance as the extent of their responsibility. An investigation of business awareness of and investment in clean technology concluded that "the public and private sectors in Singapore are not aware of cleaner production concepts" (Tay, 1995:421). It was found that local companies viewed environmental issues as a major deterrent to profit generation and typically lacked information, resources, technology and labour needed to adopt clean production. Foreign TNCs showed greater awareness and commitment to environmental management than local companies, mainly because of the need to meet the expectations of their corporate management. This research suggested that introducing stringent effluent and emission regulations would be the most effective way of advancing cleaner production, as well as offering financial incentives to companies that exceed regulation requirements.

These performance gaps arise partly from the absence of community interest in environmental issues. The island's limited land area and near total loss of natural environment has reduced awareness of development-environment conflicts. Even so, concern for the environment has

been one of the few issues that has prompted organized community action in opposition to government proposals (Perry et al., 1997). A further and perhaps more important explanation of the lack of environmental awareness in the state is maybe, therefore, the government's tight control of information on the subject.

Post-independence (1965), the People's Action Party (PAP) government has retained a monopoly on political control. The PAP has used its dominance to curtail opposition to its policies and to build an "oligarchic elite" that has "merged government, state structures and para-political organizations, and has co-opted and sponsored civil society actors" (Gomez, 1999:1). Citizen participation in issues that pose immediate development threats to the city-state, such as waste generation and water consumption, is solicited, but larger environmental activism has not been encouraged. Such activism might challenge government hopes to accelerate population growth (from the present 4 million to near 6 million) and oppose plans to increase investment in pollution-intensive petrochemical industries. It might also bring demands for greater action on regional environmental issues that would compromise the government's reluctance to criticize neighbouring governments. At present, PAP claims about its effective management of environmental issues and the necessity of its development strategies go largely unchallenged. An exception is the Singapore Nature Society, which has instigated a number of successful campaigns to protect areas of importance to wildlife. It remains as one of the few active NGOs, although co-optation of senior members has muted its voice in recent years. More generally, the political environment has acted against the development of a vocal middle class concerned about environmental or other public matters in Singapore (Jones and Brown, 1994; Perry et al., 1997). Green label products have, for example, met with little consumer interest, even among affluent consumers (Wong, 1997).

Stakeholder groups also tend to be reluctant to campaign for greater business accountability. In comparison with the role played by the International Chamber of Commerce in promoting environmental best practice in Europe and North America (Hansen and Gleckman, 1993; Brophy and Starkey, 1996), the Singapore International Chamber of Commerce has not taken up environmental causes on the grounds that its members have no interest in doing so (Teng, 1997). The Singapore Confederation of Industry did promote a revised version of the International Chamber of Commerce's Business Charter for Sustainable Development. The Singapore version omits eight clauses, including the one that calls for companies to report annually on their environmental performance and progress. The Confederation believed that disclosure would be seen as a threat, especially among Chinese-owned business that operate through a tradition of secrecy and person-to-person communication rather than written declarations and formal agreements (Teng, 1997). The Singapore Environment Council, a government-supported NGO with a remit to promote environmental awareness in the community and among business, has in recent years sought to foster business environmental responsibility. Its principal tool has been an annual Singapore Environmental Achievement Award given to an individual company demonstrating proactive environmental responsibility.

The absence of community interest removes an important source of pressure on companies. On the other hand, because of the strong presence of foreign TNCs in the Singaporean economy, corporate pressure on Singaporean subsidiaries and affiliates is, potentially, an important stimulant of voluntary action. This dual context can be seen in three sources of evidence about the incidence of voluntary environmental initiatives: (i) corporate environmental reporting; (ii) ISO14001 policy statements; and (iii) Responsible Care.

Environmental reporting

The voluntary reporting of environmental impacts and initiatives in company annual reports has become widespread among organizations accepting an obligation to extend their environmental responsibilities beyond regulatory compliance (Collier, 1995; Brophy and Starkey, 1996). A review of annual reports produced by 264 publicly listed companies in Singapore (all those with operations in Singapore) for the financial years 1995/96 and 1996/97 found that 6.5 per cent of companies made reference to the environment in both years (Perry and Teng, 1998). The content of disclosure was minimal. Two thirds of the reports with environmental references had no more than two sentences of comment. In terms of the space occupied, the most extensive reporting was by two companies that reported in both years with over ten sentences of information (a property company, DBS Land and a car distribution company, Cycle and Carriage). Neither case included any data relating to environmental impacts.

A follow-up survey that obtained a 30 per cent response from non-disclosing companies (66 out of 221) and a 45 per cent response from disclosing companies (14 out of 31) found three main reasons for the absence of significant environmental disclosure: (i) a perception that their organization had no environmental impacts; (ii) a lack of perceived benefit, either in status with consumers or within the business community; and (iii) lack of pressure from the government. Government direction to disclose environmental information was identified as the influence most likely to cause a change of practice.

The government has not sought to encourage disclosure, partly because it feels that ISO14001 is a greater priority and partly because calls for disclosure are seen as a deterrent to environmental certification. For the present, the absence of any cases approaching a serious commitment to disclosure is perhaps a more significant indicator of environmental apathy than the overall low disclosure rate. Singapore's public companies are small compared with the organizations that have invested most in environmental reporting. On the other hand, the absence of reporting among companies involved in pollution-intensive activities means that Singapore is falling behind standard practice internationally.

Representatives of three foreign TNCs, selected because of their leadership in environmental reporting in their home country, were interviewed as a further part of the study (Perry and Teng, 1998). The interviews revealed that leadership was not being transferred to Singapore. The low level of public and government interest in environmental issues was given as the reason for not disclosing information. One environmental manager commented: "the level of awareness is very low; who will care if you report environmental initiatives or not? No one

will". An organization accredited to the European Environmental Management and Audit Scheme (EMAS), advised that it would cease to report in Singapore were it not part of the EMAS requirement to distribute an annual environmental report for each operating site. The Singapore environmental manager indicated that the town council covering the factory site had asked not to receive the report they sent. This caused the manager to comment: "why create trouble for yourself when there is no requirement at all in Singapore to report such information to the public?".

ISO14001 policy statements

As noted above, the promotion of ISO14001 certification has been the main way by which the government has sought to foster voluntary action in the business community. The promotion included expenditure of around S$1million ($570,000) up to September 2000 on financial grants to local companies. These grants can provide 70 per cent of the cost of engaging a consultant, up to a maximum of S$40,000 ($23,000). Public support is also given to two industry-government committees involved in ISO promotion work, and to the Singapore Accreditation Council, a body that accredits certifying agencies to gain international acceptability. No regulatory concessions are granted to organizations obtaining certification, although government agencies may take certification into account in the allocation of their regulatory enforcement effort.

The impact of ISO14001 on business behaviour can be judged by examining the policy statements of certified companies (Singh and Perry, 2000). Examination of 52 of the first 55 certificates awarded in Singapore found that 12 policy statements made no commitments beyond necessary conditions for certification (such as the need to have top management involvement and to continuously improve the environment management system) and a pledge to comply with legislation (Singh and Perry, 2000). A similar number (14) made two or more commitments beyond those required for certification. The most frequently made additional commitments were: (i) some positive action to be taken, such as the elimination of ozone depleting chemicals; (ii) product modification to reduce environmental impacts; and (iii) work with suppliers, contractors and customers to promote environmental responsibility recognizing product lifecycle impacts. In addition, a few organizations had a commitment to exceed legislative and other regulatory requirements. IBM (Singapore) Pte. Ltd. was the sole company to include all four of these types of commitment in its policy. Overall policy statements with two or more beyond-the-minimum commitments were only produced by foreign-owned TNCs. On the other hand, with the exception of European-owned TNCs, all types of business organization included at least some organizations with minimal environmental policies.

As well as examining the policy statements, the study considered the process through which the policy had been generated, as well as subsequent implementation. Interviews with 25 organizations found four where the policy was linked to significant management priority to environmental improvement. All four were foreign-owned transnationals (the Singapore branches of IBM, Molex, Tetra Pak and Lucent Technologies).

Overall, the investigation of policy statements concluded that certification has generally induced little action among Singapore-based organizations. In some instances it would appear

to encourage no additional activity to that which is required to comply with government regulations and the minimal requirements of the certification process itself. The performance of foreign-owned companies typically falls short of the types of commitments being made by business in their home countries, but it is among Singapore-owned organizations that least change is taking place.

"Responsible Care"

The Singapore Chemical Industry Council (SCIC) officially joined Responsible Care in October 1999, having given its intention of so doing in 1990 (the interim period was taken to spread interest in the programme and to ensure a sufficient number of members had the capacity to join). The petrochemical and chemical sectors currently account for around a fifth of value-added in Singapore's manufacturing sector, and are dominated by global corporations. Singaporean economic promotion agencies have sought to capitalize on the island's long established role as an oil depot and refining base for the region to expand these activities still further (Perry et al., 1997). Land reclamation has created purpose-designed production space on offshore islands and financial incentives have offset capital investment costs. Despite the sector's extensive land requirements, and potential risk to nearby high population densities and vulnerable ecosystems, government agencies continue to prioritize the sector.

Companies that join Responsible Care accept 10 guiding principles and a code outlining expected management practices. These commit organizations to match industry best practice with respect to the health, safety and environmental aspects of their operations, to accept product stewardship obligations and to work co-operatively which each other, the community and governments to advance Responsible Care. When launched, 50 of the 180 members of SCIC committed themselves to the programme. One year later the participation had grown to 65, of which 80 per cent were foreign-owned TNCs, the prime drivers of the spread of Responsible Care to Singapore. For foreign TNCs, it provides a structure for attaining common standards among their international branches and of ensuring that suppliers and customers attain similar performance. Such concerns among foreign multinationals, rather than local pressure to participate in the programme from government or the community at large, explain the launch of Responsible Care in Singapore. Subsequently, government has given some recognition to the initiative by joining its organizing committee.

Responsible Care is new to Singapore and focuses on assisting organizations to improve working practices and reporting systems. Much of the impetus for achieving this comes from TNCs and their willingness to assist local companies. In North America, Responsible Care has been criticized as an attempt to present the industry in a favourable light so as to pre-empt new legislation and regulation (Eden, 1996). In Singapore, the programme may be credited with some positive outcomes. It provides a framework within which foreign TNCs are taking steps to extend environmental responsibility to overseas branches. This is important in Singapore, where the absence of community and other pressures have resulted in environmental issues being a low priority.

Environmental issues in Malaysia

Malaysia exhibits most of the environmental problems that are typical of many developing economies (for an overview see CAP, 1998). These include the over-logging of primary forest resulting in the loss of wildlife habitats, soil erosion and the displacement of indigenous communities; air and water pollution from industry and urban transportation, especially in the main centres of economic activity (Kuala Lumpur and the Kelang Valley, Penang and Johor) and the dumping of hazardous waste. The incidence of problems has changed with Malaysia's economic progress, but generally increased incomes have yet to be translated into improved environmental conditions (Sham Sani, 1999; Rasiah, 1999). Part of the problem is that urbanization is still increasing and this intensifies the environmental impacts from industry and population. The urban population almost doubled from 1980 to 2000 and is expected to double again by 2020 (World Resources Institute, 1997). Hence pollution problems tended to increase despite the strengthening of environmental governance in the 1990s (Sham Sani, 1999:13–15).

The overall industrial contribution to pollution shows some changes in the intensity of discharges. Particulate discharges increased in the initial phase of industrial growth but have declined from their high in the mid 1990s (Markandya and Shibli, 1995; Rasiah, 1999). Other air emissions (sulphur dioxide, nitrogen dioxide, carbon monoxide and hydrocarbons) continued to increase through the 1990s, with all emissions except hydrocarbons at least doubling between 1987 and 1997 (Rasiah, 1999). Organic pollution of water-courses, as measured by biochemical oxygen demand (BOD), dropped in the 1980s, but it has since increased, with manufacturing a major contributor to this growth of pollution (Jenkins cited in Rasiah, 1999). In 1998, three quarters of river monitoring stations recorded some degree of pollution, of which agro-sector and manufacturing were the major sources for a fifth of the rivers examined (Environmental Quality Report, 1998:9). In coastal waters, oil and grease contamination is widespread and increasing; with more restricted but important problems of copper, mercury and lead levels exceeding proposed standards adjacent to some industrial areas (Environmental Quality Report, 1998:13). A World Bank study in the early 1990s identified hazardous waste as likely to be the principal industrial pollution problem in future years (Markandya and Shibli, 1995). Hazardous waste generation increased by 18 per cent from 1992 to 1998, with the major industrial sources including metal finishing, chemicals, electronics, printing and packaging (Environmental Quality Report, 1998:9). New controls on hazardous waste were included in the Environmental Quality (Amendment) Act 1996, the original legislation having provided Malaysia's overall legal umbrella for pollution control since its enactment in 1974.

Monitoring of individual business behaviour continues to find a high incidence of non-compliance. This may reflect surveillance effort rather than attitudes to environmental responsibility, but it does suggest that business acceptance of regulatory obligations needs to be strengthened before increasing the reliance on voluntary improvement initiatives. With the exception of periods of economic slowdown (1985–1990 and 1997–1998) the number of environmental offences prosecuted under the Environmental Quality Act has increased. In 1992, for example, 130 cases were prosecuted compared with 253 in 1998 (Environmental Quality Report, 1998:51). In 1998, a total of 3,889 manufacturing industries were inspected of which 86 per cent were judged compliant with sewage and industrial effluent regulations and 78 per cent

were judged compliant with airborne emission regulations. Industries in which foreign investment dominates, such as electronics, had a compliance rate of 86 per cent and 89 per cent under the respective regulations; in the chemicals sector, the respective compliance was 88 per cent and 94 per cent. The Environmental Quality Report 1998 noted that non-compliance was frequently due to failures to maintain abatement equipment or to upgrade capacity with increases in production capacity. Such problems, it was suggested, were most prevalent among small and medium-sized enterprises, many of which were said to be operating without appropriate control equipment. The compliance checks tend to concentrate on large enterprises, with potentially the greatest impacts, and so probably do not capture the full extent of non compliance (Markandya and Shibli, 1995).

A further indicator of business attitudes toward their environmental impacts can be obtained from those who legally choose to exceed emission standards. Malaysia operates a system that allows emission levels to be exceeded on receipt of a "contravention license", for which there is a fee and associated abatement charge. There has been a large reduction in the fees so collected from the rubber and palm oil processing industries (Sham Sani, 1999:20). This improvement partly reflects the comparative isolation of individual processing facilities in these industries, making environmental impacts easier to monitor than where industry operates from urban locations (World Bank, 2000). Even with the added impetus of community surveillance it appears that environmental commitment remains a low priority. Under the licensing regulations governing "prescribed premises" (including rubber and palm oil processors) an excellent compliance record can lead to the award of licenses for more than the normal one-year period. In 1998, 20 of the 143 licensed rubber factories had been granted extended licenses (14 for two years, six for three years). Of 328 licensed palm oil mills, 97 had been granted extended licenses (70 for two years, 27 for three years) (Environmental Quality Report, 1998:22).

The limited extent of its monitoring and enforcement capacity has been identified as a critical problem with Malaysia's current environmental policy regime (Markandya and Shibli, 1995). It means that, apart from large establishments in the palm oil and rubber sectors, industry is largely self-monitored. The 1996 amendments to the Environmental Quality Act included substantial increases to the penalties for a range of environmental offences (see Sham Sani, 1999:33). This was promulgated to increase the compliance pressure on industry, although in the past courts were generally reluctant to impose maximum penalties. A public complaint system exists, and this can trigger enforcement action. An increase in the number of public complaints on environmental issues occurred during the 1990s. This took place alongside an increase in media coverage and growing public awareness of environmental issues, reinforced in the Seventh Malaysia Five-Year Plan in which environmental awareness is emphasized.

A significant difference between Malaysia and Singapore is the stronger role that environmental NGOs are playing in encouraging environmental protection in Malaysia. Long-established environmental and consumer protection campaign groups have been joined by groups representing business interests. The Malaysian International Chamber of Commerce and Industry (MICC) established an environmental committee in 1992, the same year that the

Business Council for Sustainable Development was formed. The timing coincided with the broader inclusion of environmental issues in the Malaysia Five-Year Plan and the awareness among international businesses that they were particularly exposed to any tightening of regulation. As well as providing business with collective representation to government, much of the effort of the MICC is now devoted to the organization of an environmental award, the Prime Minister's Hibiscus Award. The award recognizes organizations that have demonstrated environmental leadership, and is co-organized with the Federation of Malaysian Manufacturers and ENSEARCH, an NGO representing environmental scientists and managers. In 2000, 39 companies (36 subsidiaries of TNCs) received recognition, having met the criteria for the award.

Community-based environmental campaign groups have attained a high profile partly through their use of public law suits, a tactic that Singapore-based NGOs have avoided (Tay, forthcoming). An early and well-known example of this was the Asian Rare Earth case in which NGOs supported a group of villagers in legal action against a private company for its improper storage and disposal of hazardous materials, an action that also implicated a government agency for misadministration. The legal standing on which NGOs have sought to challenge government decisions has been unclear, but their right to participate in environmental decisions has gradually attained recognition. Thus, even though NGO action has often not been successful, it is changing the way issues are dealt with and is bringing greater voluntary willingness to minimize environmental impacts (Harding, 1996). On the other hand, the suggestion that NGOs have become the "public watch-dog" for environmental care (Sham Sani, 1999) may overstate the situation. Few groups have large memberships and much of the environmental activism originates in Penang, the small island that has seen rapid economic transformation because of its success as an electronics manufacturing base (see Gonzalez et al., 2000).

Environmental NGOs remain critical of the lack of enforcement and co-ordination of regulation (CAP and SAM, 1996), but government has shown an increased willingness to accept outside influence on environmental performance. When Austria became the first country to designate a quality mark for tropical timber and raised tariffs on its importation, as part of efforts to improve timber harvesting practices, it was Malaysia that promptly protested the measure to the GATT (Roht-Arriaza, 1995). The internationalization of Malaysian timber companies has brought a change of attitude. The Malaysia Minister of Primary Industry, who oversees the Malaysian timber industry, has stated that companies should follow basic guidelines of good corporate citizenship, including obeying national laws and not taking advantage of weak governments (Nordin cited in Sizer and Plouvier, 2000:97). Similarly, increased international criticism of its domestic forestry policies has also produced significant changes in attitude. A National Timber Certification Centre has been established and the government, in partnership with industry, has invested substantial resources to create the Malaysian Criteria and Indicators for Sustainable Forest Management, which is the basis for an independent third-party certification mechanism. Changes in business behaviour nonetheless appear to be slow to emerge. To date, just one Malaysian TNC is said to be making serious efforts to incorporate

sustainability principals in its forestry management, and even it continues to be subject to substantial criticism of its activities (Sizer and Plouvier, 2000:98).

Environmental performance of foreign TNCs in Singapore and Malaysia

A study of TNC environmental practices published in 1988 (ESCAP/UNCTC, 1988) included case studies of Singapore and Malaysia. These were based on small samples of TNCs and pre-date contemporary environmental expectations. Consequently a new survey of foreign-owned TNCs in Singapore and Malaysia was undertaken in 2000 to examine the extent and character of "voluntary" environmental action, as well as the motivations underpinning such action. The focus of the survey was on actions undertaken by the TNC in the host country, either Singapore or Malaysia.

The survey covered industrial establishments identified in a published business directory for which a present address and named contact could be obtained. Foreign-owned industrial activities were the focus of the survey, because it was thought that they would exhibit greater voluntary action than locally owned and service organizations. In Singapore, 400 questionnaires were mailed to environmental officers and other persons identified as responsible for environmental management in each organization contacted. This compares with 640 wholly foreign-owned establishments listed in the latest Census of Industrial Production (EDB, 1998). In Malaysia, 450 questionnaires were mailed to establishments listed in the KBD Dun Business directory for foreign companies in ASEAN.

There were 89 useable responses in Singapore, a 22.25 per cent response rate, and 91 useable responses in Malaysia, a 20 per cent response rate. The respondent organizations are broadly in line with the ownership distribution of foreign companies in the two countries, although non-Japanese Asian TNCs are underrepresented in the Malaysian responses (table 3). The responses from both countries were concentrated in three sectors: electronics, chemicals and chemical products, and fabricated metal products (table 4). The respondents also shared similar characteristics in terms of: (i) pollution intensity (predominantly being either of high or medium intensity); (ii) organizational size (predominantly being either small or medium-sized TNCs); (iii) nationality (around half are Asian respondents, and the United States or Europe account for a similar proportion of the remainder); and (iv) average age of capital (predominantly being either five to 10 years, or 11 to 15 years) (table 4). The capital age, pollution intensity and size characteristics may result in a low representation of organizations that are most exposed to environmental pressure, as large, old, polluting plants are not present. More generally, it must be expected that a postal survey of environmental performance is likely to gain fewer responses from those establishments with a poor environmental record. Consequently, without a much greater response rate, the surveys cannot claim to be representative of all TNCs in Malaysia and Singapore. Differences between respondents and the attributes of those claiming to be most active are the matters that we focus upon here.

Respondent organizations were classified according to the extent to which they had implemented the following actions: (i) set environmental performance standards above government regulations; (ii) allocated environmental responsibilities to senior managers; (iii) recently completed an environmental review of their establishment; (iv) produced an agreed environmental policy statement; (v) implemented an environmental management system; (vi) included environmental performance in the investment criteria for new technology; (vii) participated in community-based environmental projects; and (viii) taken steps to increase environmental awareness and responsibility among the workforce. Using these criteria, organizations were classified according to whether their environmental commitment is high, medium or low (figure 1).

Participation in at least six of the eight actions was needed to be classed as high, whereas low performers had not undertaken more than one of the actions. In the case of the last three listed criteria, various responses were possible, some of which indicate additional commitment above the minimum threshold. Such responses were used to identify high performers. These criteria and the range of responses are as follows.

- *Investment criteria*—High performers indicated one of two options relating to the priority given to environmental impacts in the selection of new technology: (i) best available environmental technology; and (ii) best available environmental technology not entailing excessive cost. Lower options were to select either: (i) environmental technology at a reasonable cost; and (ii) environmental technology sufficient to meet local regulations.
- *Community project participation*—Participation in any one of four types of community project was required, but with multiple participation possible for the most active organizations. These projects were (i) sponsoring a community event or environmental initiative; (ii) public reporting of their environmental impacts; (iii) dialogue with community groups or an NGO or both; and (iv) green labelling.
- *Workforce education/training*—Participation in at least three of seven types of workforce initiatives was required, again with the possibility that active organizations exceed the threshold. The initiatives were: (i) environmental training; (ii) environmental awareness orientation for new employees; (iii) display of environmental policy around the workplace; (iv) copy of an environmental policy given to each employee; (v) newsletter on environmental issues; (vi) environmental awareness events; and (vii) environmental suggestion scheme.

The criteria for high performance were at a comparatively low threshold compared with the environmentally most advanced corporations existing in older industrial countries. There is, for example, no reference to product stewardship, public information disclosure or the delegation of environmental responsibilities to all categories of employee. On the other hand, implementation of six or more of the actions identified suggests that an organization has made a consistent effort to raise its environmental performance. At the other end of the scale, it is clear that organizations classified as "low" are not participating in voluntary environmental initiatives. Organizations with environmental actions that bring immediate benefits, but without a strategic commitment to voluntary improvement, feature on the scale as medium-level organizations.

In both countries, medium performance accounted for almost half the respondents, but Malaysia had a larger share of high performers: 48 per cent versus 34 per cent in Singapore (figure 1). The difference in the share of high performers is statistically significant (chi square value = 8.851, df = 2, $p<0.05$), but additional evidence is required to determine the real extent of difference. Our indicators do not capture the extent of effort invested in individual actions and tell us nothing about the actual environmental impact of an organization. Moreover, as noted above, while generally it may be expected that active organizations will be overrepresented in the responses, there will also be variations in the response rate of low performers in some areas. In Singapore, where companies are under little community pressure to address environmental issues, inactive companies may be more willing to identify themselves than in Malaysia. The greater share of most active organizations in Malaysia keeps open the possibility that informal regulatory pressure from civil society organizations is encouraging more voluntary action in that country than Singapore, but the survey evidence alone does not confirm this.

Among high performers in both countries, all eight actions measured in the survey have strong participation. Medium performers exhibited participation in fewer actions and, in particular, not in actions that indicate an overall organizational commitment to accept a larger environmental responsibility, namely, setting environmental standards above regulatory requirements; participating in community environmental projects; workforce education; and (especially in the case of Malaysia) implementing an environmental management system. Low performers participate little in any actions, although they do recognize some environmental impacts in the technology selection and, in the case of Malaysia, will have completed an environmental review (which might be explained by EIA requirements).

A check was made on the classifications by comparing the distribution of expenditure in order to comply with environmental regulations, with expenditure on voluntary environmental programmes. When pollution intensity is taken into account, organizations classified as high performers are associated with a higher proportion of discretionary expenditure than other respondents (table 5). Some reliability may, therefore, be apportioned to the survey responses and classification of respondent organizations.

Explaining environmental commitment

Previous investigations of industry and environment in developing and newly industrializing economies have suggested a number of determinants of environmental performance at the establishment level (see World Bank, 2000, for reviews of recent studies). Drawing on that evidence, firms were cross-classified according to their environmental classification and a number of variables that were thought to potentially explain their classification (table 6). Overall it was found that few of the explanatory variables were associated with higher performance and that there were no consistent differences between Singapore and Malaysia.

In Singapore, employment size is linked, to some extent, to environmental effort, with the largest organizations tending to be more active (table 7). When the data is dichotomized into organizations with more or less than 1000 employees and those with high or other levels of environmental action, large organizations are more likely to implement the widest range of

actions (chi square value = 10.804, df = 1, $p<0.05$). A second, but not statistically significant correlation (chi square value = 1.164, df = 1, $p>0.05$) exists between nationality and likelihood of implementing environmental programmes. Whereas around a quarter of the total sample are high performers, the share among North American organizations increases to almost 44 per cent.

In Malaysia, the data indicate that neither employment nor ownership has an impact on performance. There is a statistically significant increase in environmental action among pollution-intensive respondents (chi square value = 4.590, df = 1, $p<0.05$). A sectoral bias in which chemicals, petroleum and fabricated metals generate the highest proportion of high performers is consistent with the impact of pollution intensity, but the small number of responses (5) claiming low pollution intensity precludes definitive conclusions from the survey evidence. Location has a small impact on performance, with establishments located near to residential areas having the largest share of high performers, but the participation is not significantly higher than that of establishments isolated from residential communities (chi square value = 6.631, df = 3, $p<0.10$). Similarly, establishments making finished products (implying a direct interface with consumers) are more likely to be high performers than those supplying industrial customers, especially where it is an internal customer, but again not to a significant degree (chi square value = 1.200, df = 1, $p>0.05$).

Motivation for voluntary action

Respondents were asked about the importance of a range of influences in encouraging voluntary action. Among the possible influences, pressure to conform to environmental criteria set by the corporate head office is most frequently given as the most important driver of voluntary action in both countries (table 8). Increased workforce environmental awareness is the second most frequently given influencing factor. Secondary influences were dispersed across the four possible options so that, overall, a diverse set of motivations encourages voluntary action. Although the spread of responses gives some confidence in their reliability, it must be acknowledged that environmental managers are more likely to identify internal drivers as the influences promoting voluntary action. External pressure may suggest that matters are somewhat outside their control and that credit for the benefits obtained cannot all be claimed by the organization. Below we offer a partial check on this by comparing the motives for action against the benefits claimed. It should be recognized, however, that this is an area that ultimately needs to be addressed through more detailed investigation.

Perceived benefits of voluntary action

Respondents were asked to rate the relative importance of the following possible benefits that might be obtained from their voluntary investment in environmental management: (i) market advantages because of enhanced reputation with consumers; (ii) cost savings; (iii) raised status of the plant within the corporate group; (iv) enhanced confidence in the environmental awareness of the workforce; (v) improved relations with regulatory agencies; (vi) reduced environmental liabilities; (vii) shareholder evaluation of the organization enhanced; and (viii) improved relations with the community, NGOs and media. The overall response indicates that the first three of these advantages are most frequently claimed in both Malaysia and Singapore

(figure 2). Other possible advantages are important for only a comparatively small proportion of organizations.

The establishments surveyed are typically a small part of a transnational organization, and might only be a minor influence on shareholder appraisal. Perhaps for this reason, enhanced confidence among shareholders is not identified as a main advantage. Interestingly, in Singapore, improved relations with regulators is more frequently cited than reduced environmental liabilities, whereas in Malaysia, environmental liabilities come out on top. An interpretation of this may be that the high visibility of operations in the small city-state, combined with the enforcement of regulation, reduces the likelihood of potential environmental liabilities. As noted above, limited resources for enforcement in a larger territory may permit poor practices to survive. In neither country is an improved image in the community cited frequently as the main advantage by more than a few respondents. On the other hand, when the second most important advantage is considered, a greater range of advantages is claimed in Malaysia than Singapore (figure 3). In Malaysia, an improved image in the community and improved relations with regulators are cited by a fifth of the respondents as the second most important advantage. These scores are consistent with the different conditions influencing formal and informal regulation in Malaysia and Singapore.

Of course, some caution is required in interpreting the factors respondents give as the main advantage of their environmental management. They may, for example, be reluctant to cite reduced liabilities as an advantage since this would be indicative of poor management practices in the past. On the other hand, there is a good correlation between organizations that supply final goods and those citing enhanced reputation with consumers as the key advantage. In Singapore, of 21 TNCs that see enhanced image with consumers as the key advantage, 13 manufactured final products. In Malaysia, 17 of the 29 TNCs were manufacturing final products. Some confidence in the result can be taken from the way that TNCs indicating improved reputation with customers as their main advantage from environmental action are also typically TNCs directly exposed to consumer pressure.

It is interesting to consider whether the advantages reported vary between those with high and low investment in environmental initiatives. The difference in the response between these two groups could suggest that there is more incentive in investing in environmental management, as it leads to distinct advantages achieved by high performers as compared to the low performers. The extent of difference can be examined in the case of Singapore, where there is a comparatively large share of low performers (figure 1). Cost saving is seen as the key advantage among organizations with high and low environmental commitment. The main differences relate to (i) the greater importance of an enhanced status within the corporate group for those with a high environmental commitment; and (ii) improved workforce awareness, which is seen as the key advantage (after cost saving) among organizations with low commitment (27 per cent as compared to 7 per cent in the case of organizations with high commitment) (figure 4). This statistic reflects how actions to raise the environmental awareness of the workforce are among the most frequent voluntary actions in low-commitment organizations.

The significance of improved corporate status in motivating organizations to increase their investment in environmental initiatives is open to alternative interpretations. When this advantage is not mentioned by respondents, it could be due to the lack of priority given to environmental performance, or to the branch's low performance (or to both situations). As a partial check on which explanation applies, the motivation for, and advantages obtained from, voluntary environmental initiatives were compared according to the extent of existing activity. Among existing high activity organizations in Singapore, 80 per cent indicate that conformity to the standards set by parent firms is the most important motivation for investment in environmental action, compared with 30 per cent for low-activity organizations. In Malaysia, two thirds of high performers were motivated by such standards, compared with none of the low performers. Thus it appears that most establishments belonging to organizations that are encouraging higher environmental standards have raised their performance, and their parent company recognizes this. A small group of establishments with similar corporate environmental interests have yet to take action and gain recognition. This, therefore, leaves a pool of organizations that might be expected to become active. On the other hand, a substantially increased level of participation will depend on corporate interest in environmental responsibility extending to more organizations, and for already active organizations to set higher standards for their branches than currently exist.

ISO14001 and environmental commitment

In Singapore, 37 respondents (41.5 per cent) had a certified environmental management system (two, EMAS; the rest, ISO14001) compared with 47 (51.6 per cent) in Malaysia. In Singapore, certified respondents comprised 82 per cent (18 of 22) of the organizations with most environmental action and 39.5 per cent (19 of 48) of the medium-level organizations. Corresponding figures for Malaysia were 84 per cent and 26 per cent. As would be expected, no organizations with low levels of action had a certified environmental management system.

By definition, certification implies that several of the other environmental actions examined in the survey are in place. While it may sometimes be associated with additional environmental action, it is important to note that two of the most substantial voluntary actions—adhering to environmental performance targets above regulatory requirements and incorporating environmental criteria in the selection of new investment—are not significantly more frequent among certified organizations than others. In addition, it is also worth noting that certification is not more prevalent among the most pollution-intensive organizations in Singapore. Of the 36 organizations in Singapore that indicated that a high degree of effort was required to comply with environmental regulation, 43 per cent have certification compared with 57 per cent of those with medium or low compliance effort. Similarly in Malaysia, where the respective proportions are 51 per cent and 49 per cent, pollution intensity does not appear to motivate certification.

Perceived market benefits seem to motivate organizations to obtain certification as compared with operating with a non-certified environmental management system (table 9). In both countries, an improved image with customers is more frequently cited as a motive among those with certification than those without, with cost savings being almost as important a

differentiating influence. Parent company instruction is an important reason for certification in both countries, although in Malaysia it is slightly less important than consumer image. In both countries, government agencies have actively encouraged certification, but it seems this has had most impact on encouraging the adoption of a non-certified management system.

Codes of conduct

A growing emphasis on business social responsibility and self-regulation is seen in the emergence of environmental codes of conduct. A code of conduct may be specified by a parent company for its affiliate operations, a multilateral organization for certain types of business, a buyer for its suppliers or an industry association for its members (Jenkins, 2000). In Malaysia, 30 of 91 respondents were covered by at least one code of conduct, with one third being affected by at least two codes. Almost three quarters of the organizations covered by a code of conduct were high performers. For all but one organization, at least one of their codes was set by the parent company, with customer or industry association codes the only other notable source. Given that enforcement of codes promoted by an independent party may be expected to be greatest, these results underline the limited importance of codes as an influence on our sample of TNC branches. Respondents in the chemical industry most frequently identified being covered by an industry association code, most probably Responsible Care. Customer codes existed among respondents in. the electronic and fabricated metals sectors. Of the 30 organizations that were covered by at least one code of conduct, 25 were from pollution-intensive sectors like chemicals and chemical products, fabricated metal products, rubber and natural resource-based products, and petroleum refining and petroleum products. Two organizations specified the OECD as the source of a code of conduct, but none identified other multilateral agencies as a source (table 10).

Conclusion

During the 1990s, voluntary self-regulation was promoted as a viable way of increasing business contributions to sustainable development. It was championed for its flexibility in addressing environmental issues and for the incentives it provided for environmental innovations, compared with compliance to uniform regulatory standards. Voluntarism became a popular idea among some international and government agencies, which came to see environmental regulations as stifling of industry competitiveness, costly to society and unhelpful to improving environmental performance. The review offered in these case studies of Singapore and Malaysia casts some doubt on the overall contribution that voluntary action may make. There are reasons to believe that interest in voluntary action will decline as companies fail to obtain the extent of economic or public relations benefits that may have been expected. Much of the case for voluntary action has been based on an exaggerated comparison with traditional forms of regulation, overlooking, for example, how these can be enforced with differing degrees of coercion and flexibility. The above analysis suggests that there is some scope to benefit from voluntary action in Singapore and Malaysia, but this is partly because there has been little pressure on companies to be proactive in these countries.

When TNCs are asked what motivates their investment in environmental initiatives, the most important driver identified is corporate pressure to standardize the environmental performance of affiliates in different foreign locations. This can be seen as a commitment to higher standards, although it is also a possible cost-saving means, by reducing the variability in management procedures and technology. Nonetheless, the general effect is to increase environmental responsibility in host economies, as TNC environmental policies typically encompass more activities than do formal regulations. The survey indicates that organizations coming under corporate pressure are the most active investors in environmental initiatives. Consequently, an important source of any increased participation will be corporate commitment to environmental improvement. This seems more influential than conditions in the host economy, either in the form of government or informal pressure. Although it is possible that some of the corporate interest comes from trends in affiliate locations, it is more likely that they are influenced by expectations in their home economies, where their customers and investors are located.

The survey has not confirmed the importance of several influences thought to be associated with corporate environmental commitment. Among the explanatory variables examined in the survey, size (as measured by employment) emerged as the only significant influence on environmental performance in Singapore. Larger organizations have taken the most action to increase their environmental responsibility; pollution intensity, market characteristics and dependence on brand images were found not to be important. The small size of the sample may affect the lack of association, but it is also suggestive of a context in which business regards regulatory compliance as sufficient performance in the absence of any community questioning of their environmental performance. On the other hand, high pollution intensity had a small impact in encouraging environmental action in Malaysia. This may be linked to less consistent enforcement of regulation in a larger and less well-resourced territory, as well as the greater risk of community action against environmental infringements than in Singapore. Some confirmation of this is given by the greater frequency of improved community relations as an advantage being gained from environmental action.

The small sample on which the survey is based makes it difficult to interpret the absence of expected influences on TNC environmental behaviour, but it does suggest that management preferences and organizational capacities to absorb higher environmental responsibilities are a significant influence that need consideration in future studies. Other research has, for example, found an association between "lean" manufacturing and green manufacturing: firms that are innovative in terms of their manufacturing processes are likely to be the most imaginative in addressing environmental costs and risks (Florida, 1996). Lean and green manufacturing, it is argued, utilizes essentially the same set of skills and procedures. These results imply that organizations may not be so much accepting new responsibilities as making full use of their innovation capacity.

Corporate commitment is the driver of environmental initiatives in Singapore, in the absence of other pressures. This means that caution needs to be exercised in assuming that corporate pressure is affecting all foreign affiliate locations. In the survey, the relatively limited

importance of improved standing in the community as a motivator for voluntary action is striking. This presumably reflects the limited attention paid by the Singaporean public or media to corporate environmental behaviour, reflecting confidence that government regulation is managing the issue and ensuring that organizations act responsibly. In addition, it needs to be recognized that the Singaporean operations are typically a small part of a transnational organization with limited capacity to influence investor appraisal, which might be a further motivation for voluntary action in the home country. Similarly, the strong enforcement of regulation in Singapore has reduced action motivated by the wish to reduce potential environmental liabilities.

The significance of the action taken by TNCs is difficult to assess without impact data, but the overall impression is that substantive activity is limited to a small proportion of organizations. The low participation in environmental initiatives may be criticized, but equally it can be seen to highlight the limited advantage that an organization gets from such investment. There has been a tendency in much of the literature to assume that corporate support of voluntary environmental initiatives should, and can, be adopted across all sectors. This overlooks how the possibility of and incentive for participation is likely to vary considerably between industries. Consumer interest in green products, for example, continues to vary highly. Goods such as washing detergents and certain types of packaging attract significant environmental concern, while clothing and computers, for example, remain less susceptible to green marketing. The Singaporean and Malaysian samples include a relatively large proportion of final good manufacturers. Although improved market standing through enhanced image among consumers is a fairly important motivation among these firms, it is not a prime motivator of action, nor a principle advantage obtained for the most active organizations.

In both Singapore and Malaysia, governments have seen ISO14001 as an important indicator of voluntary business commitment to environmental improvement. Based on the evaluation of environmental policies of certified organizations in Singapore, it was concluded that for the most part it is encouraging little additional activity. The survey of foreign transnationals tends to confirm that certification does not significantly encourage substantive voluntary actions. ISO14001 needs to be assessed differently in Malaysia, where pollution from "backyard" small industries remains a serious problem. For such firms, adoption of an environmental management system can stimulate important improvements in the absence of resources to ensure regulatory compliance.

At the present time, voluntary corporate environmental action cannot be seen as an effective substitute for government regulation. Commitments to prioritize environmental impacts in their investment decisions, or to ensure that all parts of an organization adhere to home-country standards, are limited to a minority of companies. Signs that some TNCs are adhering to performance standards above local regulatory requirements should be viewed as an opportunity to tighten regulation. In the absence of community interest in the environmental performance of business organizations, government-enforced upgrading of performance standards is important to reward those companies that invest ahead of regulatory requirements.

Table 1: Motives for, and constraints on, corporate greening

Motive	Action	Limitation
Strategic	Green marketing Clean technology	Consumer advantage Economic return Industrial modernization
Avoiding disadvantage	Certification Codes of conduct Supply chain relations	Public trust Industry commitment Legislation
Acting responsibly	Triple bottom line	Stakeholder management

Table 2: ISO 14001 certifications in Southeast Asia

Country	Number of certified organizations (July 2000)	Number expected by the end of 1999 based on ISO 9000 uptakes	ISO 14001 certifications as a ratio of GDP per capita (1997) x 1000
Malaysia	175	700	17.5
Singapore	87	120	3.0
Thailand	283	140	34.4
Indonesia	77	125	16.8
Philippines	53	100	16.0

Source: ISOworld, 2000; Tanner et al., 1997.

Table 3: Response profile and representation of the organizations

Ownership and sector	Respondents				All foreign-owned establishments			
	Singapore		Malaysia		Singapore		Malaysia[2]	
Ownership	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**	**Frequency**	**%**
Japan	38	42.7	38	41.7	304	36.4	263	23.7
Europe	25	28.1	18	19.8	179	21.4	146	13.2
USA	18	20.2	23	25.3	210	25.2	91	8.3
Other Asian	5	5.6	11	12.1	n.a.	n.a.	423	38.21
Others	3	3.4	1	1.1	140	16.3	184	16.62
Total	89	100.0	91	100.0	833	100.0	1107	100.00
Sector					**Singapore[1]**		**Malaysia[2]**	
Electronics	32	36.0	37	40.7	225	7.1	340	32.4
Chemicals and petrochemicals	20	22.5	17	18.7	567	18.1	97	9.3
Fabricated metals	18	20.2	17	18.7	631	20.2	130	12.4
Machinery and equipment	9	10.1	4	4.4	595	19.1	133	12.6
Others	10	11.2	16	17.5	1154	35.5	349	33.3
Total	89	100.0	91	100.0	3172	100.0	1049	100.0

Notes: [1] All local and foreign-owned establishments. [2] Investment projects approved in 1996 and 1997.

Source: EDB, 1998 (for Singapore); MIDA, 1997 (for Malaysia).

Table 4: Summary of respondent characteristics

Singapore

Pollution intensity (%)*		**Nationality of parent company (%)**	
High	40.5	Asia	48.5
Medium	47.0	USA	20.0
Low	12.5	Europe	28.0
		Others	3.5
Organization size (%)**		**Sector (%)**	
Large	14.5	Electronics	36.0
Medium	34.0	Chemicals and chemical products	20.0
Small	51.5	Food, beverages and tobacco	2.5
Average age of the plant (%)		Fabricated metal products	20.0
Less than 5 years	12.4	Machinery and equipment	10.0
5–10 years	31.5	Rubber and natural resource-based	1.0
11–15 years	28.1	Petroleum and petroleum products	2.5
16–20 years	14.6	Others	8.0
More than 20 years	13.5		

Malaysia

Pollution intensity (%)*		**Nationality of parent company (%)**	
High	39.5	Asia	54.0
Medium	55.0	USA	25.0
Low	5.5	Europe	20.0
		Others	1.0
Organization size (%)**		**Sector (%)**	
Large	11.0	Electronics	40.5
Medium	36.0	Chemicals and chemical products	15.5
Small	53.0	Food, beverages and tobacco	4.5
Average age of the plant (%)		Fabricated metal products	18.5
Less than 5 years	3.3	Machinery and equipment	4.5
5–10 years	45.1	Rubber and natural resource-based	7.5
11–15 years	25.3	Petroleum and petroleum products	3.5
16–20 years	15.4	Others	5.5
More than 20 years	11.0		

Singapore: N = 89; Malaysia: N = 91.

Notes: * Pollution intensity was measured according to the effort required to comply with environmental regulations.

** Organization size refers to the size of the parent company distinguished as follows:

	One or more of the following applies
Small TNC	1. Less than 500 employees in home country
	2. 1–5 affiliates in overseas locations
	3. Operations in no more than 3 countries
Medium-	1. Less than 500 employees in home country
sized TNC	2. 6–20 affiliates in overseas locations
	3. Operations in 4–10 countries
Large	1. More than 500 employees in home country
TNC	2. More than 20 affiliates in overseas locations
	3. Operations in more than 20 countries

Table 5: Reasons for environmental management expenditure among pollution-intensive organizations according to their environmental commitment

	Percentage of total environmental expenditure					
	Singapore			Malaysia		
Motivation for environmental expenditure	**Less than 25%**	**26–50%**	**51–100%**	**Less than 25%**	**26–50%**	**51–75%**
High commitment						
Regulatory compliance	2	8	0	2	4	11
Voluntary environmental action	0	4	6	3	7	6
Medium commitment						
Regulatory compliance	1	5	2	0	3	7
Voluntary environmental action	2	1	5	2	5	4
Low commitment						
Regulatory compliance	0	2	1	0	0	0
Voluntary environmental action	1	1	1	0	0	0

Table 6: Percentage distribution of firms by ownership, pollution intensity, location, size, type of product manufactured and sector

	Singapore		
	High	**Medium**	**Low**
		(% of respondents)	
Ownership			
Asia (N=43)	32.6	39.5	27.9
USA (N=18)	44.4	38.9	16.7
Europe (N=25)	28.0	64.0	8.0
Others (N=3)	33.3	66.7	0.0
Pollution intensity[1]			
Intensive (N=36)	41.7	30.6	27.8
Moderate (N=42)	23.8	64.3	11.9
Low (N=11)	45.5	38.4	18.2
Location			
Near to residential population (N=36)	27.8	50.0	22.2
Isolated from residential population (N=45)	35.6	46.7	17.8
Mixed residential and industrial population (N=8)	50.0	37.5	12.5
Size (employees)			
Less than 50 (N=14)	14.3	50.0	35.7
51–100 (N=22)	22.7	59.1	18.2
101–500 (N=34)	32.4	44.1	23.5
501–1000 (N=9)	44.4	55.6	0.0
More than 1000 (N=10)	80.0	20.0	0.0
Type of product manufactured			
Finished product (N=45)	35.6	42.2	22.2
Partly finished product for plants under same ownership (N=6)	50.0	50.0	0.0
Partly finished product for other manufacturers (N=29)	27.6	55.2	17.2
Mixed of above action (N=9)	33.3	44.4	22.2
Sector or type of activity			
Electronics (N=32)	43.8	46.9	9.4
Chemicals and chemical products (N=18)	27.8	50.0	22.2
Food, beverages and tobacco (N=2)	50.0	50.0	0.0
Fabricated metal products (N=18)	27.8	33.3	38.9
Machinery and equipment (N=9)	44.4	22.2	33.3
Others (N=10)	10.0	90.0	0.0
Age of technology			
Less than 5 years (N=11)	23.3	4.8	11.8
5–10 years (N=28)	20.0	35.5	41.2
11–15 years (N=25)	30.0	28.6	23.5
16–20 years (N=13)	13.3	14.6	17.6
More than 20 years (N=12)	13.3	16.7	5.9

Note: [1] Pollution intensity: refer to the definition under table 4.

Table 6 (continued)

	Malaysia		
	High	**Medium**	**Low**
		(% of respondents)	
Ownership			
Asia (N=49)	49.0	46.9	4.1
USA (N=23)	52.2	39.1	8.7
Europe (N=18)	38.9	55.6	5.6
Others (N=1)	0.0	100.0	0.0
Pollution intensity[1]			
Intensive (N=36)	61.1	36.1	2.8
Moderate (N=50)	38.0	56.0	6.0
Low (N=5)	40.0	40.0	20.0
Location			
Near to residential population (N=52)	55.8	38.4	5.8
Isolated from residential population (N=21)	42.9	57.1	0.0
Mixed residential and industrial population (N=17)	23.5	64.7	11.8
Isolated from residential and industrial community (N=1)	100.0	0.0	0.0
Size (employees)			
Less than 50 (N=1)	0.0	100.0	0.0
51–100 (N=6)	50.0	33.3	16.7
101–500 (N=38)	39.5	55.3	5.3
501–1000 (N=17)	52.9	47.1	0.0
More than 1000 (N=29)	55.2	37.9	6.9
Type of product manufactured			
Finished product (N=47)	57.4	38.3	4.3
Partly finished product for plants under same ownership (N=9)	22.2	77.8	0.0
Partly finished product for other manufacturers (N=26)	46.2	46.2	7.7
Mixed of above action (N=9)	22.2	66.7	11.1
Sector or type of activity			
Electronics (N=37)	45.9	45.9	8.1
Chemicals and chemical products (N=14)	64.3	35.7	0.0
Food, beverages and tobacco (N=4)	25.0	75.0	0.0
Fabricated metal products (N=17)	64.7	23.5	11.8
Machinery and equipment (N=4)	25.0	75.0	0.0
Others (N=15)	33.3	66.7	0.0
Age of technology			
Less than 5 years (N=3)	2.3	2.3	20.0
5–10 years (N=41)	46.5	41.9	60.0
11–15 years (N=23)	27.9	25.6	0.0
16–20 years (N=14)	9.3	20.9	20.0
More than 20 years (N=10)	14.0	9.3	0.0

Table 7: Environmental commitment and employment size in Singapore

Environmental commitment	Number of employees				
	Less than 50	**51–100**	**101–500**	**501–1000**	**More than 1000**
High	2	5	11	4	8
Medium	7	13	15	5	2
Low	5	4	8	0	0
Total	14	22	34	9	10

Table 8: Influences (other than regulation) motivating environmental action

Influences for voluntary action	Most important influence			
	Singapore		Malaysia	
	Frequency	**%**	**Frequency**	**%**
Corporate head office environmental criteria	40	45.5	44	48.4
Community, NGOs and media	7	8.0	9	9.9
Consumers (located in high-income economies)	18	20.5	21	23.5
Workforce	18	20.5	34	37.4

Note: Respondents: N (Singapore) = 89; N (Malaysia) = 91.

Table 9: Motivation to implement an environmental management system (EMS)

Motivation*	Certified EMS				Non-certified EMS			
	Singapore		Malaysia		Singapore		Malaysia	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Required by the corporate head office	32	86.5	38	80.9	17	81.0	7	58.3
Cost savings	28	75.7	37	78.7	10	47.6	6	50.0
Enhanced image among consumers	28	75.7	42	89.4	9	42.9	8	66.7
Improved relations with government regulating agencies	14	37.8	25	53.2	9	42.9	6	50.0
Improved relations with community, NGOs and media	13	35.1	29	61.7	4	19.0	7	58.3
Encouragement by host government	10	27.0	11	23.4	10	47.6	5	41.7
Number of organizations	**37**		**47**		**21**		**12**	

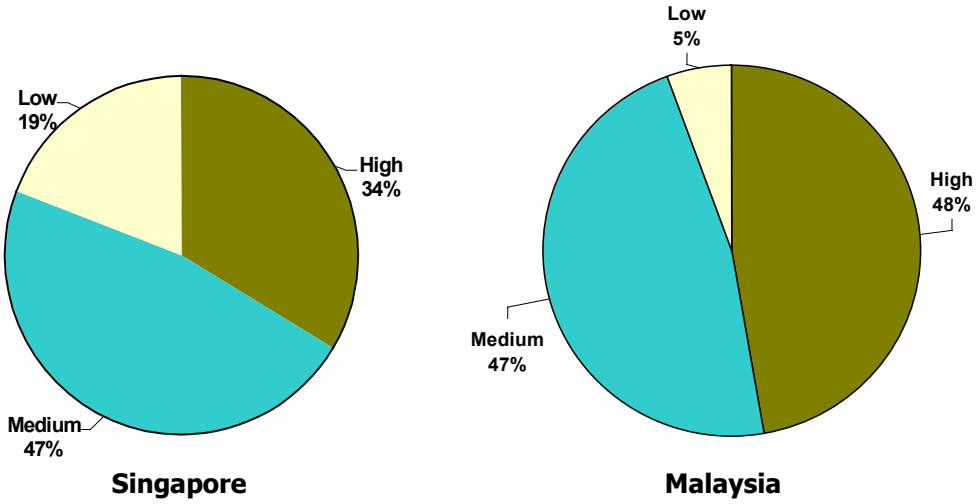
* Respondents can provide multiple motives

Table 10: Distribution of the type of environmental code of conduct followed by the respondents in Malaysia

Source of code of conduct	Number of respondents
Parent company	29
Customer	7
Industry or trade associations	7
OECD	2

Note: N = 30

Figure 1: Environmental Action among TNCs in Singapore and Malaysia



High: 6–8 environmental actions

Medium: 2–5 environmental actions

Low: one or none of the environmental actions

	Singapore (% of respondents)			Malaysia (% of respondents)		
Environmental action	**High**	**Medium**	**Low**	**High**	**Medium**	**Low**
Environmental standards above government regulations	76.7	28.6	5.9	65.1	32.6	0.0
Allocation of environmental responsibility to senior managers	76.7	63.4	0.0	93.0	51.4	0.0
Environmental review completed within 5 years	100.0	88.1	17.6	100.0	97.7	40.0
Environmental policy statement agreed	100.0	78.6	17.6	97.7	76.7	0.0
Implemented environmental management system	100.0	66.7	0.0	93.0	44.2	0.0
Environmental criteria included in new technology investment	83.3	57.1	58.8	86.0	62.8	60.3
Participation in or sponsoring of community-based environmental projects	73.3	16.7	11.8	62.8	16.3	0.0
Workforce education and training	96.7	45.2	11.8	93.0	25.6	0.0

Figure 2: Main advantage from investment in voluntary environmental initiatives in Singapore and Malaysia

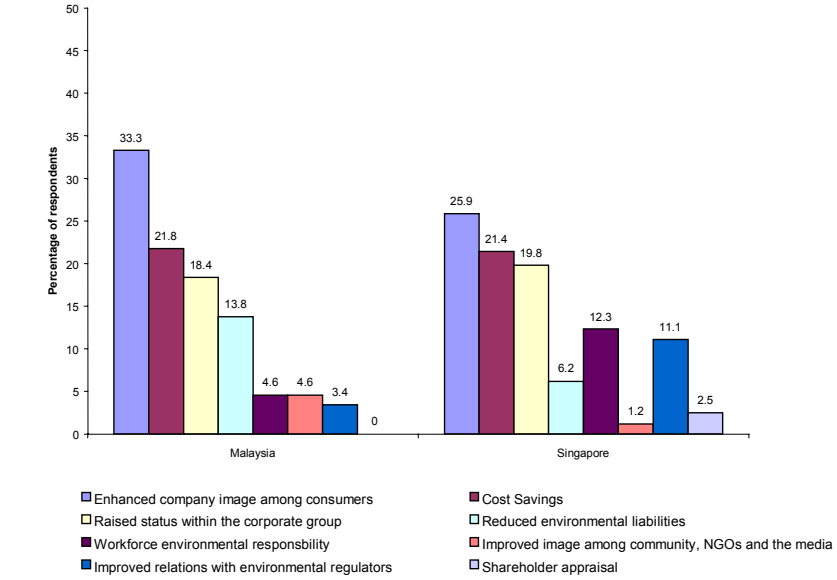


Figure 3: Second main advantage from investment in voluntary environmental initiatives in Singapore and Malaysia

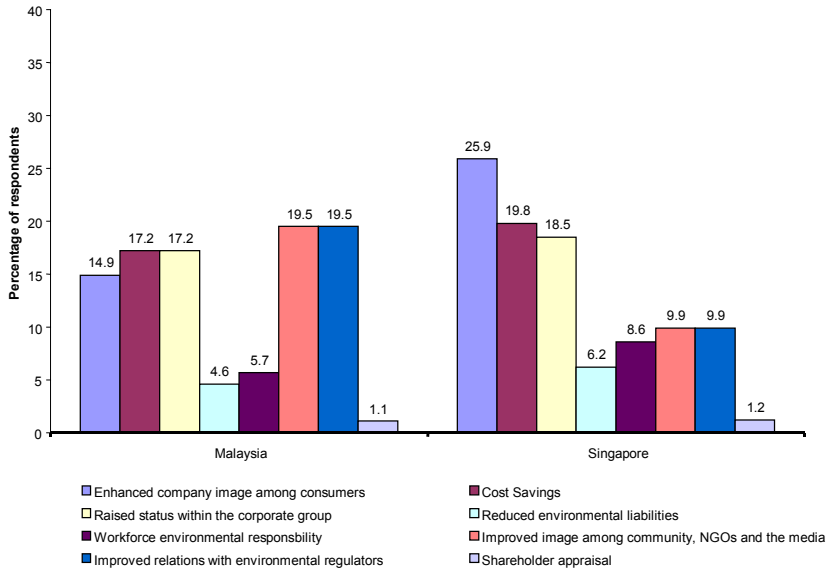
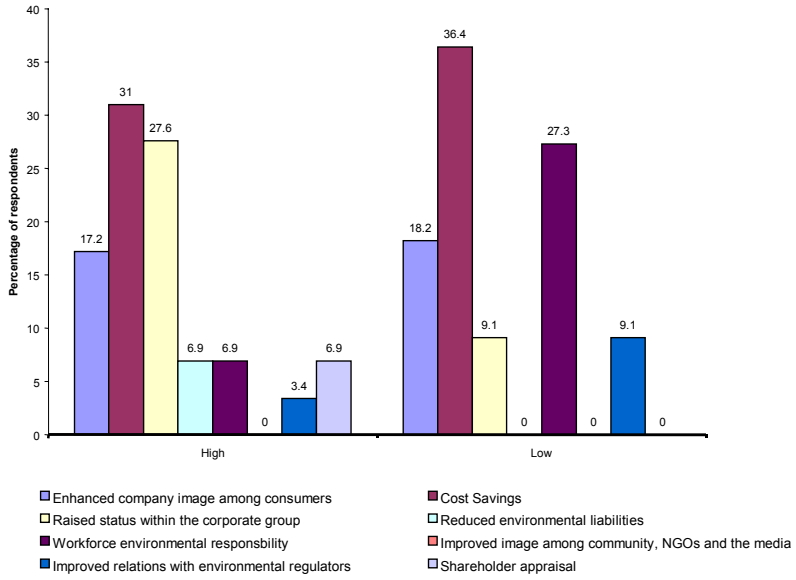


Figure 4: Main advantage from investment in voluntary environmental initiatives by high and low performers in Singapore



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